Fred. Olsen Renewables

Paul's Hill II Wind Farm

Volume 2: Environmental Statement

April 2018

CONTENTS

PREFACE

An Environmental Statement (ES) has been prepared in support of an application submitted by Natural Power Consultants (Natural Power) on behalf of the applicant Paul's Hill II Limited. The application seeks consent under Section 36 of the Electricity Act 1989 and the ES has been prepared in accordance with the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000 as amended. The application also seeks a direction under Section 57(2) of the Town and Country Planning (Scotland) Act 1997 as amended that planning permission for the development be deemed to be granted.

This ES contains the information relating to the Environmental Impact Assessment to develop a wind farm comprising of up to seven turbines and associated infrastructure (the proposed development). The proposed development is located approximately 5 km west of Upper Knockando in the Moray Council area.

The Environmental Statement and application may be viewed at the following address:

Moray Council

Elgin Council Offices

High Street

Elgin

IV30 1BX

This is Volume 2 of 4, of the ES. This volume contains the written statement on the findings of the environmental impact assessment.

Other volumes include:

Volume 1 of the ES presents a Non-Technical Summary (NTS) of the proposed development.

Volume 3 of the ES presents all figures and visualisations.

Volume 4 of the ES presents the technical appendices of the ES Chapters.

The ES is also supplemented by accompanying documents including a Planning, Design and Access Statement and Pre-Application Consultation (PAC) Report.

Copies of the full Environmental Statement and Non-Technical Summary can be obtained from Natural Power, Ochil House, Springkerse Business Park, Stirling, FK7 7XE. Tel: 01786 542300.

Non-Technical Summary in printed form	£10
Environmental Statement in printed form (Volumes 1-4)	£822
Environmental Statement in PDF file format on CD or Memory Stick (Volumes 1-4)	£10

An electronic copy (accessible free of charge) of the Environmental Statement can also be found on the Fred. Olsen Renewables website: https://fredolsenrenewables.com/windfarms/pauls-hill-ii/

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Document history

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Approved	Euan Hutchison	22/02/2018

Client Details	
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Client Name	Paul's Hill II Limited
Address	c/o Fred. Olsen Renewables Ltd, 2nd Floor 64-65 Vincent Square, London, SW1P 2NU, United Kingdom

Issue	Date	Revision Details
A	27/02/2018	First Draft
B	27/03/2018	Final Draft

Chapter 1

Introduction

Contents

Glossary

Term	Definition
Environmental Impact Assessment	Environmental Impact Assessment (EIA) is a means of drawing together, in a systematic way, an assessment of the likely significant environmental affects arising from a proposed development
Environmental Statement	A document reporting the findings of the EIA and produced in accordance with the EIA Regulations
The Existing Paul's Hill Wind Farm	The 'existing Paul's Hill Wind Farm' refers to the operational Paul's Hill Wind Farm.
The Proposed Development	The proposed Paul's Hill II Wind Farm
The Proposed Development Area	Red line boundary (application area)

List of Abbreviations

Abbreviation	Description
ECU	Energy Consents Unit
EIA	Environmental Impact Assessment
ES	Environmental Statement
FORL	Fred. Olsen Renewables Ltd
LVIA	Landscape and Visual Impacts Assessment
NTS	Non-Technical Summary
PAC	Pre-Application Consultation

1.1 INTRODUCTION

1.1.1 This Environmental Impact Assessment report has been prepared in support of an application under Section 36 of the Electricity Act 1989 to construct and operate the proposed Paul's Hill II Wind Farm (the proposed development) comprising of up to 7 wind turbines consisting of 6 turbines of an overall height from base to tip not exceeding 149.9 m and 1 turbine of an overall height from base to tip not exceeding 134 m, external transformer housing, site tracks, crane pads, foundations, underground electricity cables, substation control building, temporary construction and storage compounds, 2 borrow pits, associated works/infrastructure and Health and Safety signage (see Chapter 4: Description of Development of the ES).

1.1.2 The application has been submitted by Natural Power Consultants (Natural Power) on behalf of the Applicant, Paul's Hill II Limited. This ES accompanies an application letter (the 'application') submitted to the Energy Consents Unit (ECU) for consent to develop a wind farm compromising of up to 7 wind turbines and associated infrastructure (the 'proposed development').

1.1.3 The proposed development is located south west of Elgin on the hills of Carn na Dubh-chlais, approximately 5 km west of Upper Knockando in the Moray Council area, and will be an extension to the adjacent existing Paul's Hill Wind Farm.

1.1.4 Figure 1.1 in Volume 3 of the ES shows the regional context of the proposed development including the existing Paul's Hill Wind Farm.

1.1.5 Figure 1.2 in Volume 3 of the of the ES shows the location and site layout of the proposed development. The application site is located east of the existing Paul's Hill Wind Farm and is centred on British National Grid Coordinates of 311746E and 840863N respectively.

1.1.6 Figure 1.3 in Volume 3 of the ES shows the proposed development, alongside the existing Paul's Hill Wind Farm, in the proposed development area.

1.1.7 The existing Paul's Hill Wind Farm is located approximately 5 km west of Upper Knockando in Moray and commenced operation in May 2006, consisting of 28 turbines with a maximum height of 100 m to tip and a rated output of 64.4 MW.

1.1.8 The proposed development will act as an extension to the existing Paul's Hill Wind Farm and will utilise the existing infrastructure on site, as far as is practical.

1.1.9 This document describes the natural and human environment of the area within which the proposed development would be situated. It describes details of the construction, operation and decommissioning phases, and assesses the potential effects that the development would have on the natural environment and on human interests. It also describes the policy context for renewable energy within Scotland and the UK, and the overall policy context as set out by international agreements to reduce emissions of climate change gases, and targets set for the growth of renewable energy generation.

1.2 APPLICATION DETAILS

1.2.1 The application is submitted in accordance with:

- The Electricity Act 1989; and
- The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000 and Amendment Regulations 2008.

1.2.2 The application seeks consent under Section 36 of the Electricity Act 1989. The application also seeks a direction under Section 57(2) of the Town and Country Planning (Scotland) Act 1997 as amended that planning permission be deemed to be granted.

1.2.3 The full scoping report was submitted to the ECU on the 5th of May 2017. A copy of this can be found in Appendix 1.1 in Volume 4, of the ES. The full scoping opinion was received from the ECU in August 2017. This can be found in Appendix 1.2 in Volume 4, of the ES.

1.2.4 As the Scoping Report was submitted prior to 16th May 2017, the ES will be submitted under the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000 and Amendment Regulations 2008. The ES will however include a chapter on the impact on human health and population in accordance with the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017.

1.2.5 It is proposed that, as far as is practical, the planning conditions that applied to the Paul's Hill Wind Farm consent in 2004 (see Appendix 1.3 in Volume 4 of the ES) should also be applied to the proposed development. This will ensure that there is, in general, duplicate sets of similar conditions applying to the wind farm as a whole with the new set recognising the use of shared infrastructure for the lifetime of the new phase of development. Reference is made throughout the ES to specific planning conditions in the original planning consent where it is considered that these could be applied to the proposed development.

1.3 APPLICANT

1.3.1 The Applicant, Paul's Hill II Limited (Table 1.1), is a subsidiary company of Fred. Olsen Renewables Ltd (FORL). FORL have been developing and operating wind farms since the mid 1990's and is fully committed to the Scottish and UK renewable energy generation market, with an operational portfolio generating capacity of 507.5 MW. In the UK FORL have a total of six operational wind farms, including the existing Paul's Hill Wind Farm and nearby Rothes Wind Farm, also in Moray.

1.4 PROJECT TEAM

1.4.1 The project has been designed and assessed by the Applicant in association with their lead consultants, Natural Power (Table 1.2). Natural Power has been appointed to coordinate and produce this ES and associated EIA documentation.

1.4.2 Natural Power has been providing expertise to the renewable energy industry since the company was formed in 1995 and is one of the UK's leading wind farm consultants. As well as development and EIA services, Natural Power also provide expert advice and due diligence consultancy, site construction management and site operation and maintenance.

1.4.3 Natural Power currently employs over 300 people working full time providing renewable energy services nationally and internationally. Natural Power's office in Stirling, where this project is largely managed, currently employs approximately 100 renewable energy experts. Contact details of other consultants involved in the production of the ES are provided in Table 1.3.

Table 1.1: Details of the Applicant

APPLICANT	
Paul's Hill II Limited	Registered Address: c/o Harper Macleod LLP, The Ca'd'oro, 45 Gordon Street, Glasgow, G1 3PE Contact Address: c/o Fred. Olsen Renewables Ltd, 2nd Floor 64-65 Vincent Square,

APPLICANT		
	London, SW1P 2NU	Tel: 0207 963 8904 *Contact: Gareth Swales*

Table 1.2: Details of agent and lead consultancy

AGENT, LEAD WIND ENERGY AND PLANNING CONSULTANCY		
Natural Power Consultants	Ochil House, Springkerse Buisness Park, Stirling, FK7 7XE	Tel: 01786 542 300 *Contact: Craig Potter*

Table 1.3: Other consultants involved in the production of this Environmental Statement

CONSULTANTS		
PHOTOGRAPHY CONSULTANCY		
Leeming Paterson Photography	Glenhoul Brae Dalry Castle Douglas DG7 3UB	Tel: 01664 430004 *Contact: Morag Paterson*
CULTURAL HERITAGE CONSULTANCY		
CFA Archaeology Ltd	Old Engine House, Eskmills Park, Musselburgh, East Lothian, EH21 7PQ	Tel: 0131 273 4380 *Contact: George Mudie*
NOISE CONSULTANCY		
Hayes McKenzie Partnership Ltd	Unit 3, Oakridge Office Park, Whaddon, Salisbury, Wiltshire, SP5 3HT	Tel: 01722 710 091 *Contact: Rob Shepherd*

1.5 STRUCTURE OF THE ENVIRONMENAL STATEMENT

1.5.1 The ES contains the findings of the assessment of the likely environmental effects of the proposed wind farm and comprises the following volumes:

- Volume 1: A Non-Technical Summary (NTS) of the proposed development.
- Volume 2: A written statement on the findings of the Environmental Impact Assessment.
- Volume 3: All ES Figures.
- Volume 4: Technical Appendices of the ES chapters.

1.5.2 Separate documents have also been produced in support of the application including a Planning, Access and Design Statement and a Pre-Application Consultation (PAC) Report.

1.5.3 An outline of Volume 2 is presented below:

- Chapter 1: Introduction, of the ES, provides a brief introduction of this document and the application.
- Chapter 2: Policy Context, of the ES, identifies the energy and land use policy and outlines the need for the proposed development and its benefits within the context of international climate change agreements and European, UK and Scottish renewable energy policy.
- Chapter 3: Site Selection and Design Evolution, of the ES, provides a detailed description of the site selection process for the proposed site. This chapter also discusses the design evolution process and mitigation measures that were introduced at the site selection and design stage to reduce environmental impacts.
- Chapter 4: Description of Development, of the ES, provides a detailed description of the proposed development including details of the construction, operational and decommissioning arrangements.
- Chapter 5: Approach to ES, presents a methodology for environmental design and assessment of the proposed development through gathering baseline environmental data, mitigation of impacts during site design and final assessment of the significance of residual environmental and human effects of the proposal.
- Chapter 6: Landscape and Visual Assessment, of the ES, provides an assessment of the Landscape and Visual Impacts (LVIA) of the proposed development and cumulative LVIA.
- Chapter 7: Ecology Assessment, of the ES, provides an overview of the baseline ecological conditions relating to the habitats and (non-avian) fauna present within the proposed development area and immediate surrounding environment.
- Chapter 8: Ornithology Assessment, of the ES, describes the ornithological interest at the proposed development and assesses the predicted effects on these interests.
- Chapter 9: Cultural Heritage Assessment, of the ES, considers the potential impacts of the proposed development upon cultural heritage assets.
- Chapter 10: Hydrology, Geology and Hydrogeological Assessment of the ES, assesses the impacts on the hydrological, geological and hydrogeological environment at the proposed development.
- Chapter 11: Aviation and Existing Infrastructure, of the ES, assesses the potential for impact upon aviation, Ministry of Defence (MoD) interests, communication operations and existing site infrastructure and demonstrates the consulting process undertaken and outlines mitigation where it is deemed necessary.
- Chapter 12: Traffic and Transport Assessment, of the ES, assesses the effects due to transport and access resulting from the construction, operation and decommissioning of the proposed development.
- Chapter 13: Human Health and Population, of the ES, assesses the predicted socio-economic and tourism impacts of the proposed development. It will also assess the findings of the construction and operational noise assessments that were carried out to assess the noise impact of the proposed development. This chapter also considers shadow flicker and ice throw.

- Chapter 14: Summary, residual effects (inc. synergistic effects) and mitigation, of the ES, summarises the findings of the Environmental Impact Assessment (EIA) presented in the ES chapters described above.

Document history

Author	Kirstin Leckie	12/09/2017
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Chapter 2

Policy Context

Contents

Glossary

Term	Definition
Environmental Statement	A document reporting the findings of the EIA and produced in accordance with the EIA Regulations
The Existing Paul's Hill Wind Farm	The 'existing Paul's Hill Wind farm' refers to the operational Paul's Hill Wind Farm
The Proposed Development	The proposed Paul's Hill II Wind Farm
The Proposed Development Area	The project development area within the red line boundary

List of Abbreviations

List and describe your abbreviations here.

Abbreviation	Description
AR6	The Sixth Assessment Report
CO_2	Carbon Dioxide
ES	Environmental Statement
IPCC	Intergovernmental Panel on Climate Change
LDP	Local Development Plan
MIR	Main Issues Report
NPF	National Planning Framework
PAN	Planning Advice Notes
RES	The UK Renewable Energy Strategy
RO	The Renewables Obligation
SG	Supplementary Guidance
SHEP	Scottish Historic Environment Policy
SPP	Scottish Planning Policy
UNFCCC	United Nations Framework Convention on Climate Change

2.1 INTRODUCTION

2.1.1 This chapter of the Environmental Statement (ES) identifies and contextualises the policy and legislative framework relevant to the development of renewable energy. It is recognised that current drivers to these policies have emerged from the pressing concerns regarding climate change and the resulting aims of reducing greenhouse gas emissions. Renewable energies are acknowledged within these as a means to reduce greenhouse gas emissions through a reduced reliance upon fossil fuels.

2.1.2 The chapter also gives due consideration to the Scottish Energy Strategy (2017) and the associated Scottish Onshore Wind Energy Policy Statement (2017). Both of these documents duly recognise that the economic landscape for onshore wind turbine development changed following the announcement of the removal of subsidies in 2015, and therefore if onshore wind is to remain a viable form of energy generation wind turbine typologies will need to become larger (taller in overall height with larger rotors).

2.1.3 This chapter additionally recognises the relevant development plan policies against which the application for the proposed development is likely to be assessed.

2.1.4 It is not the purpose of this chapter to analyse the proposed development against the policy. Detailed analysis of the proposed development is contained within a separate Planning, Design and Access Statement, which supports the application. This statement contains a brief description of the proposed development, the rationale for the proposal, a summary of the findings of the Environmental Statement (ES) and consideration of the application against key legislative requirements. It also contains consideration of the proposed development against UK and Scottish Government policy requirements, assessment of the application against the relevant development plan policies, assessment of the effects of other material considerations, and the conclusions reached on the planning issues raised by the proposed development. It does not form part of the assessment within the ES.

2.2 CLIMATE CHANGE (CONTEXT, POLICY AND LEGISLATION)

Climate Change Background

2.2.1 It is widely recognised and accepted that climate change is a pressing and real phenomenon. The Intergovernmental Panel on Climate Change (IPCC) has, to date, published three Working Group (WG) reports. The Sixth Assessment Report AR6 is currently in the Scoping Stage and is due to be published in 2021.[1]

2.2.2 The European Community as a whole will meet its overall target of at least 20 % of energy consumption from renewable sources by 2020. Against this EU target, the Directive establishes a requirement for the UK to achieve an equivalent target of 15 % by 2020. A press release (37/2014)[2] issued by Eurostat on 10th March 2014, notes that in 2012 the UK was only achieving 4.2 %. Against this same background, only Luxembourg and Malta recorded lower percentage levels than the UK in 2012. By comparison, Sweden, Latvia and Finland were achieving 51 %, 35.8 % and 34.3 % respectively in 2012. As of 2012, Estonia, Bulgaria and Sweden have achieved their 2020 targets.

2.2.3 Under the Kyoto Protocol, adopted by the Annex 1 participating countries in 1997, and European policy, each member state is required to enact policy to deliver their emissions reduction targets.

2.2.4 The Paris Agreement is an agreement within the UNFCCC dealing with greenhouse gas emissions, mitigation adaption and finance starting in the year 2020. Under the Paris Agreement, the UK will be required to produce plans and regularly report its own contribution that it should make in order to mitigate. There is no mechanism to force a country to set a specific target by a specific date, but each target should go beyond previously set targets.

[1] Available at: https://wg1.ipcc.ch/AR6/AR6.html (accessed 18/09/2017)

[2] Eurostat press release, available at: http://ec.europa.eu/eurostat/documents/2995521/5181358/8-10032014-AP-EN.PDF/91350d4a-4b57-4833-b9f0-32cfe0a6d360 (accessed 02/02/2018)

Climate Change Act 2008 and Climate Change (Scotland) Act 2009

2.2.5 The Climate Change Act 2008 received Royal Assent on 26 November 2008. Considered as a ground breaking piece of legislation, the Act introduced legally binding targets on the Secretary of State to move towards a low carbon economy and to reduce the UK's net greenhouse gas emissions by at least 80 % below 1990 levels by 2050 and updated in 2009 to achieve CO_2 reductions of at least 34 % from electricity below 1990 levels by 2020.

2.2.6 The Climate Change (Scotland) Act 2009 is seen as a key commitment of the Scottish Government, and contains environmental legislation that is the most far-reaching considered by the Scottish Parliament during its first ten years of devolution. The aim of the Act was to establish a framework to drive greater efforts at reducing Kyoto Protocol greenhouse gas emissions in Scotland. The Act created mandatory climate change targets to achieve a reduction in Scotland's greenhouse emissions by at least 80 % below 1990 levels by 2050 and an interim target of 42 % by 2020.

2.3 RELEVANT UK RENEWABLE ENERGY POLICIES

Past UK Renewable Energy Governance

2.3.1 The following policies guided renewable energy development in the UK pre 2015:

- The UK Renewable Energy Strategy (2009)
- The UK Renewable Energy Roadmap (2013)
- The Carbon Plan
- Levy Control Framework
- The Renewables Obligation
- Contracts for Difference

2.3.2 Following the announcement of closure of the Renewable Obligations Scheme to onshore wind in 2015 the UK entered a transitional period into a market where reliance on subsidies was no longer an option to finding solutions to make onshore wind farm developments financially viable.

Renewable Energy in the Post Subsidy Market

2.3.3 Following the announcement of closure of the Renewables Obligation scheme to onshore wind in 2015 it has broadly been accepted that there must be a change made to facilitate onshore wind farm developments.

2.3.4 In this new transitional shift between onshore wind being reliant on subsidies to having none, there is a need to recognise the benefits new larger typology wind turbines can bring, with wider rotor diameters and taller in height. These turbines increase efficiency and maximise the use of the available wind resource, and also reduce the turbine numbers per unit area of land. This movement towards larger turbines is now being reflected in all renewable energy policy, such as in the Scottish Energy Strategy, as discussed in section 2.4 below. This is vital in helping Scotland, and the UK, meet their renewable energy targets.

2.4 RELEVANT SCOTTISH RENEWABLE ENERGY POLICIES

In the past, renewable energy had been guided in Scotland by the 2020 Route Map for Renewable Energy in Scotland and the Renewables Action Plan (2009) as well as the UK policies and guidance mentioned above. Following this, after being in line to meet the ambitious targets it presented, the Scottish Energy Strategy emerged in 2017 to guide the future development of energy in Scotland. This strategy was accompanied by the 2017 Onshore Wind Policy Statement.

Scottish Energy Strategy

2.4.1 The Scottish Energy Strategy was published in December 2017. The strategy takes the next step and introduces additional targets, for the energy system by 2030, to those of the 2020 Route Map for Renewable Energy in Scotland and the Renewables Action Plan, including the aim to produce 30 % of Scotland's whole energy demand from renewable sources by 2020, as the country moves towards these targets being met.

2.4.2 It is estimated that 17 GW of installed renewable capacity will be required by 2030 for these targets to be met. The installed capacity of renewables in Scotland was 9.5 GW in June 2017. The ambitious but achievable target of generating 50 % of Scotland's energy demand for heat, transport and electricity has the potential to be produced by renewable resources by 2030.

A 2050 Vision

2.4.3 Scottish Energy Strategy (2017)[3] outlines a vision for energy production in Scotland for 2050. The vision is centred on achieving a strong, low carbon economy in which renewable energy and Scotland (which contributed 18% to the UK's low carbon sector in 2014 generating £5.6 billion) play an important part.

2.4.4 It sets new targets to produce the equivalent of 50 % of Scotland's heat, transport and electricity consumption by renewable sources by 2030, with the ambition of a system wide approach towards energy production and to increase the productivity of energy use across the Scottish economy by 30 %.

2.4.5 The strategy recognises Scotland's potential with the renewable energy industry rapidly growing in the country. Scotland is a substantial contributor to both UK and EU energy systems. It has great potential to help meet both national and local energy targets. Scotland currently contributes 60 % towards the UK's onshore wind capacity.

2.4.6 In 2015, 42 % of Scotland's electricity production was from renewables.

Scotland's Changing Energy System

2.4.7 The strategy recognises there is an ongoing trend in Scotland's energy system. There has recently been a rapid growth in harnessing the country's renewables resources, making for a largely decarbonised electricity supply. This has contributed greatly in helping achieve the target to produce 100 % of the country's electricity demand from renewable sources by 2020.

2.4.8 Building on this success, it is the aspiration to continue this change in the energy system and begin to tackle decarbonising heat and transport sectors to meet the country's updated energy and climate change targets. Renewables have an important role to play in this in a shift away from the use of and reliance on fossil fuels in energy production, as well as energy efficiency. This is essential in helping the Scottish Government meet the set energy and climate change targets and become an energy leader.

2.4.9 It is stated that renewable energy sources supply almost 18 % of final energy consumption in Scotland, which is almost a 10 % rise since 2009.

Renewables and Scotland's Economy

2.4.10 The strategy recognises that the renewables industry has been a key economic driver within Scotland's Economy. In 2015, an estimated 58,500 jobs were supported by Scotland's low carbon and renewable energy sector and supply chain. Moreover, Scotland is now a key contributor to innovations in renewable energy technology.

2.4.11 The strategy claims that onshore wind is a key component in Scotland's industrial opportunities. In 2015, it has been estimated that the sector supported 7,500 jobs in Scotland, generating more than a £3 billion turnover.

[3]Available at: http://www.gov.scot/Resource/0052/00529523.pdf (accessed 22/01/2018)

Scottish Onshore Wind Energy Policy Statement

2.4.12 The Scottish Onshore Wind Energy Policy Statement further recognises the sector is a big contributor to the Scottish economy. Scotland has 46 % of all UK employment in the sector and 57 % of all UK turnover in the sector.

2.4.13 The Scottish Government seeks to use its devolved powers to invest in appropriately sited onshore wind developments.

2.4.14 The Policy Statement recognises that the future of the market for onshore wind is uncertain following the removable of subsidies in 2015. However, it is believed this can be facilitated with the right regulatory framework and Government support.

2.4.15 The Scottish Government states it will support new and repowered wind farms. This support includes a recognition that if wind farms are to be viable in a post subsidy world this inevitably means the use of larger turbines, where appropriately located, and that such wind turbines can capture more of the available wind resource and improve the efficiency of wind turbine developments. With the necessary support for such large turbine projects by Scottish Ministers, statutory and non statutory consultees the ambitious 2030 energy targets can be met.

2.5 LEGISLATION

The Electricity Act 1989

2.5.1 As the proposed development is an extension to the existing Paul's Hill Wind Farm, which was a Section 36 development, the scheme requires consent from the Scottish Government under Section 36 of The Electricity Act 1989. The application also seeks deemed planning permission granted by the Scottish Government under Section 57 (2) of the Town and Country Planning (Scotland) Act 1997. Although the consenting authority in this instance is therefore the Scottish Government, Schedule 8 of the Act requires the relevant local planning authorities are consulted on planning matters.

2.5.2 The requirements of Schedule 9 of the Act, which is concerned with the preservation of amenity and fisheries, are applied to applications for consent under Section 36 of the Electricity Act 1989. Pursuant of Schedule 9 of the Act, regard is given to the desirability of preserving natural beauty, conserving flora and fauna and geological or physiographical features of special interest and of protecting sites, buildings and objects of architectural, historical or archaeological interest and the Scottish Government will consider the extent to which that Applicant has done, within reason, what they reasonably can to mitigate any effect the proposal might have on these features. There is also a requirement when exercising relevant functions related to the generation or supply of electricity to seek to avoid, so far as reasonably practicable, causing injury to fisheries or fish stocks.

2.5.3 These matters have been addressed in this ES and assessments of these features have been undertaken and are described along with a summary of the proposed mitigation measures in the relevant chapters of the ES to mitigate potential environmental effects upon these assets.

The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000 and Amendment Regulations 2008

2.5.4 Regulation 3 states that a Section 36 consent application which requires an EIA shall not be granted unless the requirements of the regulations have been satisfied. This in turn requires the Applicant to submit an ES that the proper publicity procedures have been followed and the secretary of state has taken the findings of the ES and other environmental information into account.

2.5.5 New regulations came into force on the 16th of May under The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017. Although the application is submitted under the regulations prior to these, the ES will contain a chapter on Human Health and Population which is a requirement of the new regulations. This can be found in Chapter 13 of the ES.

Energy Act 2008, Energy Act 2011, Energy Act 2013 and Energy Act 2016

2.5.6 The Energy Act 2011 extends and amends existing powers in the Energy Act 2008. It received Royal Assent on 18 October 2011 and aimed to help increase investment in energy efficiency, improve energy security and enable investment in low carbon energy supplies in the UK. The regulatory bodies and regulatory mechanisms were restructured slightly, conferring more powers on Ofgem. The Act also imposed duties on the market to report future needs as much as possible.

2.5.7 The Energy Act 2013 received Royal Assent on 18 December 2013. This series brings together all of the department's documentation for the Energy Act. These provisions enable the Secretary of State to set a 2030 decarbonisation target range for the electricity sector in secondary legislation.

2.5.8 The Energy Act 2016 received Royal Assent on the 12th of May 2016.

The Planning Acts

2.5.9 The request that planning permission be granted deemed planning consent Is governed by Section 57 (2) of the Town and Country Planning (Scotland) Act 1997, which provides that:

"On granting a consent under section 36 or 37 of the Electricity Act 1989 in respect of any operation or change of use that constitutes development, the Secretary of State may direct that planning permission for that development and any ancillary development shall be deemed to be granted, subject to such conditions (if any) as may be specified in the direction."

2.6 NATIONAL PLANNING POLICY AND ADVICE

National Planning Framework 3 (NPF3)

2.6.1 The Planning etc. (Scotland) Act 2006 amended the 1997 Act to put NPF on a statutory footing. The third edition of National Planning Framework (NPF3) was published in June 2014[4]. It sets out a strategy for Scotland's development over the next 20 to 30 years, providing a national context for development plans and planning decisions, to inform wider programmes of government, public agencies and local authorities.

2.6.2 NPF3 confirms the importance of renewable energy to Scotland's energy mix and highlights upgrades to the electricity transmission system infrastructure that are needed to facilitate this development. The vision for Scotland portrayed in NPF3 is that of a successful, sustainable place, a low carbon place, a natural resilient place and a connected place. These visions put emphasis on the aspirations of Scotland being a leader in low carbon energy generation, both onshore and offshore, to create a more energy efficient environment with less greenhouse gas emissions. The target is to generate the equivalent of Scotland's gross annual electricity consumption from renewable sources by 2020.

2.6.3 The energy sector is a key focus in Scotland's Economic Development Strategy, with recognition given to the importance of emerging renewable energy technologies. NPF3 states in paragraph 3.6 that the renewables industry currently supports around 11,000 jobs in Scotland and paragraph 3.9 states the Government's intention to maintain this:

"security of supplies and addressing fuel poverty remain key objectives. We want to continue to capitalise on our wind resource, and for Scotland to be a world leader in offshore renewable energy. In time, we expect the pace of onshore wind energy development to be overtaken by a growing focus on our significant marine energy opportunities, including wind, wave and tidal energy".

[4] Available at: http://www.gov.scot/Resource/0045/00453683.pdf (last accessed 18/10/2017).

2.6.4 NPF3 takes a stronger, more prescriptive stance regarding spatial development of onshore wind, stating in paragraph 3.23 that:

"Onshore wind will continue to make a significant contribution to diversification of energy supplies. We do not wish to see wind farm development in our National Parks and National Scenic Areas. Scottish Planning Policy sets out the required approach to spatial frameworks which will guide new wind energy development to appropriate locations, taking into account important features including wild land."

2.6.5 NPF3 also states importance of community ownership in renewable energy and aims to deliver 500 MW of renewable energy in community and local ownership by 2020 and increase benefits in commercial scale developments.

2.6.6 NPF is a material consideration and assessment of the proposed development against NPF3 is provided in the Planning Statement.

Scottish Planning Policy

2.6.7 The latest SPP[5] was published in June 2014 and is a statement of Scottish Minister's priorities and will be a material consideration for determining this application.

2.6.8 SPP highlights that the planning system is essential to achieving the Scottish government's central purposes of increasing sustainable economic growth, with regard to principles of sustainable development as outlined in the Planning etc. (Scotland) Act 2006. Decisions made through the planning system should, amongst other things, contribute to the reduction of greenhouse gas emissions in line with the commitment to reduce emissions by 42 % by 2020 and 80 % by 2050, contribute to reducing consumption and to the development of renewable energy generation opportunities. This need to tackle climate change is recognised as a principle challenge of sustainable economic growth.

2.6.9 The latest SPP also introduces a presumption in favour of development that contributes to sustainable development, however to achieve the "*right development in the right place"* development plans, policies and decisions that consider onshore wind should:

- Give due weight to net economic benefit and respond to economic issues, challenges and opportunities, as outlined in local economic strategies;
- Support the delivery of energy infrastructure;
- Support climate change mitigation and adaption;
- Have regard to the principles for sustainable land use set out in the Land Use Strategy[6]; and
- Avoid over-development and protect the amenity of new and existing development.

2.6.10 Other principles affecting the determination of applications include the protection and enhancement of the cultural and natural environment, including biodiversity and landscape; maintain, enhance and promote access to open space and recreation opportunities; and to take into account the implications of development for water, air and soil quality.

2.6.11 The new SPP states that the planning system should "*take every opportunity to create high quality places by taking a design-led approach*". The SPP aims to achieve this through the use of a "*holistic approach that responds to and enhances the existing place while balancing the costs and benefits of potential opportunities over the long term*". This holistic approach considers the relationships between the four outcomes of the new SPP:

- A successful, sustainable place;
- A natural, resilient place;
- A connected place; and
- A low carbon place.

2.6.12 Those subject policies that are relevant to this application are outlined below.

A Successful, Sustainable Place

2.6.13 The SPP recognises the importance of supporting sustainable economic growth and regeneration, setting out the role that the Scottish Government expects the planning system to play in the sustainable economic growth of Scotland.

Rural Development

2.6.14 The overall approach advocated in the SPP is that of a proactive stance to development in rural areas. The Planning System should:

- *"In all rural and island areas promote a pattern of development that is appropriate to the character of the particular rural area and the challenges it faces"*; and
- *"Encourage rural development that supports prosperous and sustainable communities and businesses whilst protecting and enhancing environmental quality".*

2.6.15 These themes are also to be found in 'A Forward Strategy for Scottish Agriculture' published in 2001 and in the subsequently published *'Forward Strategy for Scottish Agriculture: Next Steps'* published in March 2006.

Valuing the Historic Environment

2.6.16 The SPP supports the recognition of the contribution made by cultural heritage to our economy, cultural identity and quality of life and describes the historic environment as a "*key cultural and economic asset and a source of inspiration that should be seen as integral to creating successful places*". As such the planning system should:

- Promote the care and protection of designated and non-designated historic environments and their contribution to sense of place, cultural identify, social well-being, economic growth, and education;
- Change should be sensitively managed to avoid or minimise adverse impacts on the fabric and setting of designated and non-designated historic environments and ensure their character is protected, conserved or enhanced; and
- Those non-designated historic assets and areas of historic interest (historic landscapes, other gardens and designated landscapes, woodlands, etc.) should also be protected and preserved as far as possible, in situ wherever feasible.

A Low Carbon Place

2.6.17 Scottish Renewable Energy Targets outline the national targets set for Scotland's electricity to be generated from renewable sources. It makes clear that Planning Authorities should support the development of renewable energy technologies, guide development to appropriate locations and provide clarity on the issues that will be taken into account when specific proposals are assessed. The targets require development plans to support all scales of energy development to ensure that an area's renewable energy potential is realised and to make clear factors that will be taken into account in decision making.

2.6.18 The energy and climate change policies referred to above are discussed within the SPP as part of the planning system. The SPP states that the planning system should:

"Support the transformational change to a low carbon economy, consistent with national objectives and targets" and

[5] Scottish Planning Policy, available at: http://www.scotland.gov.uk/Publications/2014/06/5823 (accessed 02/02/2018)

[6] Land Use Strategy, available at: http://www.scotland.gov.uk/Topics/Environment/Countryside/Landusestrategy (accessed 18/10/2017).

"Support the development of a diverse range of electricity generation from renewable energy technologies – including the expansion of renewable energy generation capacity"

2.6.19 Within A Low Carbon Place', a sub-section relating to onshore wind specifies that:

"Planning authorities should set out in the development plan a spatial framework identifying those areas that are likely to be most appropriate for onshore wind farms as a guide for developers and communities".

2.6.20 An approach to spatial framework is provided within the SPP which should be followed "*in order to deliver consistency nationally*". The SPP spatial framework is made up of three groups.

2.6.21 Group 1 are areas where wind farms will not be acceptable, these areas are made up of National Parks and National Scenic Areas.

2.6.22 Group 2 are areas of significant protection where wind farms may be appropriate in some circumstances. Consideration will be required where proposed developments are to be located within these areas to "*demonstrate that any significant effects on the qualities of these areas can be substantially overcome by siting, design or other mitigation*". Group 2 areas include National and International designations such as National Nature Reserves and Sites of Special Scientific Interest, Other nationally important mapped environment interest areas such as areas of wild land are included in this group and those areas not exceeding 2 km around cities, towns and villages identified on the local development plan with an identified settlement envelope or edge.

2.6.23 Group 3 are areas with potential for wind farm development which includes all areas beyond Groups 1 and 2. Within these areas "*wind farms are likely to be acceptable, subject to detailed consideration against identified policy criteria*". The proposed development therefore lies within a Group 3 area.

2.6.24 The 2014 SPP differs in the weighting of landscape capacity studies as it was recognised in the draft SPP that planning authorities had prepared landscape assessments which also include local designations on top of the national designations and the relative weight being applied to the numerous landscape designations had become confused[7]. As such the 2014 SPP has included locally designated sites as potential areas for wind energy.

Circulars

2.6.25 Circulars contain guidance on policy implementation through legislative or procedural change which may be material considerations to be taken into account in development management decisions. Relevant Circulars which may be considered in regard to wind farm developments include:

- Circular 3/2013 – Development Management Procedures[8].
- Circular 3/2009 – Notification of Planning Applications[9].

Planning Advice Notes (PANs)

2.6.26 A number of Planning Advice Notes (PANs) have been considered during the evolution of the project.

2.6.27 Consideration of PAN 1/2013: Environmental Impact Assessment[10] which replaces PAN 58 has been made to ensure the ES produced for the proposed development is proportionate and fit for purpose. It must be noted that this does not apply under the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017.

2.6.28 Specific Advice Sheet: Onshore Wind Turbines[11] has replaced PAN 45 – Renewable Energy. It acts as a web-based, and regularly updated, source of specific advice for the development of onshore wind farms. It recognises substantial growth and increasing diversity in project scale. It also considers how wind farm development may have landscape impacts. This considers how a wind farm development may affect the landscape character. It pays particular attention to a landscape's ability to absorb development. It provides guidance for what to consider when proposing developments. The document recognises the potential impact wind farm development may pose to radar and civil and military aviation flight paths. It provides advice that consultation should be made, where constraints have been identified.

2.6.29 The Onshore Wind Turbines advice sheet discusses the potential noise issues deriving from wind turbine operation. The document refers to several guidance documents including ETSU-R-97. The specific advice sheet acknowledges the advancements in noise reduction related to wind turbine operation and refers to the criteria outlined in ETSU-R-97 as the means to assess proposals. This is considered in full in Chapter 13: Human Health and Population. Table 2.1 presents other relevant PANs.

Table 2.1: Other Relevant PANs

Other Relevant PANs	Details
PAN 51 – Planning and Environmental Protection[12]	Published in October 2006 and supports existing policy on the role of the planning system in relation to the environmental protection regimes.
PAN 60 – Planning for Natural Heritage[13]	Provides advice on how development and the planning system can contribute to the conservation, enhancement, enjoyment and understanding of Scotland's natural environment and encourage developers and planning authorities to be positive and creative in addressing natural heritage issues.
PAN 68 – Design Statements[14]	Published in August 2003 and explains the design statement process.
PAN 73 – Rural Diversification[15]	Defines diversification as helping to broaden the economic activity of rural areas, providing opportunity and creating a more balanced and stable economy. It is suggested that one of the means by which planners can support rural diversification is by addressing issues of accessibility, infrastructure, scale and design.
PAN 75 – Planning for Transport[16]	Published in August 2005 and aims to provide guidance for improving transport integration with new developments.
PAN 3/2010 – Community Engagement[17]	Published in August 2010. It provides guidance for interacting with the public appropriately and early in the planning process.
PAN 1/2011 – Planning and Noise[18]	Published in March 2011. It includes information about noise from wind turbines and links to web based planning advice specifically for Onshore Wind Turbines. This document provides advice on *'The Assessment and Rating of Noise from Wind Farms'* (ETSU-R-97) published by the former Department of Trade and Industry and the

[7] Draft SPP, available at: http://www.scotland.gov.uk/Publications/2013/04/1027 (accessed 18/10/2017)

[8] Available at: http://www.scotland.gov.uk/Publications/2013/12/9882 (accessed 18/10/2017)

[9] Available at: http://www.gov.scot/Publications/2009/03/27112705/0 (accessed 18/10/2017)

[10] Available at: http://www.scotland.gov.uk/Publications/2013/08/6471/downloads#res432581 (accessed 19/10/2017)

[11] Onshore wind turbines, available at: http://www.scotland.gov.uk/Resource/0044/00440315.pdf (accessed 19/10/2017)

[12] Available at: http://www.gov.scot/Publications/2006/10/20095106/0 (accessed 19/10/2017)

[13] Available at: http://www.gov.scot/Publications/2000/08/pan60-root/pan60 (accessed 19/10/2017)

[14] Available at: http://www.gov.scot/Publications/2003/08/18013/25389 (accessed 19/10/2017)

[15] Available at: http://www.gov.scot/Publications/2005/02/20638/51727 (accessed 19/10/2017)

[16] Available at: http://www.gov.scot/Publications/2005/08/16154453/44538 (accessed 19/10/2017)

[17] Available at: http://www.gov.scot/Publications/2010/08/30094454/0 (accessed 19/10/2017)

[18] Available at: http://www.gov.scot/Publications/2011/02/28153945/0 (accessed 19/10/2017)

Other Relevant PANs	Details
	findings of the Salford University report into Aerodynamic Modulation of Wind Turbine Noise.
PAN 2/2011 – Planning and Archaeology[19]	Replaces PAN 42 and sits alongside SPP, Scottish Historic Environment Policy (SHEP) and the Managing Change in the Historic Environment Guidance Notes. PAN 2/2011 includes advice on the handling of archaeological matters within the planning process. For monuments scheduled under the Ancient Monuments and Archaeological Areas Act 1979 there are specific controls for works set out by SHEP and managed by Historic Scotland.

2.7 DEVELOPMENT PLANS AND OTHER LOCAL POLICY

Moray Local Development Plan 2015

2.7.1 The development plan for the proposed development area is the Moray Local Development Plan (2015)[20].

2.7.2 As the statutory presumption in terms of the development plan under the Planning Acts does not apply either to the Section 36 determination or the grant of any deemed planning permission, which differentiates the determination of an application under Section 36 from the determination of a planning application made under the Planning Acts, there is no requirement for the determination to be made in accordance with the development plan unless material considerations indicate otherwise. Notwithstanding, it is acknowledged that as the application seeks approval for a form of development, the relevant provisions of the development plan are relevant considerations in relation to the Section 36 determination process but it is for the decision maker to determine the weight to be attached to each of the relevant considerations, which would inevitably include the relevant provisions of the development plan.

2.7.3 The key policy requirements of the Moray Local Development Plan (LDP) are discussed in the following paragraphs. Further consideration of the assessments contained within this report against this policy is set out in the Planning Statement which accompanies the application.

2.7.4 The Moray Local Development Plan was formally adopted on 31st July 2015 and set out to guide future developments and land uses within towns, villages and rural areas within the constituency. It also gives guidance on where development should and should not happen.

2.7.5 The LDP provides a planning framework for the future use and development of land within the Moray Council Area and creates a base on which to guide the location of future developments, alongside setting out development opportunities and ways that enhance both the urban and rural environments. The LDP will be kept under review and is due to be updated in 2020. The primary policies of the LDP aim to:

- Promote sustainable economic growth;
- Help combat climate change by reducing greenhouse gas emissions and promote the shift towards a low carbon economy; and
- Create a sense of place within the urban and rural environment.

2.7.6 The LDP seeks to consider opportunities for renewable energy generation and supports the aims of tackling climate change.

2.7.7 The LDP contains policies regarding economic development with the overarching aim to control development in sensitive areas. It recognises that the planning process can create conditions which support economic growth; sustain and create jobs; and contribute to the wellbeing and prosperity of the area.

2.7.8 The LDP supports rural business proposals in which the council supports economic development by aiming to sustain employment in rural areas. Account will be taken of environmental consideration, including the impact on natural and built heritage designations and appropriate natural environmental protection. There will be careful consideration over site selections and site designs as well as the landscape and visual impacts of the proposed rural developments.

2.7.9 The LDP contains policies on protection of the natural environment. In particular, these include the protection of habitats, species and landscapes of international, national and local importance in order to protect and enhance biodiversity and the natural environment. It also seeks to integrate land and water policies and enhance the quality of the water environment. The policies also consider developments which may have an effect on the Cairngorms National Park Authority, National Scenic Areas and on areas of Great Landscape Value.

2.7.10 The LDP states that developments that lie within the vicinity of RAF Lossiemouth airfields should not impact upon the safe operation of these facilities.

Moray Local Development Plan Main Issues Report 2017

2.7.11 The Main Issues Report (MIR)[21] was published in preparation for the new Moray Local Development Plan which is due to be adopted in 2020. The opportunity to engage was made available until the 2nd of March 2018.

2.7.12 The MIR outlines a 'vision' for the future of Moray. Within this vision, sustainable development, low carbon and efficient use of land are encouraged. Supporting this vision, a policy is proposed to promote zero and low carbon technologies.

Moray Supplementary Guidance – Onshore Wind Energy

2.7.13 The LDP is supported by the supplementary guidance (SG) document Moray Onshore Wind Energy Supplementary Guidance (2017).

2.7.14 The document recognises national energy policy and guidance, as well as the national planning policy, Scottish Planning Policy (2014).

2.7.15 The guidance outlines:

- The Council's approach to considering and determining planning applications and for making observations on development proposals to the Scottish Government;
- Information requirements and issues to be addressed at pre-application and application stages;
- The Council's overall strategy for wind turbine development, including spatial framework and detailed policy guidance maps for three typologies of turbine development; and
- Links to the extensive range of detailed guidance produced by the Council and consultees, and contact details.

2.7.16 The guidance also aligns itself with Policy ER1 – Renewable Energy Proposals from the Moray LDP. The policy states that "all renewable energy proposals will be considered favourably where they meet the following criteria:

- They are compatible with policies to safeguard and enhance the built and natural environment;
- They do not result in the permanent loss or damage of agricultural land; and
- They avoid or address any unacceptable significant adverse impacts including:

[19] Available at: http://www.gov.scot/Resource/Doc/355385/0120020.pdf (accessed 19/10/2017)

[20] Available at: http://www.moray.gov.uk/moray_standard/page_100458.html (accessed 18/10/2017)

[21] Available at: http://www.moray.gov.uk/downloads/file117303.pdf (accessed 17/01/2018)

- Landscape and visual impacts;
- Noise impacts;
- Electromagnetic disturbance;
- Impact on watercourse engineering;
- Impact on peatland hydrology;
- Traffic impact;
- Ecological impact; and
- Impact on tourism and recreational interests."

2.7.17 In addition to this policy, the guidance outlines further considerations:

- A spatial framework, outlining areas of significant protection and areas with potential for onshore wind development.
- Detailed consideration of proposed developments including landscape and visual impacts; cumulative impacts; impact on local communities; any impacts on aviation radar; impact on the environment; impact on biodiversity; impact on cultural heritage; impacts on tourism and recreational activities and key scenic routes, and, impacts on woodlands.

2.7.18 In summary, the guidance outlines Moray Council's strategy to safeguard its high quality and diverse natural and built environment from developments which are not appropriate. It states the number of already consented wind farms in the area are contributing positively towards meeting national renewable energy generation goals, and that there is limited scope for further large scale developments. There are however some limited opportunities for extensions to existing wind farms in certain landscapes in Moray. The proposed Paul's Hill II Wind Farm, as an extension to Paul's Hill is therefore considered an appropriate development in the proposed location.

2.7.19 The proposed development is located in landscape character type 11 – Open Rolling Uplands. The document states that there is some scope for turbines up to 150 m within this landscape. In developing, the guidance states cumulative effects to be aware of:

- Adding to the prominence of turbines in the skyline of existing wind farms;
- Sequential and simultaneous views with other developments within this character type;
- Cumulative impacts on the minor Dallas – Knockando road; and
- Sequential and simultaneous views from the A940, a scenic route over the Dava Moor.

2.7.20 The guidance also provides a checklist to guide developers as to whether their development complies with the guidance.

Moray Wind Energy Landscape Capacity Study 2017

2.7.21 The 'Moray Wind Energy Landscape Capacity Study' which was published in May 2017[22]. It replaces the Moray Wind Energy Landscape Capacity Study published in 2012.It forms an appendix of the supplementary planning guidance document, to the Moray LDP, Onshore Wind Energy.

2.7.22 A relevant influence on Moray Onshore Wind Energy Guidance in the future is the SNH revision of the Landscape Character Assessment for Moray. This is anticipated to be published in the next few months.

2.7.23 The Moray Wind Energy Landscape Capacity Study describes the 'Open Rolling Uplands' landscape character type which only occurs in one single area within Moray. The area in which the proposed development is considered sensitive to wind farm developments with turbines over 50 m in height.

2.7.24 The Moray Wind Energy Landscape Capacity Study states that there is some limited scope for further wind energy developments within this area due to the presence of the operational wind farms Paul's Hill and Berry Burn.

2.7.25 Section 17.2 of the document states that *"while the large scale and generally simple landform of this character type reduces sensitivity to larger typologies, the presence of operational wind farms and the limited extent of this landscape limits the scope for further development"*. The landmark hills of Roy's Hill and Knock of Braemoray also constrain the scope for development due to their prominence and their current role in separating operational developments.

2.7.26 The Moray Wind Energy Landscape Capacity Study rates the sensitivity to very large typologies of wind turbines (>130 m) to be high-medium. This is rated lower than medium typologies of wind turbines (50 – 80 m) due to the characteristics of the current operational wind farms Berryburn, Paul's Hill and Hill of Towie, and their potential close indivisibility and potential cumulative impacts which are already visible from settlements and roads.

2.7.27 According to the author of the study, the constraints to development within this landscape characteristic are the potential cumulative impacts and the surrounding landscape characteristic, including skylines. The opportunities highlighted for development include the simple nature of the landform and the large scale of interior plateau areas, sparsely settled nature and the less visible eastern parts of the character type.

2.7.28 The guidance for development within this area states in section 17.3 that in the authors view there is some very limited scope for development identified for turbines of approximately 150 m in height. Development should avoid being sited on or nearby landmark hills as to not impact on views, including smaller scale, more complex landforms. The document also suggests that the minor road between Dallas and Knockando should be considered. On this route, turbines should be set back from the diverse moorland and regenerating woodland which provides an attractive feature to the route. Turbines should be sited as to minimise cumulative impacts from other operational wind farms and consented wind farms in key views.

Moray Supplementary Planning Guidance – Climate Change

2.7.29 Supplementary Planning Guidance was published alongside the Moray Local Development Plan in 2015. The Supplementary Guidance for Climate Change[23] outlines recommended guidance to follow when planning developments in relation to tackling the global problem of climate change on a local level through the means of sustainability.

2.7.30 The guidance is in keeping with the Scottish Government's set renewable energy production targets, outlined in the sections above, as well as Scottish Planning Policy (2014).

Energy Efficiency and Renewables

2.7.31 Included in this section is an energy hierarchy. Included in this hierarchy is the use of renewable energy technologies. This reflects what is said on the use of renewable energy technologies in the Moray Local Development Plan (2015). The guidance states that there needs to be a shift away from the reliance on energy produced from finite fossil fuel sources.

2.7.32 Low and zero carbon generating technologies are encouraged within Moray with the overarching aim to create a low carbon place.

2.7.33 Wind turbines are considered a key renewable energy technology within the guidance. It states that these should be sited on an area with a good wind resource which is free of obstructions. Ideally, they should be situated in wide open spaces.

[22] Available at: http://www.moray.gov.uk/downloads/file114216.pdf (accessed 18/10/2017)

[23] Available at: http://www.moray.gov.uk/downloads/file99685.pdf (accessed 18/01/2018)

Moray Economic Development Strategy

2.7.34 The Moray Economic Development Strategy (2012)[24] was produced by the Moray Community Planning Partnership. It provides a long term economic diversification strategy for the Moray area. A key theme of this is a strategy to develop renewable energy locally.

2.7.35 Within the strategy, the economic potential offered by renewable energy is considered under the area's strengths and opportunities. The strategy aims to support Scotland in developing a diverse, world-leading renewable energy sector.

2.7.36 The strategy states that the area has the potential to be home to business development in both the renewable energy and low carbon sectors. A reduction in greenhouse gas emissions leads to the opportunity for economic growth in rural communities.

Cairngorms National Park Authority

2.7.1 The proposed development is not located within the boundary of the Cairngorms National Park area; it is located approximately 7 km from the outer boundary. The wind farm is however visible from the park and has the potential impact upon views from within the Cairngorms National Park area and potentially have an impact upon some of its Special Qualities. In this respect the Cairngorms National Park Authority have expressed an interest in the proposed development and are therefore considered to be a statutory consultee as the neighbouring authority.

Cairngorms National Park Partnership Plan 2017-2022

2.7.2 The new Cairngorms National Park Partnership Plan came into effect in 2017[25] and it describes policies derived to help the Park with the challenges it is likely to encounter over the next 5 years. The plan's vision is to achieve "*an outstanding National Park, enjoyed and valued by everyone, where nature and people thrive together.*" The partnership plan is approved by Scottish Ministers.

2.7.3 The Cairngorms National Park shares four aims with Scotland's National parks which are included in the National Parks (Scotland) Act 2000 in a sustainable development approach. These are:

- *"To conserve and enhance the natural cultural heritage of the area;*
- *To promote sustainable use of the natural resources of the area;*
- *To promote understanding and enjoyment (including enjoyment in the form of recreation) of the special qualities of the area by the public; and*
- *To promote sustainable economic and social development of the area's communities."*

2.7.4 More specifically, Scotland's National Parks help deliver the following national priorities:

- To contribute to delivering climate change mitigation;
- Encouraging biodiversity;
- Serving as Scotland's nature capitals, linking nature to the economy;
- Serving as inclusive places for everyone, locals and visitors, to enjoy;
- To provide outdoor access infrastructure under the Active Scotland identity;
- To provide community empowerment through local development and regeneration; and
- To achieve sustainable economic growth.

2.7.5 The plan describes three main desired long-term outcomes for the Cairngorms National Park. These are:

- *"Conservation: A special place for people and nature with natural and cultural heritage enhanced;*
- *Visitor Experience: People enjoying the Park through outstanding visitor and learning experiences; and*
- *Rural Development: A sustainable economy supporting thriving businesses and communities."*

Within these three main desired long term outcomes for the National Park are 9 priorities under which policies fall, designed to help achieve these desired long term outcomes.

2.7.6 The first priority is to support landscape scale collaboration with the long term desired outcome to create a special place for people and nature with enhanced natural and cultural heritage. This priority falls under the conservation policy framework. Policy 1.3 under this priority aims to "conserve and enhance the special landscape qualities with a particular focus on conserving and enhancing wildness qualities; maintaining and promoting dark skies; enhancements that also deliver habitat improvements; enhancing opportunities to enjoy and experience the landscapes of the Park; and applying a presumption against new constructed tracks in open moorland."

2.7.7 The eighth priority of the plan is to support community capacity and empowerment, and the ninth priority of the plan is support economic development. These priorities fall under the rural development policy framework. Policy 3.3 under these priorities aims to "support development of a low carbon economy, with a particular focus on increasing renewable energy generation, especially biomass and hydro, that is compatible with conserving the special qualities of the National Park and maintaining the integrity of designated sites. It is considered by the Park Authority that large-scale wind turbines are not compatible with the landscape character or special landscape qualities of the National Park. They are inappropriate within the National Park where outside the Park they significantly adversely affect its landscape character or special landscape qualities; supporting businesses and communities to use less energy, reduce emissions, improve the energy efficiency of existing buildings, generate low impact renewable energy, reduce, reuse and recycle resources, and plan for a changing climate; maximising the benefits to communities through direct use of locally generated energy or, where sold to the grid, reinvesting income to support community development; and promoting high standards of sustainable design and efficient use of energy and materials in construction."

Cairngorms National Park Local Development Plan 2015

2.7.8 The current Cairngorms National Park Local Development Plan was adopted in 2015. The development plan recognises that the national park has natural resources which pose the opportunity to generate renewable energy from a variety of sources while protecting and enhancing the natural environment. This includes wind energy. Renewable energy projects however should not adversely impact the special landscape qualities of the national park.

2.7.9 Renewable energy projects located out with the national park boundary still have the potential to affect the special landscape qualities of the national park and this should be taken into consideration. It should be noted again that CNPA are a neighbouring authority and not the planning authority.

2.7.10 The development plan also recognises that renewable energy is an important part in the future of energy production with the changing reliability of energy produced by finite resources such as fossil fuels. It is also recognised that they play an important part in improving resilience and adapting to climate change while addressing fuel poverty.

2.7.11 This is in line with the national focus on renewable energy and the Scottish Government's targets of producing 100 % of Scotland's demand for electricity from renewable sources and 11 % of Scotland's heat demand from renewable resources by 2020.

2.7.12 Renewable energy is also supported by the plan for the benefits they bring to local communities and businesses.

2.7.13 Throughout the duration of the plan (2015-2020) an increase in renewable energy production within the Cairngorms National Park is expected to be seen as well as an advance in adapting to a low carbon economy.

[24] Available at: http://www.moray.gov.uk/downloads/file83422.pdf (accessed 19/10/2017)

[25] Available at: http://cairngorms.co.uk/wp-content/uploads/2016/06/160608CNPPP3mainDoc1.pdf (accessed 18/10/2017)

2.7.14 The development plan states under Policy 7: Renewable Energy that "renewable energy generation will be considered favourably where:

- *They contribute positively to the minimisation of climate change;*
- *They complement the sustainability credentials of the development;*
- *They conserve and enhance the special qualities of the Park;*
- *They include appropriate means of access and traffic management; and*
- *They adequately minimise all cumulative effects."*

2.7.15 The development plan also states under Policy 7: Renewable Energy that "in addition, all wind energy proposals must adequately minimise:

- *All noise impacts from the development;*
- *All shadow flicker caused as a result of the development; and*
- *The impact of the development on all aviation interests."*

"Large-scale commercial wind turbines are not compatible with the special qualities of the National Park and are not considered to be appropriate"

Cairngorms National Park Main Issues Report 2017

2.7.16 The Cairngorms National Park Main Issues Report (MIR) was published in November 2017 and the opportunity to engage was given until the 2nd of March 2018.

2.7.17 The overarching aim of the MIR is to protect the special landscape qualities of the Cairngorms National Park. The MIR also suggests that low carbon technologies should be used in relation to creating resource efficient places within the national park.

2.7.18 The MIR states that minor technical changes in relation to:

- *"Use of conditions and/or financial bonds to secure decommissioning and restoration;*
- *Highlight need to address working corridors and access arrangements for future hydro proposals; and*
- *Encourage consideration of heat networks or other microgeneration and heat recovery technologies"*

Changes will be required to be made to Policy 7: Renewable Energy of the Cairngorms National Park Local Development Plan 2015 though it is not considered a main issue topic within the published MIR.

2.8 SUMMARY

2.8.1 This chapter has summarised the guiding legislation and policy in relation to renewable energy and planning at both local, regional national and international levels. In designing and assessing the proposed development, these policies have been considered so far as it has been possible to do so.

2.8.2 The chapter has given due consideration to the Scottish Energy Strategy (2017) and the associated Scottish Onshore Wind Energy Policy Statement (2017). Both of these documents duly recognise that the economic landscape for onshore wind turbine development changed following the removal of subsidies in 2015, and therefore if onshore wind is to remain a viable form of energy generation wind turbine typologies will need to become larger (taller in overall height with larger rotors).

2.8.3 In particular, consideration has also been given to planning policy and supporting guidance in Moray, which supports a general move towards a low carbon economy for the area and recognises there is scope for further development in the area around the existing Paul's Hill Wind Farm. Further details on how these matters have been considered are referenced throughout this ES. Attention has also been given to the Cairngorms National Park's policies, as the proposed development lies approximately 7 km from the park and is visible from certain viewpoints within the park. The visibility from the park and the impact upon the Special Qualities is considered in detail in the LVIA chapter (Chapter 6). An overall assessment of how these policy matters have been considered in relation to the proposed development are set out in the Planning Statement which accompanies this application.

Document history

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Chapter 3

Site Selection and Design Evolution

Contents

Glossary

Term	Definition
Environmental Impact Assessment	Environmental Impact Assessment (EIA) is a means of drawing together, in a systematic way, an assessment of the likely significant environmental effects arising from a proposed development.
Environmental Statement	A document reporting the findings of the EIA and produced in accordance with the EIA regulations.

Term	Definition
Landscape and Visual Impact Assessment	A separate but closely linked process that operates within the overall framework of the EIA. It specifically aims to ensure that all possible effects of change and development both on the landscape itself and on views and visual amenity are taken into account in decision-making.
Existing Paul's Hill Wind Farm	The 'Existing Paul's Hill Wind Farm' refers collectively to the existing Paul's Hill development.
Scheduled Monument	A scheduled monument is a monument of national importance given legal protection under the Ancient Monuments and Archaeological Areas Act 1979.
The Proposed Development	The proposed Paul's Hill II Wind Farm.
The Proposed Development Area	Red line boundary (application area)
Zone of Theoretical Visibility	The area predicted to have views of a proposed development on the basis of a digital terrain model or digital surface model, which may/may not take account of landcover features.

List of Abbreviations

List and describe your abbreviations here.

Abbreviation	Description
ATC	Air Traffic Control
BAA	British Airports Authority
BT	British Telecom
CAA	Civil Aviation Authority
CFD	Computational Fluid Dynamics
CMS	Construction Management Statement
EIA	Environmental Impact Assessment
ES	Environmental Statement
GIS	Geographic Information System
GWDTE	Ground Water Dependent Terrestrial Ecosystem
JRC	Joint Radio Company
LVIA	Landscape and Visual Impact Assessment
LDP	Local Development Plan
MOD	Ministry of Defence
MW	Mega Watt
NATS	National Air Traffic Services
Ofcom	Office of Communications
PAC	Pre-Application Consultation
PAN	Planning Advice Notice
RSPB	Royal Society for the Protection of Birds
RAMSAR	Ramsar Site is a wetland site designated of international importance under the Ramsar Convention.
SEPA	Scottish Environmental Protection Agency
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
ZTV	Zone of Theoretical Visibility

3.1 INTRODUCTION

3.1.1 The purpose of this chapter is to identify the steps that have been considered in the design evolution of the proposed Paul's Hill II Wind Farm (the proposed development). This chapter demonstrates how the site design and the layout of the turbines evolved through the initial site selection process, identification of various constraints and site specific factors, and highlights the key design criteria applied.

3.1.2 Planning Advice Note (PAN) 68: Design Statements explains the design statement process. Design and Access Statements are a statutory requirement for all Major Developments under the terms of the Planning etc. (Scotland) Act 2006. Although not a statutory requirement for a Section 36 application, this chapter nevertheless explains the design process which has been gone through in arriving at the final layout.

3.2 THE SITE SELECTION PROCESS

3.2.1 Natural Power was approached by the Applicant, Paul's Hill II Limited, with a proposal for an extension to the existing Paul's Hill Wind Farm (the existing Paul's Hill development). The Applicant's has had connections with this site over 20 years and knowledge gained during this period has led to the conclusion that it is a site suitable for further development. Suitability factors include the following:

- Suitable wind speeds;
- Suitable separation distance from dwellings;
- Reasonably close proximity to viable grid connection;
- Willing landowner;
- Potential to use existing infrastructure, as far as practical;
- Suitable land area to accommodate generating capacity; and
- No significant constraints preventing further development.

3.2.2 Initial feasibility assessments indicated that there was opportunity for further wind energy development at the site of Paul's Hill.

3.3 INITIAL FEASIBILITY ASSESSMENT

3.3.1 Following site selection, a feasibility assessment was carried out against the potential constraints detailed below. The initial site feasibility assessment demonstrated the suitability of the site for wind farm development. Following the results of the initial feasibility assessments, the proposed development was scoped and then a full Environmental Impact Assessment (EIA) undertaken, with the results presented in the relevant chapters of this Environmental Statement (ES).

Wind Resource

3.3.2 Initial long term wind resource estimates were derived from multiple sources including site measurements collected on the existing Paul's Hill Wind Farm. The existing site achieves a capacity factor of ~ 30%. Early indications for the proposed development is that the capacity factor will be ~ 40% for turbines up to 149.9 m to blade tip.

3.3.3 Although these values should be taken as indicative, they imply that the wind resource at the proposed development has the potential to deliver an economically viable wind energy development.

3.3.4 Detailed assessments have been undertaken using state of the art VENTOS Computational Fluid Dynamics (CFD) modelling in order to better understand the local wind regime. This has led to an improved understanding of the specific complex flow regime, that results from the terrain and forestry surrounding the proposed development. The turbulence intensity, wind shear, inflow angle and veer across the site were assessed in order to inform the design process (along with all relevant physical, environmental and technical constraints). The process was undertaken iteratively in order to arrive at the appropriate number, size and location of turbines for the proposed development to minimise project risks (turbine performance / operational issues) and maximise project efficiency and energy yield output. A full anemometry monitoring campaign has been commenced, using industry best practice monitoring techniques (combination of anemometer mast and LiDAR remote sensing) in order to capture detailed wind profiles and further refine the wind resource on site.

Proximity to Dwellings

3.3.5 The nearest dwelling (Corglass Farm) is approximately 1.5 km from the nearest turbine. Potential noise, shadow flicker and visual amenity impacts have been given consideration during the site design iterations to ensure minimised effects on nearby residents. A detailed noise assessment is provided in Chapter 13: Human Health and Population. Shadow flicker is also considered in this chapter. Residential visual amenity is considered fully in Chapter 6: Landscape and Visual Assessment, of the ES.

Ecology and Ornithology

3.3.6 Pre-planning ecology assessments were conducted to assess the site connectivity with local statutory designated sites and to uncover existing records of raptor activity around the proposed development. A desk study of the proposed development was conducted - the results of which state that there are no designated ecological or ornithological constraints, such as Sites of Special Scientific Interest (SSSI), Special Protection Areas (SPA) or RAMSAR, within the site boundary, or in the immediate vicinity. As a result of the pre-planning ecology assessment the proposed development was considered unlikely to impact on designations and have a significant impact on target species, and as such was considered a potentially suitable site for a wind energy development, subject to further assessment. Potential effects upon ecology and ornithology are fully assessed in the EIA and the findings presented in Chapter 7: Ecology Assessment and Chapter 8: Ornithology Assessment, of the ES.

Hydrology, Geology and Hydrogeology

3.3.7 A desk study of the proposed development area was conducted within the feasibility assessment. A number of watercourses were identified within the proposed development area from the 1:10,000 Ordnance Survey maps; a 50 m buffer from these was applied which excludes development within these areas.

3.3.8 A peat depth survey using a 100m grid also informed the site design. This has subsequently been backed up by a detailed peat depth survey focussing on the turbine locations and the infrastructure locations.

3.3.9 Potential effects upon Hydrology, Geology and Hydrogeology including private water supplies and on peat have been fully assessed in the EIA and the results presented in Chapter 10: Hydrology, Geology and Hydrogeology, of the ES and the accompanying Peat Stability Risk Assessment (see appendix 10.2 in Volume 4 of the ES).

Grid Connection

3.3.10 It was proposed during the initial site feasibility that Paul's Hill II would utilise the same grid connection route as the existing Paul's Hill Wind Farm, connecting into the electricity grid at the substation at Glenfarclas. Additional capacity for the development has been secured.

Access

3.3.11 The proposed development will utilise the same access route that has been used for the existing Paul's Hill Wind Farm development. Further detailed work on the access route will be undertaken when a turbine model has been selected for the site. The potential effects of the proposed development on transport and access have been fully assessed in the EIA and the results are presented in Chapter 12: Traffic and Transport, of the ES

Military and Civil Aviation

3.3.12 The potential for the proposed development to interfere with Military and Civil Aviation assets has been considered during the feasibility phase. A map assessment indicated that the proposed development is located near two potential areas of aviation constraint. Further assessment revealed that the proposed development is located within the consultation zone of Ministry of Defence (MOD) RAF Lossiemouth, and there would be potential for interference with Inverness Airport radar. The potential effects on Military and Aviation are presented in Chapter 11: Aviation and Existing Infrastructure, of the ES.

Landscape and Visual

3.3.13 Landscape and visual issues were considered in detail at an early stage of the project. A number of sources of information were used at the time to inform the design. These include, but are not limited to the following:

- Moray Local Development Plan which contained policies specific to renewable energy developments
- Cairngorms National Park Local Development Plan
- Moray Onshore Wind Energy Supplementary Guidance
- Moray Wind Energy Landscape Capacity Study
- Moray Landscape Character Assessment

3.3.14 The initial feasibility assessment of landscape and visual impacts concluded that the proposed development would comply with policies set out within the Moray Local Development Plan. We also considered that the proposed development would have minimal impact on the special qualities of the Cairngorms National Park. An initial desktop assessment of the visual influence of the proposal was undertaken using a Zone of Theoretical Visibility (ZTV) map to a radius of 40 km. The ZTV indicated that there was potential for visibility to the north and to the east of the proposed development; however visibility beyond 15-20 km would be limited. It was concluded that whilst further assessment would be required, it would be possible, with careful site design, to minimise (with a particular focus on the key viewpoints) any additional landscape and visual impacts created by the proposed development over and above those that already exist due to Paul's Hill Wind Farm. A professional Landscape Architect worked closely with the project team from the outset, reviewing the siting and design of the wind farm in order to minimise as far as practical the potential landscape and visual and the cumulative effects of the proposed development. The findings of the landscape and visual impact assessment are set out in Chapter 6: Landscape and Visual Assessment, of the ES.

Archaeology and Cultural Heritage

3.3.15 During the initial feasibility study the presence of cultural heritage were investigated within and out with the site boundary. This confirmed that there are no cultural heritage assets within the turbine envelope. The main impacts were considered to be potential impacts on the setting of cultural heritage assets out with the proposed development. The potential impacts upon archaeology and cultural heritage have fully assessed in the EIA and the results are provided in Chapter 9: Cultural Heritage, of the ES.

Land Use

3.3.16 The proposed development is located approximately 5 km west of Upper Knockando on land owned by Ballindalloch Estate. The land is currently not grazed using domestic livestock.

3.3.17 The proposed development is located to the east of the existing Paul's Hill Wind Farm. The existing Paul's Hill Wind Farm commenced operation in May 2006 and consists of 28 turbines with a maximum ground to blade tip height of 100 m and a total installed capacity of 64.4 MW.

Existing Infrastructure

3.3.18 The presence of existing infrastructure was considered, such as service pipelines including the Scottish Water mains water supply pipe and cables. Television transmission, mobile telephone network and electromagnetic paths were considered in the initial feasibility study. Geographic Information Systems (GIS) data used within the initial feasibility study indicated there was no existing infrastructure within the proposed development area that would be impacted by the proposed development, subject to further assessment. The potential impacts upon existing infrastructure has been fully assessed in the EIA and the results provided in Chapter 11: Aviation and Existing Infrastructure, of the ES.

Initial Site Feasibility Assessment Conclusion

3.3.19 The initial site feasibility assessment concluded that the site offers a potential for a 7 turbine development. The initial feasibility assessment indicated that the site had:

- A good wind resource across the site;
- The proposed development was unlikely to impact on any ecological designation and target species;
- Sufficient grid capacity;
- Visibility beyond 15-20 km would be limited;
- No direct and limited indirect impacts on archaeological and cultural heritage features; and
- The proposed development would not be expected to interfere unacceptably with any known existing infrastructure.
- Whilst there could be some potential impacts on military and civil aviation radar, these impacts are considered to be mitigatable.

3.3.20 However, further assessments would be required to optimise the design and layout of the proposed development, these included:

- In-depth assessment of the wind regime;
- Detail ground investigation surveys;
- Onsite background noise monitoring campaign;
- Full Landscape and Visual Impact Assessment and Cumulative Assessment;
- Review and confirmation of existing public access and a thorough construction infrastructure study and site investigation to establish the presence and extent of anticipated constraints to construction site access and gain better understanding of the ground conditions;
- Consultation with MoD and Inverness Airport regarding potential aviation constraints; and
- Further archaeological investigation.

3.4 THE CONSULTATION PROCESS

3.4.1 The consultation process was carried out to:

- Identify any further key considerations;
- Clarify the key points raised during the initial feasibility assessment;
- Promote dialogue with both statutory and non-statutory consultees and other stakeholders concerning key issues; and
- To confirm and agree the proposed methods for survey, evaluation and assessment.

3.4.2 A summary of the consultation responses is set out in Table 3.1 below. The full Scoping Report submitted and the Final Scoping Opinion Response received back from the Scottish Government is presented within Technical Appendix 1.1 and 1.2 in Volume 4 of the ES.

Table 3.1: Summary of Consultation Responses

Consultee	Summary of Comments (Scoping Opinion)	Action by Natural Power	Addressed in ES
Statutory			
Moray Council	The chapter on traffic and transport should be supported by a construction method statement (CMS) and construction traffic management plan (CTMP) focussing on delivery of abnormal loads and the impact of HGV construction traffic on the local roads networks. This would involve a pre commencement condition survey in a format agreeable to the Moray Council as the local roads authority and possibly a Section 96 wear and tear agreement if necessary. EIA report should address and mitigate any conflict between the proposal and RAF Lossiemouth if the MOD deems it necessary.	Agreed with Moray Council on the 15th December by phone call that a construction method statement and a construction traffic management plan will not be provided at the current time as insufficient detail is available (i.e. no turbine has been selected and the main contractor has not been selected). It was agreed that these would be provided pre construction.	A level of detail of proposed construction and traffic volumes are provided in Chapter 4: Description of Development and Chapter 12: Traffic and Transport.
SEPA	Site specific comments included ensuring ES covers each groundwater supply that is 250m from a groundwater supply source. Also that watercourse crossings are designed for a 1 in 200 year event. There is no need for information on flood risk, as this is not a flood risk area. In relation to Appendix 1 of the letter, need to ensure the protection of the River Spey SAC and protection of the water environment. Good practice and guidance must be followed. Detailed information on peat depths across the site should be provided and the impact on GWDTE's should be assessed and avoided as far as is practical.	Ecologists and hydrologists have dealt with the issues highlighted. Private water supplies and groundwater supplies have been identified. Consultation with the local planning authority was undertaken and 39 letters were sent out to households. Groundwater supply sources have been identified and risk assessed. Watercourse crossing have been designed for a 1/200 year event. River Spey and catchment has been given due consideration. Peat depth information has been provided and 100 m grid and detailed peat probing around infrastructure has been undertaken. GWDTE's have been avoided where possible as have areas of deep peat as far as practical.	Chapter 7: Ecology and Chapter 10: Hydrology, Geology and Hydrogeology.
SNH	HRA required regarding potential impact on River Spey SAC. In additional to the CEMP it is recommended that an operational phase breeding bird protocol is prepared to detail what happens on site in the event of sensitive species nesting in locations where there may be operational activities. Agreed to scoping out otter for the main wind farm site. Agreed to scoping out the distant SPA's as there are no connectivity. Landscape and Visual. Main issue is the request from 1 additional viewpoint and the inclusion of Ourack and Clash Gour in the cumulative assessment [SNH also responded to the 2014 proposal[1]]	Proposing to screen out the need for HRA relating to the River Spey SAC for the wind farm site. It is assumed currently that there will be no adverse impact on the River Spey SAC associated with the access route, specifically in the vicinity of Blacksboat Bridge. If additional works are required, further details will be provided once a turbine has been selected and the extent of works are known. Re. landscape and visual, communications have taken place with SNH (July 2017) regarding the additional viewpoint. It has been agreed that there is no need to include this in the assessment as the visibility is very limited. Wireline to be included as illustrative viewpoint. SNH agreed to scope out Ourack and Clash Gour from the Landscape & Visual assessment due to lack of detailed information. [SNH 2014 response has also been taken into consideration].	Chapter 7 (Ecology), Chapter 8 (Ornithology) & Chapter 6 (LVIA)
Cairngorms National Park Authority	The site is located approximately 7 km (at its nearest point) to the north of the Cairngorms National Park. CNPA have asked that the potential for impacts upon the National Park be fully considered in any submission made. They considered that key potential impacts would be: • Landscape and visual effects from the northern parts of the Park arising from the increased number of turbines visible. The differences in height and layout could make the proposed extension to the wind farm more visible and visible in additional areas within the Park. • Cumulative effects as experienced from the Park. • Effects on the Special Landscape Qualities experienced within the Park.	A letter of response provided to CNPA in July 2017. The additional viewpoint (within the Cairngorms National Park) was assessed and it was agreed that the visibility from this VP is very limited. It was decided that a wireline was to be included as an illustrative viewpoint. It was agreed with CNPA and SNH to scope out Ourack and Clash Gour due to lack of detailed information about these proposals. Policies 1.3 and 3.3 are considered within the Landscape & Visual chapter. All other points raised were addressed in the letter.	Chapter 6: LVIA.

[1] SNH providing detailed comments to the 2014 proposal. Many of their comments provided remain valid for this proposed development. The SNH comments can be viewed on the Energy Consents Unit website: http://www.energyconsents.scot/ApplicationSearch.aspx. Search for Paul's Hill II and access the 2014 information (Scoping Opinion).

Consultee	Summary of Comments (Scoping Opinion)	Action by Natural Power	Addressed in ES
	The ES should contain sufficient information and analysis in respect of these topics for the appropriate policy tests to be undertaken (National Park Partnership Plan policies 1.3 and 3.3 and Scottish Planning Policy test contained in paragraph 212). It was requested that cumulative assessment include pre-application developments Clash Gour and Ourack due to concern about the cumulative impact of these developments. It was also requested that a viewpoint is added on the B970 at Mains of Garten (296541, 819941) for assessing the effects on the landscape character resulting from the proposal which is substantially different in height, size and appearance to the existing Paul's Hill Wind Farm. Concerns were raised about viewpoints that show visibility of any of the turbines in the low lying Strath, due to potential impact it will have on the experience of Special Landscape Qualities there.		
Non-Statutory Consultees			
Landscape			
The Crown Estate	Crown Estate Scotland is not affected by this proposal.	No further action required.	
The Mountaineering Council of Scotland	No response received.	No further action required.	
Scotways	No response received.	No further action required.	
Scottish Wild Land Group	No response received.	No further action required.	
Garden History Society	No response received.	No further action required.	
in Scotland			
John Muir Trust	Do not comment at the scoping stage due to staff resourcing. Will issue comment once the project has progressed to application.	Sent information about the application but do not wish to be consulted. No further action required.	
Ecology/Ornithology			
Marine Scotland	Potential impacts of the River Spey Catchment SAC should be fully assessed – salmon are a primary feature of this status. It is encouraged that up to date information to be used to inform the EIA. Impact of any felling, if carried out, on the water quality and aquatic biota and the cumulative impact as a result of the present proposal and adjacent wind farms should be considered throughout the development.	Fish surveys have been undertaken on watercourses to the west feeding into the SAC. The impact of the limited felling that will be required along the cable route between Marypark and Glenfarclas will be addressed in the CMS and pre construction surveys undertaken. If any potential impacts are identified they will be appropriately mitigated.	Chapter 7: Ecology.
Spey Fishery Board	Indicated that they had not responded previously because we did not have any significant concerns regarding the proposals. They have had a long history of association with the Paul's Hill Wind Farm and so the developers have already been in touch with us directly. As a result, they are already engaging with them over the details and are expecting to undertake survey work on their behalf, should the scheme proceed.	No further action required immediately but should inform them when the ES has been submitted.	
RSPB Scotland	Overall, the RSPB is satisfied that the proposed ornithological survey methods are appropriate.	No further action required immediately but should inform them when the ES has been submitted.	
Scottish Wildlife Trust	No response received.	No further action required.	
Cultural Heritage			
Historic Environment Scotland	The ES should pay attention to the impacts on Category A listed buildings and scheduled monuments. This includes assessing the impacts on Ballindalloch Castle (LB8449), Ballindalloch Castle Dovecot (LB8450). Cumulative impacts should also be assessed and examined through the use of cumulative visualisations.	Ballindalloch Castle and Ballindalloch Castle Dovecote have been assessed in the ES chapter. Cumulative impacts have also been considered from the above (only Paul's Hill I of relevance).	Chapter 9: Cultural Heritage.

Consultee	Summary of Comments (Scoping Opinion)	Action by Natural Power	Addressed in ES
Hydrology			
Scottish Water	Scottish Water has abstractions from 2 sources in the area: Spey Boreholes and Ordiequish collecting chamber which are surface water influenced. The sources are located 30km downstream of the site on the River Spey. As part of the ES, an assessment would need to be undertaken to ensure that any activities do not impact these sources.	These have been assessed and it is concluded that there is no impact upon these sources.	Chapter 10: Hydrology, Geology and Hydrogeology.
Aviation and EMI			
Civil Aviation Authority – Airspace	No response received.	We are aware that Inverness Airport is the only airport that would be impacted by the proposed development.	Chapter 11: Aviation and Existing Infrastructure.
NATS Safeguarding	No response received.	No further action required immediately but inform them when the ES has been submitted.	
Defence Infrastructure Organisation	Development will cause unacceptable interference to ATC radar used by RAF Lossiemouth being situated 29.5km away. The reasons for the objection include: i. Restrictions the development would impose upon departure routes including Standard Instrument Departures (SIDS); ii. Restrictions the development would impose upon approach and arrival procedures; iii. Restrictions the development would impose upon LARS/ZONE traffic patterns; iv. Restrictions the development would impose upon special tasks conducted by the Unit; v. Restrictions the development would impose upon Tactical Aid to Navigation (TACAN) procedures; vi. Air traffic density in the vicinity of the proposed windfarm; vii. Existing clutter or windfarms in the vicinity of the proposed windfarm; and viii. The type and characteristics of aircraft routinely using the airspace in the vicinity of the proposed windfarm. ix. The performance of the radar x. The complexity of the ATC task xi. The workload of controllers If the developer is able to overcome the issues stated then the MoD request that all turbines be fitted with accredited 25 candela omni-directional red lighting or infra-red lighting.	Communications are ongoing with the MOD. If the interference caused by the turbines is considered unacceptable suitable mitigation will be required, requiring approval with the MOD. Mitigation can be secured through an appropriate planning condition.	Chapter 11: Aviation and Existing Infrastructure.
Highlands and Islands Airport	This development falls inside the safeguarded areas for Inverness Airport (as defined in CAP 764 – CAA Policy and Guidelines on Wind Turbines and CAP 670 - Air Traffic Services Safety Requirements). The turbines could possibly affect the performance of electronic aeronautical systems for the airport. HIAL would not wish to see a degradation of any of these services, particularly the Radar installation. (At 150m these turbines are likely to be in line of sight of the radar). It should be noted that HIAL would work with the developer towards a resolution. However, HIAL are likely to object to any proposal which impacts on the Radar, unless an acceptable solution can be found to mitigate the effect on Inverness Airport's operation.	An initial assessment has been undertaken with the airport and 2 turbines (T6 & T7) are visible to the radar. A meeting was held on 1st February 2018 in relation to this. Communications are ongoing with HIAL/Inverness airport to discuss appropriate mitigation. Mitigation can be secured through an appropriate planning condition.	Chapter 11: Aviation and Existing Infrastructure.
BAA Aerodrome Safeguarding	No response received.	No further action required.	
Highland Gliding Club	Issue of the proposed wind farm was raised at a board meeting at Highland Gliding Club and the decision was not to make any representations at this stage. They reserve the right to make representations at some point in the future, once we gauge further reaction, including from RAF Lossiemouth.	No further action required immediately but will inform them when the ES has been submitted.	
Joint Radio Company	JRC objected to the development on the grounds that turbines 3, 5, 6 and 7 could potentially interfere with SSE 0929271/1 and SCHY 0929271/1.	Communication with JRC has been undertaken in January 2018 and a detailed assessment has now been undertaken regarding the potential interference to the link. The assessment identified that is only T7 that could potentially interfere with the link, and mitigation is	Chapter 11: Aviation and Existing Infrastructure.

Consultee	Summary of Comments (Scoping Opinion)	Action by Natural Power	Addressed in ES
		possible. Potential mitigation measures include micrositing of the turbine away from the link or upgrade of the antenna. These options are currently being explored with the link owner and the mitigation could be secured through planning condition.	
Human Health and Population			
Visit Scotland	Given the aforementioned importance of Scottish tourism to the economy, and of Scotland's landscape in attracting visitors to Scotland, Visit Scotland would strongly recommend any potential detrimental impact of the proposed development on tourism - whether visually, environmentally and economically - be identified and considered in full. This includes when taking decisions over turbine height and number.	There is a section on the potential impact on tourism impacts in the Human Health and Population chapter. LVIA also considers the potential impacts to tourist routes and tourism receptors in the area such as tourist towns and tourist attractions.	Chapter 6: LVIA and Chapter 13: Human Health and Population.
British Horse Society	The ES should include an assessment of the potential impacts of the proposed wind farm on public outdoor access rights. The Environmental Statement should adhere to Section 7 of the publication "Good Practice during wind farm construction 2010" and together with addressing the impact on outdoor access, mitigation/enhancement measures should be identified. The Environmental Statement should include a Public Access Plan to demonstrate how the applicant/developer intends to manage walkers, cyclists and horse riders exercising rights in the vicinity of the wind turbines. The Scoping Opinion should confirm the requirements to address this matter including identification of all required/proposed mitigation measures to address impacts on routes, and identify opportunities to extend and enhance public access/path networks both within and to/from the site and any nearby path network. Details of all required/proposed alterations to existing and provision of new path routes should be included within the formal submission. The Scoping Opinion should confirm that the Moray Access Manager should be consulted regarding public outdoor access including matters relating to established/recognised rights of way and core path initiatives within the proposed wind turbine site and the surrounding area. In addition, a Public Access Plan should be prepared and included as part of the formal submission.	The potential impact on recreational access is considered in Chapter 11 and Chapter 13 . It is anticipated that there may be some impact on access to the Speyside Way near to Blacksboat Bridge during the construction period (if any works are required) and we would anticipate to provide suitable mitigation (if required) within the CEMP.	Chapter 11: Aviation & Infrastructure and Chapter 13: Human Health and Population.
Misc.			
Forestry Commission Scotland	Additional information is required for Scoping native pinewood and upland Birch are present on the development site. The Scottish Governments Policy on Control of Woodland removal states that there is a strong presumption in favour of protecting this woodland and against removing it. There is a small amount of woodland on the development site, the scoping reports lacks details how the land use will be addressed through the ES. The River Spey SAC along the Allt a'Gheallaidh should be considered as part of the proposed HRA. FCS recommends a separate forestry chapter is added to the ES.	There is no forestry on the wind farm site, and limited forestry felling will be required along the cable route between Markpark and Glenfarclas. It is therefore propose that there is no forestry chapter within the ES. The River Spey SAC has been considered in the ES (Chapter 7).	Chapter 7: Ecology.
Nuclear Safety Directorate (HSE)	No response received.	No further action required.	

Source: <Insert Source or notes>

Key Considerations Identified through the Consultation Process

3.4.3 The consultation process has confirmed our findings of the Initial Feasibility Studies and has shown that whilst the findings to date demonstrate the site is suitable for wind energy development, the following areas required particular consideration during final design and assessment:

- Location of Ground Water Dependent Terrestrial Ecosystems (GWDTE's);
- Detailed peat depth data;
- Topography and detailed engineering design requirements.

3.5 DETAILED DESIGN CONSIDERATIONS OF THE PAUL'S HILL II LAYOUT

3.5.1 This subsection describes the design considerations for the proposed development, and discusses how the evolution of the site design and layout continued throughout the EIA Process. The layout of the proposed development was designed under the guidance, requirements and considerations of Paul's Hill II, Natural Power and other contributing specialist consultants such as landscape architects. The site design process was guided by the findings of the baseline surveys, by the opinions of the specialist consultants and by issues raised by statutory and non statutory consultees in line with Scottish Planning Policy (please refer to the PAC Report).

3.5.2 The aim of the siting and design process was to arrive at a design that would be acceptable in the environmental landscape and visual terms, technically feasible and economically viable. The design process included the selection in number and size of turbines, placement of turbines, tracks and other associated infrastructure whilst taking account of landscape and visual concerns, ecology, hydrology and peat.

3.5.3 The location of individual turbines was guided by the technical requirements for the turbine including the potential manufacturer's warranty requirements, slope angles and the nature of the topography in which the turbine was to be located. Siting was also guided by the results of the baseline studies scoping exercise with particular attention given to the likely landscape and visual assessment effects, residual amenity and the hydrology and peat resource at the site.

3.5.4 Computer modelling was used as a tool to aid the development of the designed layout. Wirelines were generated for views from key locations around the site and used to 'test' the design in views from the surrounding area.

3.5.5 The remainder of this chapter highlights the site design considerations and the key stages in the site design evolution, illustrating the iterative process that has resulted in the final proposed development. Through each of the design iterations considered, key technical and environmental constraints and design criteria have been applied, which are described in more detail below.

Influence of the Policy Context

3.5.6 With regard to the full range of impacts, these have been considered throughout the ES chapters. A full review of legislation and planning policy has been provided in Chapter 2: Policy Context, of the ES, and an assessment of such material is provided in the accompanying Planning, Design and Access Statements, as well as in the individual ES chapters. A review was undertaken of design guidance documents and other standard texts on wind farm development such as the SNH guidance on *'Siting and Designing Windfarms in the Landscape' (February 2017).* These are considered further in Chapter 6: Landscape and Visual Assessment, of the ES.

3.5.7 The iterative design process was brought to a conclusion and the final design fixed, when it was considered that an acceptable balance had been struck in the context of the policies and the various other considerations identified in this chapter.

Design Strategy Principles

3.5.8 The design strategy for the key elements of the proposed development has taken into account the following objectives:

- To provide a turbine layout with simple form, which relates to the landscape character of the site and its surroundings;
- To create a turbine layout which reflects the scale of the landscape in which it is located;
- To avoid an overly complex and visually confusing layout;
- To achieve a balanced composition of the turbines against the landscape and skyline from key view point locations;
- To reflect the pattern of nearby existing proposed wind farms; and
- To maximise site efficiency and electricity production targets.

3.5.9 In addition, the following principles have been taken into account in order to ensure that the proposed development best meets the objectives detailed above whilst maximising the efficiency of the proposed development:

- Larger turbines have been selectively used in areas of lower ground levels and contained visibility, meaning larger turbines can be accommodated more easily;
- Noting the current climate which is pushing for greater efficiency in electrical generation within a very competitive market, turbines of 149.9 m to tip height are considered within the design of the proposed development and are proposed within the final design. Higher tip height turbines with larger rotors are capable of significantly increasing the total output therefore maximising the chances of the development being realised if planning can be secured. In addition, the land take of the proposed development is reduced as fewer turbines are required to generate a greater total output than turbines with lower tip heights; this also reduces the environmental impacts and the carbon footprint of the proposed development; and
- Noting that the site is within a search for large typology wind turbines area (as defined in the adopted LDP as turbines greater than 80 m), the principle of turbines within the proposed development area is already accepted. Larger turbines therefore allow the potential of this search area to be maximised.

3.5.10 Key objectives specific to the LVIA were also adopted for the proposed development and is discussed within Chapter 6: Landscape and Visual Assessment, of the ES.

Constraints to Development

3.5.11 The main considerations on site which influenced the final design of the proposed development (some of which are shown in Figure 3.1 in Volume 3 of the ES) were:

- Watercourses;
- Wind flow;
- Ground conditions and topography;
- Protected species and habitat;
- Landscape and visual;
- Residential amenity and noise;
- Cultural heritage; and
- Aviation and infrastructure.

Public Consultation

3.5.12 The principles of effective public engagement as described in PAN 3/2010: Community Engagement to provide:

- Access to information.
- The opportunity to contribute ideas.
- The opportunity to take an active part in developing proposals and options.
- The opportunity to be consulted and make representations on formal proposals and policies.
- The opportunity to receive feedback and be informed about progress and outcomes.

3.5.13 Building upon the relationships developed with the local community throughout the lifetime of the present Paul's Hill Development, since conception of the proposed development, Paul's Hill II and their agents, Natural Power, have worked closely with the local communities in order to understand the attitudes and opinions of the local community towards renewable energy and the proposed development.

3.5.14 Natural Power, on behalf of Paul's Hill II, have liaised with the local community during the pre and post scoping period, ensuring that communities were given additional information if required and ensuring that all queries from community councils, community groups and members of the community were answered and followed up where required.

3.5.15 Public exhibitions took place in Aberlour and Knockando on the 8th and 9th of November 2017, respectively. Details of these exhibitions and other stakeholder engagements can be found in the supplementary PAC report to the ES.

Iterative Design Process

3.5.16 The iterative design approach aimed to mitigate significant effects through the careful siting and design of the proposed development which was repeatedly assessed and amended, balancing different environmental issues and consultee and public concerns during early consultation. This design process has followed advice contained in SNH's current guidance *'Siting and Designing Wind Farms in the Landscape'* (version 3a August 2017).

3.5.17 The design process began with a layout responding mainly to wind speed and wind turbine specification which took into account operational turbines on the adjacent existing Pauls Hill Wind Farm development and initial considerations of the capacity of the landform of the Paul's Hill II development area. From this starting point, turbines were relocated, modified or removed from the layout due to physical constraints, such as watercourses, areas of deep peat and steep slopes and took into account sensitive wildlife habitats and species locations and initial visual and landform sensitivities. Many of these sensitivities are illustrated in Figure 3.1 Constraints to Site Design.

3.5.18 Key stages of design iteration are represented in the three layout options, illustrated in Figure 3.2. Numerous design changes occurred between these key stages to refine the layout.

3.5.19 With reference to Figure 3.2, Option A recognised the screening function of Roy's Hill from Spey Valley visual receptors and the landscape sensitivity of this landform. The turbines were therefore all located to the west of Roy's Hill, wrapping around the operational development of Pauls Hill Wind Farm and therefore forming a visual 'rounding off' of this operational development. However, at 125 m to blade tip, these turbines were not a viable economic option and potentially too many in number for the location. The position of the most southerly turbines of T9 and T10 were also considered too prominent from the Spey Valley visual receptors as illustrated in the design viewpoint from Tormore Distillery, illustrated in Figure 3.3a Option A. It was additionally considered turbines should be pulled back from the whole of the ridgeline between Forkins and Altvounnie, which has been identified to be of significant importance for hen harrier.

3.5.20 In addition, the most north-easterly turbines of T1 and T2, located in the shallow Caochan Liath Valley were considered highly visible from the neighbouring forested moorland plateau and the C13 road pass from Upper Knockando to Dallas as illustrated in the design viewpoint from the C13 road in Figure 3.4 Option A.

3.5.21 Both sample wirelines indicate the variable positions of the blade tips for Option A layout which were all the same tip height turbines at 125 m. It was concluded that using the same tip height for all the proposed turbines did not respond to the variable rolling landform of the Pauls Hill II development area.

3.5.22 Option B (see Figure 3.2 in Volume 3 of the ES) was therefore explored with three variable tip heights, positioning lower tip heights on the higher ground of the development area and the higher tip heights of 174.5 m located on the lower slopes of the shallow Blarnish Burn Valley and to the west of the site, further away from the C13 visual receptors in the east.

3.5.23 Overall, it was considered there would be a significant improvement in wind yield and efficiency with Option B. However, some of the turbine positions conflicted with the Habitat Management Area in the north of the site. As illustrated in the wireline in Figure 3.3b Option B, T3 and T4 proposed at 174.5 m to tip were considered to exceed the capacity of the site to accommodate taller turbines above 150m in height. It was also considered the adverse effects of potential aviation lighting which would be requested for turbines above 150m in height, would be potentially significant owing to the position of the Pauls Hill II Wind Farm development, being toward the edge of the uplands overlooking the Spey Valley.

3.6 FINAL AND PROPOSED LAYOUT

3.6.1 Following a final review of the layout and taking into account the overall design strategy and identified site constraints, the decision was taken to restrict turbine height to below 150 m, mainly to address visual sensitivities. An assessment of the landscape and visual impact of turbines of this size was conducted by the project landscape architect. The assessment concluded that the additional visibility from increasing the tip height from 125m in Option A to 149.9 m would be acceptable and proposing 149.9 m turbines would ensure the proposed development would be a viable wind farm development. Some variation in tip height (T6 being proposed now at 134 m) was still considered prudent however, to accommodate the rolling nature of the development area and the rising summit of Roy's Hill. As shown in Figure 3.3a Option C, the wireline taken from Tormore Distillery shows the reduction in height of the southern turbines from Option B to Option C and the overall reduction in number of turbines visible from this location, giving an overall improvement in layout design. The final layout (Option C) is consider to be a well-balanced design from key viewpoints and receptors whilst also giving due consideration to constraints, such as ornithological receptors. As discussed in Chapter 8: Ornithology, the primary locations of hen harrier activity has been a major factor in the reduction in turbine numbers to the south of the development, for example.

3.7 CONCLUSION

3.7.1 In line with the good practice advice from the Scottish Government and procedures normally required for Major Developments under the Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2013 the proposed development has been subject to a detailed and iterative design process. Whilst this is a Section 36 application, it is consideration appropriate that this application be subject to this iterative design process, as detailed above and discussed throughout the ES. The final design has sought to balance the technical requirements of the project with the environmental considerations highlighted by consultees and the public during early consultation. The residual impacts of the design process are considered in the following individual ES chapters.

Document history

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Chapter 4

Description of Development

Contents

Glossary

Term	Definition
Ecological Clerk of Works	The Ecological Clerk of Works (ECoW) will carry out pre-construction surveys during the construction of the proposed development.
Environmental Statement	A document reporting the findings on the EIA and produced in accordance with the EIA Regulations.
The Existing Paul's Hill Wind Farm	The 'existing Paul's Hill Wind Farm' refers to the operational Pauls Hill Wind Farm.
The proposed development	The proposed Paul's Hill II Wind Farm.
The proposed development area	Red line boundary (application area).

List of Abbreviations

Abbreviation	Description
CEMP	Construction Environmental Management Plan
CDM	Construction Design Management
COSHH	Control of Substances Hazardous to Health
CMS	Construction Method Statement
ECoW	Ecological Clerk of Works
ES	Environmental Statement
HSE	Health and Safety Executive
kV	Kilovolt
O&M	Operations and Maintenance
PPG5	Pollution Prevention Guidelines 5
PPG6	Pollution Prevention Guidelines 6
PMO	Planning Monitoring Officer
SCADA	System Control and Data Acquisitions
SEPA	Scottish Environmental Protection Agency
SNH	Scottish Natural Heritage
SuDS	Sustainable Drainage System

4.1 INTRODUCTION

4.1.1 This chapter outlines the details of Paul's Hill II Wind Farm (the proposed development) as specified in Chapter 1: Introduction, of the ES, including specifications of turbines, access tracks and electrical infrastructure. It also describes the general construction methodology, timescales and typical construction equipment likely to be used. Operational and decommissioning phases are also described within this chapter.

4.1.2 The construction methods detailed below build on best practice methodologies developed at other wind farms to comply with Health and Safety requirements for construction, operations and follow relevant guidelines including the Scottish Environmental Protection Agency's (SEPA) Pollution Prevention Guidelines, SNH's Good Practice During Wind Farm Construction and SNH's/Forestry Commission Scotland's Floating Roads on Peat guidance.

4.1.3 Further construction details and mitigation will be provided in the Construction Method Statement (CMS), which will include the Construction Environmental Management Plan (CEMP).

4.1.4 It is proposed that, as far as is practical, the planning conditions that applied to the Paul's Hill Wind Farm consent in 2004 (see Appendix 1.3) should also be applied to the proposed development. This will ensure that there is, in general, duplicate sets of similar conditions applying to the wind farm as a whole with the new set recognising the use of shared infrastructure for the lifetime of the new phase of development. Reference is made in the text below to specific planning conditions in the original planning consent where it is considered that these could be applied to the proposed development.

4.2 SITE LOCATION

4.2.1 Figure 1.1 in Volume 3 of this ES shows the location and extent of the proposed development. The proposed development is located on the hills of Carn na Dubh-chlais. The proposed development is centred on British National Grid Coordinates of 313355E and 841358N respectively.

4.2.2 The application is for a wind farm comprising of up to 7 wind turbines. There will be a mixture of turbine sizes; 6 turbines of an overall height from base to tip not exceeding 149.9 m and 1 turbine of an overall height from base to tip not exceeding 134 m. After community consultations, scoping consultations and detailed design discussions it was agreed that the proposed turbine sizes allow maximum efficiency and exploitation of wind resource without significantly increasing environmental impacts. See Chapter 3: Site Selection and Design Evolution, of the ES for further details of the design process that resulted in this layout. The application also includes external transformer housing, site tracks, crane pads, foundations, underground electricity cables, control building and temporary construction and storage compounds, two borrow pits, associated works/infrastructure and Health and Safety sign posting. Infrastructure relating to the existing Paul's Hill Wind Farm (e.g. site tracks) will be utilised where practical and possible. Where this is the case this application will seek to extend the consented life of that infrastructure for the duration of the life of the proposed development. Any requirements relating to the reinstatement of such infrastructure will also therefore be deferred until the end of the operation period of the proposed development.

4.2.3 It is intended that the proposed development will make use of available capacity on the local transmission network with connection to the Glenfarclas substation.

4.2.4 As shown in Figure 1.1 in Volume 3 of the ES, the proposed development is located within the Moray Council area. As mentioned above, it is also proposed to use the existing Paul's Hill infrastructure as far as is practical, which is also entirely located in the Moray Council area. However, some additional infrastructure will be required, such as underground cabling to connect the proposed turbines to the substation.

4.3 SITE LAYOUT

4.3.1 The turbine layout and associated infrastructure is presented in Figure 1.2 in Volume 3 of the ES. This Figure illustrates the relevant elements, including locations for the 7 turbines, site tracks, crane pads, onsite electrical substation and control building, temporary construction and storage compound areas, anemometer masts and potential borrow pit search areas (local temporary sources of construction aggregate which are solely for the purpose of wind farm construction).

4.3.2 Micro-siting allows the exact turbine location and infrastructure to be modified post-consent, following detailed ground investigation and ground clearance. Through industry experience a micro-siting allowance of 50 m is considered appropriate for turbines and infrastructure. Table 4.1 below gives the centre point co-ordinates and proposed maximum tip height for each of the proposed turbines.

Table 4.1: Turbine Locations

Turbine Number	Easting	Northing	Maximum Tip Height (m)	AOD (m)
1	313931	841817	149.9	364
2	313502	841832	149.9	355
3	312960	841711	149.9	369
4	313664	841371	149.9	403
5	313229	841364	149.9	415
6	313163	840928	134	462
7	313033	840482	149.9	421

4.3.3 The layout was developed taking into account the ecological, geological, hydrological, archaeological, topographical, landscape, noise and visual constraints whilst ensuring optimal wind resource use (see Chapter 3: Site Selection and Design Evolution, of the ES for further details).

4.3.4 Concerning layout alternatives, the layouts were tested from a series of 'design viewpoints' and the iterative process continued until a series of key design objectives had been met to an appropriate degree. These are set out in Chapter 3: Site Selection and Design Evolution and Chapter 6: Landscape and Visual Assessment, of the ES.

4.3.5 In simple terms, it was considered 6 turbines with a ground to blade tip height of around 149.9 m and 1 turbine of a tip height of 134m maximised the capacity and efficiency of the proposed development whilst not significantly increasing the impact on the local environment.

4.3.6 Each turbine location, although constrained to some extent by on-site constraints was considered in landscape and visual terms until it was felt that it met the design strategy principles set out in Chapter 3: Site Selection and Design Evolution and Chapter 6: Landscape and Visual Assessment, of the ES as judged from a selection of key representative viewpoints.

4.3.7 Once this 7 turbine layout was confirmed as being acceptable with respect to other on-site interests (including ecology, hydrology, archaeology, existing land use/holdings), the layout was fixed and detailed assessment was continued and completed.

4.3.8 The total land take of the proposed development, after completion of reinstatement measures, including foundations, crane pads (see 4.12.3 of proposed reinstatement measures), site tracks and new sections of access track has been assessed to be approximately 60,620 m². The operational land use required from the existing developments and access track which is required to operate the proposed development is approximately 29,750 m², which includes tracks indicated in Figure 1.2 in Volume 3 of the ES and the use of the electrical and control buildings, and the substation. Indicative drawings for currently available technologies that suit site conditions are presented in Figures 4.1 – 4.11 in Volume 3 of this ES. Drawings include indicative turbines, turbine foundations,

site track cross sections, crane pads, turbine transformer housing, cable ducts, and the temporary construction compounds and signage.

4.4 USE OF EXISTING INFRASTRUCTURE AT PAUL'S HILL

4.4.1 The following indicates the extent of infrastructure from the existing Paul's Hill Wind Farm that is required to construct and operate the proposed development (see Figure 1.2 in Volume 3 of the ES). For each, a brief description is provided on the extent of use and evaluation.

Access and Site Tracks

4.4.2 Access to the site from the public road network would follow the same route as used for the existing Paul's Hill Wind Farm, and is discussed in greater detail within this chapter and in Chapter 12: Traffic and Transport Assessment.

4.4.3 In order to reduce the need for the construction of new tracks, thus reducing the degree of disturbance to the local environment, the proposed development would be accessed using a combination of the existing access track to site and new sections of track branching off the existing tracks. Figure 1.2 in Volume 3 of this ES shows the proposed turbine layout and the existing and proposed new access tracks. There may be some requirement to upgrade some of the existing tracks and details of the nature of the upgrades will be agreed during the development of the CMS once the turbine manufacturer requirements are known. The use of these will allow access to extend and build the new tracks, to allow plant to dig any new cable trenches and thereafter to access the site for operational and eventual decommissioning purposes.

4.4.4 During the construction of the proposed development, pre-construction surveys will be carried out by an Ecological Clerk of Works (ECoW) to ensure that the use of these existing tracks will have minimal environmental impact. Likewise, all environmental considerations and controls discussed within the ES apply to the use of all existing tracks and infrastructure. This further reduces potential impacts during the construction and operation of the proposed development.

4.4.5 By following the measures described, the use of the tracks during the construction and operational stages of the proposed development are not expected to have any significant impacts.

4.4.6 In accordance with conditions 7.5 and 7.6 of Paul's Hill planning consent (see Appendix 1.3), which could potentially apply to the consent of the proposed development, no work shall commence on site until the planning authority has approved the precise routing of all access tracks as well as the detail of the appearance of the access tracks. Further details of the mitigation measures are provided notably in Chapter 7: Ecology and in Chapter 10: Hydrology Geology and Hydrogeology.

Substation Control Building

4.4.7 A new substation control building will be constructed adjacent to the existing control building at Paul's Hill Wind Farm (see Figure 4.1 in Volume 3 of the ES) and will be used for the management of the proposed development. The impact on the local environment is anticipated to be minimal and is assessed in the various chapters throughout the ES e.g. Ecology. Hydrology etc.

4.4.8 An appropriate designed system for the treatment of waste will form part of the control building plans, which will be detailed in the CMS and can be subject to a planning condition similar to the appropriate condition that applied to the existing Paul's Hill Wind Farm. An indicative layout for the control building can be seen in Figure 4.1, which is similar in layout to the existing control building. Any drainage from these facilities would be collected and treated prior to discharge via the Sustainable Drainage System (SuDS).

Off-site Substation

4.4.9 The underground 33 kilovolt (kV) cables routed from the proposed turbines would be brought together via underground cables to the Scottish and Southern Electric (SSE) substation at Glenfarclas, which will be the connection point for the proposed development. The electricity will be stepped up from 33 kV to 132 kV at the substation before being connected to the grid. There will be no further environmental impact during the operation of the substation associated with the proposed development. See below for the construction impacts during the construction of the cabling required for proposed development.

Grid Connection

4.4.10 The grid connection will be made at the SSE substation at Glenfarclas, which is a 33/132 kV substation, to be used by the proposed development. It connects to the overhead power line that travels through to the infrastructure at Boat of Garten. It is the transmission line that provides the grid connection for the existing Paul's Hill Wind Farm and has available capacity secured for the proposed development.

Cabling

4.4.11 The wind turbines envisaged for use on the proposed development will require external transformers linked to the substation through underground cable ducts (see Section 4.14 below for more information). These would generally follow the existing tracks where possible and will take into account due consideration for way leaving of existing infrastructure and environmental considerations. Along existing and consented tracks, where cabling is required pre-commencement surveys will be undertaken to give an up to date assessment of any ecological and any other environmental sensitivities and will inform the CMS. Pre-construction surveys and monitoring, as per the rest of the development will be carried out by the onsite Ecological Clerk of Works (ECoW). Cabling will also be carried out in a staged process, with vegetation and topsoil temporarily removed to be back filled as soon as the cables are laid. This method ensures vegetation is replaced as soon as possible and the temporary nature of the disturbance during the works is kept to a minimum.

4.4.12 Following the pre-commencement and pre-construction surveys and the staged nature of the cabling process the impact on the environment will be monitored by the ECoW.

4.5 PUBLIC ROAD ACCESS

4.5.1 Chapter 12: Traffic and Transport, of the ES details the public road network proposed for the transportation of turbine components. The proposed route is the same as that used for the existing Paul's Hill Wind Farm.

4.5.2 Access to the site from the public road network would follow the same route as used for the existing Paul's Hill Wind Farm.

4.5.3 Whilst it is acknowledged that details of any additional works that may be required along the public access route will have to be provided at a later stage, it is assumed for the purpose of determining this application that any such works will not have an adverse effect on the River Spey SAC. Whilst a variety of turbine options are being considered that have larger turbine components than have been previously been used for the Paul's Hill Wind Farm, at this time, it is expected that there will be options to enable the selection of turbine components and an appropriate mode of transport that enables delivery within the current parameters of the highway. This will be kept under review, as the consenting process progresses toward the proposed implementation of the wind farm. Additional information on this matter will be provided as required to the planning authority and other stakeholders.

4.5.4 The condition of the public road along the access route of the A95, A941 & B9138 would be surveyed and recorded prior to it being used for wind farm construction. Where required repair and maintenance work will be carried out on these roads during and following the construction period to rectify any identifiable damage which is directly attributable to the proposed development.

4.5.5 The impact of proposed development construction and operation traffic on the pubic road system in Moray is assessed in Chapter 12: Traffic and Transport, of the ES.

4.6 PREPARATORY FELLING

4.6.1 No preparatory felling would be required at the main wind farm site of the proposed development prior to the construction phase. Some felling will be required for grid cabling in the forestry block between Marypark and the substation at Glenfarclas, and these felling details will be provided when the exact details of the cable route are known. Pre-construction surveys along the length of the route will ensure that environmental impacts are kept to a minimum.

4.6.2 In accordance to the Woodland Removal Policy[1] compensatory planting will be undertaken, subject to SSE's approach to these matters, equivalent to the total area of trees removed for the purpose to laying the cable and not replanted.

4.7 CONSTRUCTION PHASE

4.7.1 Prior to the commencement of construction, a CMS would be produced setting out in detail the individual items of works associated with the construction of the proposed development. It would consider relevant planning conditions (such as the existing planning condition applied to the existing Paul's Hill Wind Farm if appropriate for Paul's Hill II) and ensure that each activity is carried out safely, in accordance with best practice and the relevant guidelines[2], and to minimise environmental impact, and in accordance with SEPA's pollution prevention guidance.

4.7.2 Typically, the document would cover the following topics:

- Site Health and Safety Plan;
- Method Statements and Risk Assessments to include for environmental considerations e.g. sympathetic construction methodology with regard to weather and ground conditions;
- Location and Description of Project;
- Consent and Regulation Approvals e.g. discharge of planning conditions;
- Pre-construction Survey Work Undertaken;
- Turbine Description/Specification;
- Construction Schedule;
- Public Highway Works;
- Site Tracks;
- Temporary Construction Compound;
- Crane Pads;
- Cable Trenches;
- Foundation Works;
- On-site Substation and Control Building;
- Borrow Pits;
- Monitoring - Ecological, Hydrological, Geotechnical and Archaeology;
- Emergency Procedures; and
- Pollution Control and Waste Management – potential waste material, materials that can be reused onsite or elsewhere and mitigation measures.

4.7.3 A Site Pollution Control and Waste Management Plan will be drawn up as part of the CMS. The Site Pollution Control and Waste Management Plan takes into account the types and quantities of waste arising from the proposed development during the construction, operation and decommissioning stages, offers options to avoid and manage the levels of waste and plans for disposal and details any necessary mitigation measures. This is discussed in more detail in Section 4.21 of this chapter. Further details on drainage, the control of pollution and the treatment of waste water are considered in Chapter 10: Hydrology, Geology and Hydrogeology of the ES.

4.7.4 The Site Pollution Control and Waste Management Plan will be written in accordance with relevant guidance including *SEPA Land Use Planning System Guidance Note 4*[3] and *Pollution Prevention Guidelines 5: Works and Maintenance in or Near Water: PPG5*[4]. The Site Pollution and Waste Management Plan will outline the mitigation measures that are proposed to prevent or reduce the likelihood of pollutant leaks at the proposed development. Waste management measures used to reduce the amount of waste produced as a result of the proposed development will be detailed as well as the methods used to ensure that such small amounts of waste are safely stored (see Section 4.21 below for more information on Waste Management). The potential to reuse waste on site as a method of waste reduction will be discussed in the Site Pollution and Waste Management Plan and discussed in detail within the Peat/Soil Excavation and Preparatory Felling Section of the CMS. In addition, measures put in place to ensure that waste generated from the construction phase of the proposed development does not have a significant cumulative effect on local waste management infrastructure will also be detailed.

4.7.5 Previous experience of agreeing the construction methodology during the post-consent/pre-construction stage has proved effective in securing accurate and realistic method statements. At this stage in the project, additional data is available for consultation in the form of detailed site investigations. Furthermore, the civil engineering contractor and the turbine supply contractor would have been chosen by this stage, enabling more detailed preparation of individual method statements. During the preparation of the CMS, correspondence and meetings with SNH, SEPA, the planning authority and other relevant consultees would be undertaken to review the working methods proposed and if necessary, incorporate changes. This iterative process of preparing the CMS ensures that when construction commences there is a documented procedure and risk assessment. This makes monitoring of the construction activities, either by the appointed site representative or by the various bodies associated with the preparation of the document, more straightforward.

4.7.6 Each section of the CMS will provide a detailed description of the task to be completed along with risk assessments, where necessary, covering items such as waste management and reuse, pollution prevention, control of waters, nuisance and material use.

4.7.7 The revised EU Waste Framework Directive 2008[5] introduced an exclusion from waste controls (see Section 4.21 below for more information on Waste Management) which applies to *"natural non-hazardous agricultural or forestry material"* that is deemed suitable for use in habitat creation/restoration or soil protection. As such, waste materials such as peat will be re-used on site where those materials are deemed suitable for reuse. Such materials will be reused on site during reinstatement works and habitat restoration.

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[1] Available online from: http://scotland.forestry.gov.uk/supporting/strategy-policy-guidance/woodland-expansion/control-of-woodland-removal (last accessed 26/02/2018)

[2] Good Practice during Wind Farm Construction, 3rd Edition. (2015) Scottish Renewables, SNH, SEPA, FCS and Historic Scotland. Available online from: http://www.snh.gov.uk/docs/A1168678.pdf (last accessed 14/09/2017)

[3] SEPA, (2014) Land Use Planning System SEPA Guidance Note 4.

[4] Pollution Prevention Guidelines 5: Works and maintenance in or Near Water PPG5. Available online from: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/290145/pmho1107bnkg-e-e.pdf (Accessed 05/02/2018)

[5] Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives. Available online from: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/218586/l_31220081122en00030030.pdf (last accessed 05/02/2018)

4.7.8 A Section of the CMS regarding the handling and storage of peat would be prepared which details the techniques used to maximise the potential for excavated material to be reused on-site during reinstatement works (see Section 4.18 below for more details) in accordance with recommended guidance such as *SEPA Guidance on the Assessment of Peat Volumes, Reuse of Excavated Peat and Minimisation of Waste*[6]*, Developments on Peatland: Site Surveys and Best Practice*[7] and in accordance with recommendations from a suitably qualified geotechnical designer, ecologist and hydrologist following a detailed site investigation. Peat slide risk (see Chapter 10: Hydrology, Geology and Hydrogeology, of the ES and Appendix 10.2 Peat Stability Risk Assessment in Volume 4 of the ES) assessment works have been carried out to provide input to the layout design and the results show that through geotechnical risk management, strict construction management and implementation of relevant control measures, the risk of peat failure across the site shall be reduced to residual levels. Additional detailed ground investigation would be conducted prior to construction. In respect of matters regarding construction methodology and peat stability at the site, the following general recommendations would be adhered to and would form part of the overall CMS documentation:

4.7.9 Environmental awareness to be provided to all staff entering on to site; this will include a basic environmental site induction:

- Avoid placing excavated material and local concentrated loads on peat slopes.
- Avoid uncontrolled concentrated water discharge onto peat slopes identified as being unsuitable for such discharge.
- Avoid unstable excavations. All excavations would be suitably supported to prevent collapse and development of tension cracks.
- Avoid placing fill and excavations in the vicinity of steeper slopes.
- During construction install and regularly monitor geotechnical instrumentation as appropriate, in areas of possible poor ground such as deeper peat deposits.
- Implement site reporting procedures to ensure that working practices are suitable for the encountered ground conditions. Ground conditions are to be assessed by a suitably experienced geotechnical engineer.
- Form a contingency plan to detail the level of response to observed poor ground conditions.
- Routinely inspect the development area by maintenance personnel including an assessment of ground stability conditions.
- Carry out an annual inspection of the site following completion of works by suitably experienced and qualified geotechnical personnel.
- Maintain stored peat in a suitable condition to minimise the peat drying out.
- Minimise the need to handle stored peat so as to reduce any drying or changes to the peat.

4.7.10 The layout of the site infrastructure has predominantly been sited on peat less than 0.5 m deep to minimise the impacts on the peat habitat sites. However, all procedures will follow best practice guidelines (see Appendix 10.2: Peat Stability Risk Assessment in Volume 4 of the ES for further information regarding peat stability at the proposed development).

4.7.11 Other sections relating to site-specific items including landslide hazard and geotechnical risk register, identified during the pre-construction phase could also form part of the CMS. It is intended that the CMS will be an evolving document and staged completion of the document would be undertaken in line with the progression of construction. Updating of the document to reflect changes in the methods to be used would also be carried out, as and when necessary.

4.7.12 Work on site shall not commence until the planning authority has approved the CMS and the detail of areas of construction associated with the proposed development, such as access tracks and borrow pits, in accordance with conditions 7.4 and 7.5 of Paul's Hill Planning Conditions (see Appendix 1.3). This will include specific details of timescales and contours for the implementation of the works, which will include the reinstatement of the development following the construction period. It shall also outline full details of baseline water quality, all construction which will be carried out on site, drainage, mitigation and restoration work and timetables.

4.8 WIND FARM CONSTRUCTION AND REINSTATEMENT TECHNIQUES

4.8.1 Construction of the proposed development would begin after a period following granted consent from the Scottish Ministers. The Applicant is seeking at least a within 3 year of consent commencement period condition to allow time for the discharge of conditions, procure the turbine equipment and associated infrastructure delivery and reach an investment decision for the project.

4.8.2 Section 4.7 above describes the construction phase in detail, however, the general order of on-site activities is summarised in Table 4.2. These items generally follow chronologically but some items will run concurrently.

4.8.3 Any construction works required at the on-site substation and the grid connection can be lengthy processes which will commence early in the construction programme to allow a live grid connection to coincide with the commissioning of the turbines.

Table 4.2: Construction Elements

Construction Elements
Site investigation
Mobilisation of civil and electrical contractor
Construction and upgrades to access and site tracks
On-site temporary construction compound and site storage compound
Track reinstatement
Excavation and construction of turbine foundations
On-site cabling
Construction of the substation control building
Preparation of crane pads
Installation of turbine transformers
Mobilisation of turbine supply contractor
Turbine delivery
Turbine erection
Reinstatement around turbines
Turbine fit-out
Connection to substation and grid connection
Commissioning of wind farm
Reliability testing
Demobilisation

4.8.4 Table 4.2 represents a simplistic process of the different construction elements given in chronological order. It should be noted that there will be a degree of overlap between individual elements. It should also be noted that these elements relate to permanent infrastructure. Some temporary works, are required during the construction

[6] Guidance on the assessment of peat volumes, reuse of excavated peat and minimisation of waste, SEPA. Available online from: http://www.scottishrenewables.com/publications/guidance-assessment-peat-volumes-reuse-excavated/ (last accessed 05/02/2018)

[7] Developments on Peatland: Site Surveys and Best Practice. Available online from: http://www.scotland.gov.uk/Resource/Doc/917/0120462.pdf (last accessed 05/02/2018)

phase, which are not included in this description due to their minor nature and duration, such as construction of temporary hardstanding areas for crane components, pads for supporting the rotors during construction or drainage measures in turbine excavations.

Construction Method Statement

4.8.5 A CMS, will be produced and finalised setting out the means by which each element of the proposed development will be constructed on site. A CMS will be produced when the main contractor has been selected and distributed for approval by the consenting/planning authority prior to commencement of works.

Construction Timetable

4.8.6 The construction period for the whole of the proposed development is envisaged to last for approximately twelve months, from commencement of construction through to installation and commissioning of the turbines, ending with site reinstatement (as shown on the construction programmes). Construction would consist of the following phases which, although presented in a typical sequence, may overlap or occur concurrently:

- Public highway improvements.
- Construction of a site storage compound for off-loading materials and components and to accommodate site offices and mess facilities. Depending on where the site storage compound is, normally some tracks would be required.
- Construction of site tracks and excavation of cable trenches.
- Construction of turbine and crane pads.
- Delivery and erection of turbine towers, and installation of nacelles and blades.
- Laying of on-site cabling.
- Installation of turbine transformers.
- Construction of new substation and control building.
- Testing and commissioning of the turbines and the wind farm electrical system.
- Site reinstatement (on-going during works).

4.8.7 A typical 12 month construction programme is presented in Table 4.3 below.

Table 4.3: Outline Construction Programme

Month > / Task Name	1	2	3	4	5	6	7	8	9	10	11	12
Mobilisation & site setup	X											
Site tracks & crane pads	X	X	X	X	X	X						
Foundations				X	X	X						
Forest felling and extraction						X						
Substation construction							X					
Cabling/electrical installation							X	X				
Turbine deliveries and erection									X	X	X	
Site reinstatement										X	X	X
Commissioning of wind farm											X	X
Demobilisation											X	X

* Pre construction surveys will take identify sensitive receptors, such as breeding birds, and where such receptors are found appropriate action will be taken to avoid these receptors applying a suitable buffer distance and/or applying appropriate mitigation and good practice.*It will be the aim of the construction programme to minimise construction activity during the winter months when there is high precipitation to ensure that run off and siltation is minimised.*

Typical Equipment Used at the Site

4.8.8 The following is an indicative list of equipment that would be required to construct the proposed development. The equipment would be in use on the site or stored on site within the construction compound. Where appropriate, vehicles such as cranes, trucks, excavators and bulldozers may be secured and left on the track at appropriate working areas overnight.

4.8.9 One 800/1000 tonne capacity crane and three 400/500 (or less) tonne capacity cranes. The 400/500 tonne cranes would be used for general construction duties such as the preparation of the reinforcement cages at the turbine bases and as tailing cranes for steerage during the turbine erection. The larger crane would be used for the turbine erection to lift the heavy components into place.

4.8.10 *Two 30/40 tonne 360 degree excavators.* These would be used at borrow pits for excavating stone and for excavation of turbine foundations. Ripper buckets or hydraulic breakers may be used for the excavators winning stone from the borrow pits.

4.8.11 *Three smaller excavators in the range of 10 to 20 tonnes.* These would be used for road construction and profiling and restoration of verges, turbine foundations and for excavation of cable trenches.

4.8.12 *One tracked bulldozer.* This would be used for a number of tasks such as stockpiling material from turbine excavations, management of stockpiles within the borrow pits, road construction, crane pad preparation and re-grading of the track running surface.

4.8.13 *Approximately four dump trucks.* These would be used for moving material around the site, e.g. for moving excavated peat or soils from cut site tracks to any stretches of floating track over deeper peat, and stone from the borrow pits for track construction.

4.8.14 *One or two heavy duty vibrating rollers.* The rollers are used to compact new roads, turbine foundation formations and are essential in compacting the crane pads and turbine backfill to the appropriate densities.

4.8.15 *One mobile concrete pump*. The concrete pump would be used on-site during the concrete works for the turbine foundations and the metering building. The pump would be lorry mounted and have a large boom to enable placement of the concrete within the turbine base excavations. The concrete wagons would reverse up to the rear of the pump and deliver the concrete into a hopper which would be connected to the pump. Using the pump allows a controlled and highly flexible method of pouring foundations.

4.8.16 *Two cable laying vehicles.* This would comprise a lorry or tractor with a revolving drum attachment for laying of cables in trenches alongside site tracks and a tracked excavator with drum attachment for the offsite cabling on stretches where it is not routed alongside a new or existing track.

4.8.17 *Two small trucks or four wheel drive vehicles with trailers*. This would be used for transporting of small loads around the site i.e. ducting pipes for cables in turbine foundations.

4.8.18 *Two minibuses and six four wheel drive vehicles.* These would be used for transporting construction workers and site managers around the site. These would be likely to leave the site on a regular basis transporting workers to and from their billets off-site.

4.8.19 A number of other vehicles would bring loads to the site, but would not be stored at the site. These would include lorries with flatbed extendable trailers carrying all turbine components including transformers, lorries carrying cabling, steel rods for concrete reinforcement and concrete lorries with revolving drums.

4.8.20 To prevent mud entering the public road system, if necessary, the wheels of all lorries leaving the site would be washed either using a manual spray or a wheel washing drive through unit.

4.8.21 *Cabins/Welfare Facilities.* Due to the requirement under Health & Safety Legislation and the CDM Regulations for welfare facilities on site and the exposed nature of the site, a number of cabins would be needed in the construction compound(s). These would have offices, canteens, drying-rooms, toilets and washing facilities. The units would be self-contained and no discharge of drainage would be made to the surrounding land unless otherwise agreed with SEPA and the local authority. Smaller, mobile self-contained units are likely to be required as work progresses throughout the site. These would be placed at suitable locations to tie in with the work interfaces as required. A typical layout of the construction compound area is presented in Figure 4.2 in Volume 3 of this ES.

4.8.22 *Fuel & Chemical Storage*. Fuel would be required for the vehicles, generators and other equipment on site. The storage facilities would typically comprise of a bunded concrete pit containing a lockable, bunded fuel tank and a separate lockable housing for the storage of construction chemicals. In addition, there would typically be a wheeled, double skinned bowser for transport of fuel to tracked vehicles. Drip trays would be used when refuelling vehicles on the site. Emergency spill kits would be kept on site adjacent to the fuel storage area and with the mobile bowser. A Principal Contractor (please see Section 4.17 below which details site representatives and support staff) would have a 24 hour emergency response company on standby in the event of a spillage incident. Vehicles would be refuelled at their working location to prevent loss of time and use of fuel returning to any designated refuelling areas. All previous stated measures would be used when refuelling vehicles, taking into account all guidance and pollution prevention measures, and the bowser operator would be suitably trained to deal with any spillage.

4.8.23 *Construction Materials.* A variety of materials would be utilised during the construction of the proposed development including, but not limited to; concrete, reinforcing steel, timber for joinery work and shuttering, stone and sand for road construction, general construction sundries, electricity cables. Wherever possible, the re-use of materials would be carried out, i.e. formwork to be re-used, excavated material from foundations to be reused in the preparation of crane pads and roads, topsoil for re-instatement and landscaping, etc. An indication of the materials used and the amount of resources (plant and labour) is generally included in the preparation of the CMS. Handling of potentially hazardous materials would be carried out in accordance with SEPA Pollution Prevention Guidelines, but particularly; Pollution Prevention Guidelines 6; *Working at Construction and Demolition Sites: PPG6*[8] concerning the delivery, handling and storage of materials. For example, the preparation of contingency plans, and briefing operatives on the procedure to follow if a spillage occurs would be covered by the appointed civil engineering contractor, displayed on site and contained within the CMS document prior to construction commencing.

4.9 SPECIFICATION OF TURBINES

Description

4.9.1 The selected turbines would be of a modern design with three blades mounted on a horizontal axis, attached to a nacelle, housing the generator, gearbox and other operating equipment. The nacelles would be mounted on a tubular tower which allows access to the nacelle. There are 2 different blade tip heights of turbines proposed; 6 turbines of an overall height from base to tip not exceeding 149.9 m and 1 turbine of an overall height from base to tip not exceeding 134 m– see Table 4.1 for further details. It is expected that the turbine cut in wind speed will be approximately 3m/s and will rotate clockwise.

4.9.2 Wind turbine towers will likely be constructed from steel and the blades from fibreglass.

4.9.3 It is proposed that the turbine tower, nacelle and blades will be finished in a semi-matt, off-white/pale grey colour. Typical turbine specifications, of the type being considered for use on the site, are presented in Figures 4.1a and 4.1b in Volume 3 of the ES indicating the different turbines heights proposed. In order to comply with Health and Safety requirements for the site, the Applicant would propose to apply identification numbers to the sides of the turbines. Numbers would be up to 1000 mm tall by 900 mm wide and would be positioned between 1.5 m and 3 m from ground level in order to be visible from the approaching access track. Details of these would be agreed as part of the CMS.

4.9.4 There may be a need for transformer housings to be situated adjacent to each of the turbine towers. The requirement for such structures, along with their dimensions, will vary based on the final turbine choice (some turbine types require two stacked transformer housings). Indicative design for typical transformer housing is shown in Figure 4.4 in Volume 3 of the ES.

4.9.5 In accordance with condition 7.6 of Paul's Hill Planning Consent, which could potentially apply to the consent of the proposed development, work will not commence on site until the planning authority has approved details of the external colours and finishes of the turbines and transformer housing.

Erection of Turbines

4.9.6 Two types of cranes are required for the erection of the turbines; 800/1000-tonne capacity cranes and 400/500-tonne capacity tailing cranes. The cranes would use the crane hard standing area as indicated in Figure 4.5 in Volume 3 of the ES.

4.9.7 Where possible, the delivery of the turbine components would be scheduled, weather dependent, to allow for direct lift off the transport trailers. Otherwise, turbine components would be stored on, or adjacent to, the crane pad areas. Alternatively, components may be delivered to the construction compound for internal distribution by a separate tractor unit. The tower sections would be erected, followed by the nacelle and hub. Following erection of the tower sections and the nacelle, the blades would either, be lifted and attached individually to the hub in position, or the hub and blades would be raised together, as a unit, and attached to the nacelle. The cranes would then move to the next turbine location.

Operation

4.9.8 Once installed and fully commissioned, the wind turbines would operate automatically and can be controlled remotely or from the on-site metering building. Regular visits will be made by technicians to infrastructure and turbines in four-wheel drive (4WD) vehicles or similar. In addition, longer servicing visits would be required, typically every six months, along with irregular unscheduled maintenance, as may be necessary. Occasional use of larger vehicles, such as cranes or lorries similar to those used during construction may be necessary, should there be a requirement for replacement of major turbine components.

4.9.9 Wind farm performance would be remotely monitored using the existing permanent anemometer masts, together with a Supervisory Control and Data Acquisition system (SCADA) that would monitor the individual turbines and the grid connection.

[8] Working at Construction and Demolition Sites: PPG6. Available online from: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/290139/pmho0412bwfe-e-e.pdf (last accessed 05/02/2018).

Environmental Considerations

4.9.10 All turbine transformers would be sited on bunded foundations that are able to contain 110 % of the oil contained within it. Any leaks from equipment within the nacelle would be contained within the turbine.

4.10 TURBINE FOUNDATIONS

Construction

4.10.1 Reinforced concrete gravity foundations are envisaged for use for the proposed turbines, as for the existing Paul's Hill turbines. Aggregate will be imported to site for the turbine foundations as it is anticipated that the aggregate won at the borrow pits will not be of sufficient quality for the turbine foundations (this has been the assumption to calculate traffic volumes as set out in Chapter 12: Traffic and Transport). This foundation type is typically an inverted T shape consisting of a large pad with protruding upstand left approximately 200 mm proud of the finished ground level. The pad is back filled with selected as-excavated material or stone material placed and compacted over the foundation. The base tower section of the turbine is subsequently connected to the foundation either via an embedded end can (short tower section) which is cast into the foundation or alternatively by using holding down bolts that are cast into the upstand section of the foundation. Stability of the turbine is provided through the weight of the foundation and the material replaced and compacted over it.

4.10.2 A typical turbine foundation specification is presented in Figure 4.6 in Volume 3 of this ES. Detailed design specifications for each foundation would depend on the site specific factors such as ground conditions, the specific turbine used and various other engineering considerations. Typically, a circular concrete base of approximately 24 m diameter usually suffices for turbines with the dimensions identified in ES Figure 4.3a and 4.3b in Volume 3 of the ES. Combined with the protruding upstand, the overall depth of the foundation would be around 3-3.5 m. Following construction of the foundations, a layer of peat, peat turfs and/or mineral soils that was excavated from the turbine foundation area would be reinstated. Transformers would be located within housings, as shown in ES Figures 4.1a, 4.1b and 4.8 in Volume 3 of the ES, adjacent to the turbines with power cables from the turbines passing through ducts cast into the foundation.

Environmental Considerations

4.10.3 Depending on the height of the water table at the foundation location, a drainage system may be installed around the foundation to prevent the build-up of water pressure under the foundation. Alternatively, in locations that were particularly sensitive to hydrological disturbance, a submerged foundation design could be employed which would not require a drainage system around the foundation.

4.10.4 Cement entering a watercourse can have a detrimental effect by drawing oxygen from the water and increasing its alkalinity. Although the site has been designed to avoid sensitive areas as far as possible, particular care would be taken pouring concrete at turbine foundations in the vicinity of watercourses and in areas of deeper peat. SEPA Pollution Prevention Guidelines 5*: Works and Maintenance in or Near Water: PPG5* as well as Pollution Prevention Guidelines 6; *Working at Construction and Demolition Sites: PPG6* would be adhered to and in addition SEPA would be consulted during the preparation of the CMS to ensure that the appropriate measures are put in place. This may include construction of a settlement pit within the construction compound or elsewhere for treating rinse water from concrete lorries and measures to prevent water from entering excavations in the vicinity of watercourses.

4.11 PERMANENT ANEMOMETER MASTS AND TURBINE ANEMOMETRY

4.11.1 Wind farm performance would be remotely monitored using existing permanent anemometer masts. A System Control and Data Acquisitions (SCADA) unit would monitor the individual turbines and allow remote technical control. The location of the existing permanent anemometry masts is shown on Figure 1.2 in Volume 3 of the ES.

4.11.2 In terms of additional anemometer requirements, each of the turbines would have an anemometer located on the nacelle in order to operate the turbines. Furthermore, it is proposed that several ground based laser anemometer devices of approximately 2.5 m in height (see Figure 4.7 in Volume 3 of the ES) and requiring a ground area of up to 25 m^2 of relatively level ground per unit are installed. These would be secured by means of a 2 m high palisade type fence for each unit and would have a mains power supply taken from the wind farm electrical network. The location and number of these devices to be installed would be agreed with the relevant planning authorities as part of the CMS at the time of construction.

4.12 CRANE PADS

4.12.1 Cranes would be required during the erection of each turbine at the turbine site, typically one 800/1000-tonne crane and three smaller 400/500-tonne cranes. To provide stable, firm ground for safe operation of the cranes during the installation of turbines, areas of hardstanding would be laid down on one side of each turbine foundation. These would need to be suitable for the outriggers of the respective cranes; leading to an area of approximately 140 m x 20 m for simultaneous use of all cranes (see Figure 4.5 in Volume 3 of this ES). Their locations will be finalised following further site investigation, but will maximise use of the access tracks, where possible, to minimise the carbon footprint of the proposed development. Typically, construction of the hardstanding areas would be similar to construction of the site tracks (on shallow soils) with 100-150 mm of topsoil removed and stored adjacent to the sites and remaining soil removed down to a suitable bearing stratum. Geotextile material would be laid down with crushed stone on top, to a depth of around 700 mm. The crushed stone would be sourced from the borrow pit locations identified indicatively in Figure 1.2 in Volume 3 of the ES.

4.12.2 Additional temporary hardstandings may be required at various stages during turbine construction and erection. This may include temporary hardstanding to facilitate the erection of crane components, lattice boom or turbine components e.g. rotor assembly.

Environmental Considerations

4.12.3 Prior to excavation for the crane pad, the vegetation layer would be carefully removed followed by any underlying peat. The crane pad will be excavated to form a level, solid platform with suitable graded stone excavated from borrow pits and turbine foundation excavations. The removed peat will either be relocated to the nearest restoration area or re-used to sympathetically reinstate around the turbine foundations or temporarily stored for relocation as soon as is practical (see Section 4.21 below). Stored peat would be prevented from drying out by storing the turfs close together to prevent drying of the edges. They will be monitored during storage and irrigated if required. On completion of erection and installation works, it is proposed that the areas of hardstanding will remain as it may be required during the operational phase of the proposed development. It is envisaged that the surrounding grassland vegetation will re-colonise the area. A diagram of a typical crane hardstanding can be found in Figure 4.5 in Volume 3 of the ES, although the final detail may vary depending on the exact make and model of turbine procured.

4.12.4 Reuse and storage of peat will be fully discussed within the CMS and will follow best practice contained within SEPA Guidance on the Assessment of Peat Volumes, Reuse of Excavated Peat and the Minimisation of Waste and SEPA Land Use Planning System Guidance Note 4.

4.13 SITE TRACKS AND BORROW PITS

Description

4.13.1 It is expected that new stone for upgrades to tracks and new tracks will be won from borrow pit locations identified onsite (this has been the assumption to calculate traffic volumes as set out in Chapter 12: Traffic and Transport). From initial site assessments, the indicative locations of these are shown on Figure 1.2 in Volume 3 of this ES; however final locations would be agreed as part of the CMS for the scheme and subject to detailed ground investigations to confirm suitability of material. Should we need any additional borrow pit locations a non-material

variation will be sought and any further borrow pit locations will be subject to the successful outcome of a relevant Mineral Extraction Licence application which would be made to the relevant authority. The final reinstatement of these borrow pits would be agreed with the local authority in consultation with SNH prior to reinstatement works commencing.

Construction

4.13.2 Approximately 3.739 km of new on-site tracks and 4.458 km of upgraded tracks would link the proposed turbines and infrastructure to the road network. The design philosophy behind the track layout has taken into account a number of factors including topography, hydrology, watercourse crossing, ground conditions and construction parameters and has been based on best practice methodology developed at other wind farm sites. It is proposed that existing and previously consented tracks are used where possible in order to reduce the need for construction of further tracks. Using existing tracks will also further reduce the degree of disturbance to the local environment. The proposed track layout has been designed following an onsite review and minimised the number of water crossings necessary and used as far as possible the existing infrastructure in place to minimise impacts on the environment.

4.13.3 The initial stripping of top soil for the tracks and placement of stone material for construction of tracks has the biggest potential to release sediment into watercourses. Therefore, using methods consistent with industry best practice sediment measures would be put in place ahead of the track construction activities. Sediment would be transported the furthest by existing surface water channels and manmade drainage systems, therefore proactive mitigation measures would require these to be identified prior to the track construction. Within the channels and drains and any necessary settlement ponds, silt traps would be constructed prior to track construction. The silt traps would likely be constructed using straw/hay bales or specialized siltation fencing, pinned into place, allowing water to either percolate through the bale or flow over. Where machinery is required for any of these up-front activities they would have low pressure bearing tracks. Sediment transport mitigation drainage systems would be subject to regular maintenance during the lifetime of the proposed development.

4.13.4 For construction of new sections of track, alternative methods would be utilised for different areas of the site, depending on site specific conditions. For each method, the track running width (excluding drainage channels and cable trenches) would generally be approximately 5 m wide, with the exact width depending on the local ground conditions. Track widths may be wider for short sections such as lengths with passing places and at sharp bends and track junctions. Excavated roads would be used for on-site track construction and for access tracks, where overlying soil or peat material would be removed with a foundation formed on the underlying glacial till or the weathered rock horizon, as shown in Figure 4.8 in Volume 3 of the ES. Where a localised area of peat averaging over 1 m depth for over 100 m in length occurs or for any other area where it is thought to be necessary following detailed design, floating roads could be used. As detailed in Figure 4.8 in Volume 3 of the ES, floating tracks would be constructed by placing layers of geogrid directly on top of the vegetation with as-dug or imported stone placed on top. Where more strength is required, due to ground conditions, additional geogrid layers or timber rafts would be used. Excess peat from excavated or cut track sections would be used to dress the batters of floating road sections.

4.13.5 In addition, there would be a requirement for drainage channels along one or both sides of each section of track depending on the ground conditions along each track segment (see Figure 4.9 in Volume 3 of the ES) to prevent the track itself acting as a watercourse. Tracks would be designed with a crossfall, towards the drainage ditches, to prevent build up of water on the running surface. It is important that the water flowing along the drainage ditch is not able to build up enough volume and velocity to act as a major sediment transport route. To prevent this happening, cross drainage pipes would be placed under the road at regular intervals. This also helps minimise the effect the road construction would have on the hydrology in the adjacent area and prevent concentration of water flow higher in the catchments' area than would necessarily occur. The drainage ditch would also be blocked just above the cross drainage inlet, thus preventing water from simply flowing past the inlet. Using stone available onsite, a head wall would be constructed to prevent erosion around the inlet. A silt trap would also be constructed at the inlet to the cross drainage, to minimise sediment entering the pipes. The outlet of the cross drainage would allow the water to filter through the adjacent vegetation.

4.13.6 For safety reasons, marker posts may be placed in the ground by the edge of the track in order to guide on-site vehicles during times of poor visibility or at night to turbines and site infrastructure. In addition, safety and/or directional signs would be placed at strategic points across the site area to inform members of the public that they are entering a wind farm area, make them aware of potential hazards and provide directions to emergency services should the need arise. Any signage would be agreed with the relevant authorities as part of the CMS.

4.13.7 Tracks between turbines and the anemometry equipment are required during the operational period of the proposed development to allow for routine maintenance operations and the replacement of larger turbine/electrical components.

Offsite Access Route

4.13.8 From the entrance to Marypark at particular locations (e.g. in the vicinity of Blacksboat Bridge) along this route additional works may be required for the delivery of the large turbine components. In accordance with condition 7.11 of Paul's Hill Planning Conditions (see Appendix 1.3), which could potentially apply to the consent of the proposed development, no work shall commence until approval has been granted by the planning authority that Blacksboat Bridge is able to take the required loadings.

4.13.9 In relation to wider works around Blacksboat Bridge and along other parts of the access route, the extent of these works are currently unknown (if indeed required), as a specific turbine model has not yet been selected. Whilst a variety of turbine options are being considered that have larger turbine components than have been previously been used for the Paul's Hill Wind Farm, in general, it will be the aim to select turbine components and an appropriate mode of transport that enables delivery within the current parameters of the highway. Once a turbine model has been chosen a detailed swept path analysis will be undertaken and appropriate engineering specifications will be formulated and included in the CMS. The environmental impacts of these works will be confirmed prior to construction, assuming as stated in section 4.5 that these will have no adverse impacts on the River Spey SAC.

4.14 ON-SITE AND OFF-SITE CABLING

Description of On-Site Cabling and External Turbine Transformers

4.14.1 The wind turbines envisaged for use on the proposed development will initially generate electricity at 690-1000 Volts. This needs to be converted to 33,000 Volts (33 kV) via a transformer located within the turbine or immediately adjacent to the tower of each turbine. Typical specifications for possible external transformer housings currently available are given in Figure 4.4 in Volume 3 of the ES. The indicative dimensions of the external transformer housing shown within Figure 4.4 in Volume 3 of the ES are 3 m (length) x 3 m (width) x 3 m (height). It is proposed that the external transformer housing will be dark green in colour; however this is subject to confirmation with the DGC. Any external transformer would be linked to the turbines through cable ducts in the turbine foundations. Underground cable routes between turbines and the substation compound would generally follow track routes. These would be placed up to 2 m from the track verge and drainage ditches.

Construction

4.14.2 The transformers would be linked to the on-site electrical substation and metering/control building via 33 kV underground cables placed in trenches. The route within the site would generally run adjacent to the route of on-site tracks where possible. The underground cables from the proposed development to the on-site substation will likely be routed across open ground away from site tracks. The route would be marked above ground with clearly identified posts, spaced at suitable intervals along the length. This would be agreed as part of the CMS.

4.14.3 Cables would be laid from a drum attached to a suitable vehicle. Each 33 kV cable would arrive as three insulated cores. These would be gathered in the trench and bound together along the entire length of the trench in a trefoil arrangement. Communication cables and earth tapes would also be laid in the same trench. The cables would be protected from mechanical damage by a sand bed and surround. Two layers of marker tape and/or tiles would be buried above the cables to prevent accidental excavation, and concrete marker posts would be placed at regular intervals to enable the cables to be located in the future.

4.14.4 Silt, scour and run-off could pose a problem as the cable trench can act as a preferential drainage channel. Backfilling of the trench should be carried out as soon as is practicable and the road drainage installed should be set up with suitable silt traps as the construction proceeds. In steep sections, impermeable plugs should be used in the cable trench to prevent the channel becoming a preferential drainage run, ideally using locally won clay material.

Environmental Considerations

4.14.5 In areas where the surrounding soils are very coarse gravel or peat, the cable trench footprint shall have a geo-textile wrap placed within it to prohibit fines migrating from the backfill into the surrounding sub-soils. These areas shall be identified on site during the commencement of the works. Where surplus mineral soil material is present, this shall be transported back to the borrow pit for use in the reinstatement and final profiling.

4.14.6 On-site cable trenches would be located to minimise the area of disturbance, up to 5 m beyond the edge of the site track in case of multiple circuits. Trench excavation, cable laying and backfill would be carried out in a continuous operation (minimising the length of trench open at any one time) and may occur subsequent to the construction of on-site tracks or after the erection of turbines. Prior to excavation, the topsoil/turfs would be stripped and placed to the side in a temporary stockpile. A trench would then be dug with a small excavator or backhoe to approximately 1 m in depth and up to 1.5 m in width.

4.14.7 Where cables cross contours on steeper areas of ground, clay plugs would be placed at intervals within the trench to prevent the trench acting as a water conduit. Figure 4.10 in Volume 3 of the ES gives an indicative outline of the cable trench. The final cable positions would be surveyed and supplied in 'as built' drawings for the Operations and Maintenance team.

4.14.8 Alternatively, cable ploughing may be adopted if ground conditions permit. The final choice of method will depend on the appointed contractor and the results of further site investigation.

4.14.9 Indicative details of the cable/service trenches are shown in Figure 4.10 in Volume 3 of the ES. Cables would be laid in sand for protection with warning tapes/boards placed above to mitigate the risk of unintentional excavation. Impermeable barriers (plugs) would be placed in the sand layer at regular intervals to prevent the trench acting as a water conduit with more frequent spacing between plugs on steeper gradients.

4.14.10 In all cases, the cables would be buried to a depth of approximately 1 m. Reinstatement would be carried out to relay the previously stripped top layer of peat turfs containing the seed bank, over the top of the cable trench. This reinstatement would be conducted following the backfilling of each cable trench section.

4.14.11 At track crossings and within concrete foundations, the cables would be laid within plastic ducts.

4.14.12 Existing watercourses should be monitored during the works, both to prevent water entering the excavation, and also for runoff and silt escaping and entering these. These may need temporary diversions/piping until the track is complete and the watercourses can be reinstated.

4.14.13 On decommissioning of the wind farm, on-site cabling can be removed, if required. Most modern cables are aluminium and are relatively benign and inert; over time these will break down to clay. These can be electrically isolated and left in-situ, as is common practise.

Offsite Cabling

4.14.14 An electricity cable will be laid between the onsite substation control building and the SSE grid connection point at Glenfarclas (see Figure 1.3 in Volume 3 of the ES), subject to confirmation and approval of exact specification from SSE as the grid operator. Onsite, this cable will be laid alongside the access track. From the site entrance through to Marypark it will be placed alongside the public road where possible. Where placement alongside the carriageway is not possible, such as from Marypark through to the Glenfarclas substation, it will be placed alongside the existing cable, subject to a safe buffer being observed to ensure health and safety.

4.14.15 It is a working assumption that any offsite cabling works will not have an adverse impact on the River Spey SAC.

4.15 CONSTRUCTION COMPOUND AND FACILITIES

Description

4.15.1 During the construction phase of the proposed development, a temporary compound and laydown site will be required. The construction compound will be built by carefully removing topsoil or peat turfs down to a firm substrate, laying down geotextile material and then constructing a working surface of stone extracted from the borrow pits. The topsoil/peat would be stored adjacent to the site for reinstatement or used elsewhere on the site. Final details of the compound and laydown area will be agreed as part of the CMS.

Construction of Compound

4.15.2 The dimensions of the compound would be approximately 60 m x 120 m and would be surrounded by a security fence. Due to the requirement under health and safety legislation, the Construction Design Management (CDM) Regulations for welfare facilities on site, and the exposed nature of the site, a number of cabins would be needed in the construction compound. These would have offices, canteens, drying-rooms, toilets and washing facilities. Smaller mobile, self-contained units are likely to be required as work progresses throughout the site. These would be placed at suitable locations to tie in with the work interfaces as required. A typical layout of the construction compound area is presented in Figure 4.2 in Volume 3 of the ES.

4.15.3 The compound would be used, where necessary, for temporary storage of the various components and materials which are required for construction.

4.15.4 A settling pit/concrete washout bay and wheel wash may be included near the construction compound. When concrete lorries have deposited their loads, there is a requirement to wash out the inside of the concrete drum. This requires a few gallons of water that would then be washed out from the drum into a settlement pit. The size of this pit would depend upon the flow of concrete lorries up to the site but would be lined with an impermeable sheet and granular fill to assist in the settling process. The construction compound will be reinstated at the end of the construction period. The stored subsoil and the stored topsoil would be laid over the geomembrane separating it from the underlying stone surface and then reseeded using a seed mix selected or where possible, turfs would be reinstated.

Environmental Considerations

4.15.5 Fuel would be required for the vehicles, generators and other equipment on site. The storage facilities would typically be comprised of a bunded concrete area containing a lockable, bunded fuel tank and a lockable housing unit for the storage of construction chemicals. In addition, there would typically be a wheeled, double-skinned bowser for transport of fuel to tracked vehicles. All construction equipment would be inspected on a daily basis to check for spillages. Drip trays would be used when refuelling vehicles on the site. Emergency spill kits would be kept on site adjacent to the fuel storage area and with the mobile bowser. Site operatives would be briefed on the emergency procedures to be undertaken in the event of a large spillage. The principal contractor would have a 24-hour emergency response company on standby in the event of a spillage incident. Vehicles would be refuelled

at their working location to prevent loss of time and use of fuel returning to any designated refuelling areas. All previous stated measures would be used when refuelling vehicles and the bowser operator would be suitably trained to deal with any spillage.

4.15.6 Cement entering a watercourse can have a detrimental effect by drawing oxygen from the water and increasing its alkalinity.

4.15.7 Turfs would be regularly monitored to prevent excessive desiccation. The subsoil would be removed and stored separately from the topsoil (or peat turfs). Geotextile and stone would be laid down to an approximate depth of 300-500 mm.

4.15.8 The units would be self-contained and no discharge of drainage would be made to the surrounding land unless otherwise agreed with SEPA and the local authority.

4.15.9 The settlement pit would be located away from watercourses with details included as part of the CMS following consultation with SEPA. Any drainage from these facilities would be collected and treated prior to discharge via the Sustainable Drainage System (SuDS). The washout bay would be maintained as necessary by replacing the granular fill with clean stone. At close of construction, all material within the washout bay would be removed from site and the area reinstated.

4.15.10 Diesel fuel would be stored on site for all construction vehicles. The storage tank would be placed within the construction compound and measures would be taken to mitigate the risk of leakage using either a double skinned tank, or the tank placed within a bund capable of containing 110 % of the maximum stored volume as required by the SEPA guidelines.

4.15.11 In line with SEPA guidance, appropriately competent operatives would be used for handling, storing and arranging for the disposal of potentially polluting substances. Licensed waste disposal companies would be used to dispose of potentially polluting wastes (see Section 4.21 below for more information on Waste Management). This will be discussed in greater detail within the Pollution Control and Waste Management Plan contained within the CMS.

4.16 SIGNAGE

4.16.1 There may be the need for signage at the proposed development as Paul's Hill II presents an industrial type operation in an isolated environment, in combination with safe day-to-day navigation, for emergency vehicles to navigate to emergencies, should they arise as well as aid the development of comprehensive risk assessment for those visiting and using the site. To improve recognised Health and Safety concerns on site, signage would consist of non-illuminated post and panel sign locations and non-illuminated turbine identification signs with a maximum of 3 signs per post facing at the proposed development.

4.16.2 The signage would comprise of two elements; directional signs and roundels displaying the site speed limit. The directional and speed roundel sign measure 300 mm x 400 mm x 3 mm respectively, which will be mounted on a 2500 mm x 76 mm grey aluminium pole as shown on Figure 4.11 in Volume 3 of the ES. The poles will be set within 600 mm deep concrete foundation as indicated in Figure 4.11 in Volume 3 of the ES. This will ensure the stability of the signs, in line with current guidance for such installations.

4.16.3 Figure 4.12 and 4.13 in Volume 3 of the ES illustrates the typical appearance and dimensions of the proposed signs. The sign fixtures allow back-to-back mounting and are used on sign locations where more than two signs are specified. The signs will be hard wearing using tamperproof fixtures, securing the signs in place. A high quality typeface is used to maximise readability. The signage is uncluttered and designed to be legible from vehicle or from foot.

4.16.4 The exact number of signs required at any of the post locations will be decided post consent, following a full review of the health and safety requirements.

4.17 EMPLOYMENT DURING CONSTRUCTION

Site Representatives and Support Staff

4.17.1 It is envisaged that the proposed development would be constructed employing a number of main contractors; probably one for the civil infrastructure works, one for the electrical works, and one for the supply, erection and commissioning of the wind turbines - all of whom would be coordinated and overseen by a project manager. A Principal Contractor will be appointed who will be responsible for the construction of the laydown areas, tracks, turbine bases and any modification required to the under construction substation and control building at Dun Hill. The Principal Contractor will formally appoint a Site Manager prior to construction who will be responsible for the day-to-day management of the site, including environmental responsibilities. In order to monitor the progression, a number of site representatives would be employed full time to ensure the Quality and Health and Safety aspects of the construction, and to ensure the development is carried out in accordance with the CMS methodologies. The site representatives would be individuals with previous experience of wind farm construction and would, as required, be supported on site by a suitably qualified Planning Monitoring Officer (PMO) and an Ecological Clerk of Works (ECoW). The site representatives would carry out regular checks on the site to monitor on-going activities, particularly when subcontractors are being used on site. In addition to this, and in conjunction with the ecologist/hydrologist, environmental audits of the site operations would be undertaken on a regular basis accompanied by representatives of the relevant contractors. Where necessary, additional specialists may attend the site including geotechnical representatives and PMO.

4.17.2 In line with guidance, appropriately competent operatives would be employed for handling, storing and arranging for the disposal of potentially polluting substances. Licensed waste disposal companies would be used to dispose of potentially polluting wastes.

4.17.3 During the construction period there could be approximately 30 - 40 construction operatives carrying out the works on site that have been described. There would be indirect local benefits arising from the construction phase, including use of hotels, B&Bs and other accommodation, hire of local equipment and plant, temporary employment of local work force and potential contracting of local subcontractors. The construction mobilisation would likely be spread over a 12 month period. See Chapter 13: Human Health and Population, of the ES for more information on the Socioeconomic impacts of the proposed development.

4.18 SITE REINSTATEMENT

4.18.1 Site reinstatement works will include the targeted re-use of peat. Prior to construction excavation works, consideration will be given to methods for handling and holding any excavated materials, particularly peat or peaty soils as peat has the potential to lose structural integrity upon excavation particularly when double handled or moved around the site (see Appendix 10.3: Peat Management Plan in Volume 4 of the ES).

Access Tracks

4.18.2 During track excavation works, where possible the vegetated top layer of material, which holds the seedbank, will be stripped and carefully set to the side of the worked area for re-use in the re-profiling and track verge reinstatement works. Where practical, if storage is required, the layers will be correctly stored in their respective soil/peat horizons, i.e. in the layers that they were stripped in, so when reinstated they can be put back in the correct order. If temporary storage of excavated materials is required, then such material will be stored safely and the method of storage will not lead to any areas of additional disturbance (see Appendix 10.3: Peat Management Plan in Volume 4 of the ES).

Cable Trenches

4.18.3 The reinstatement and storage of any excavated materials for the cable trenches will involve replacement of previously stripped soils, vegetated layers or turves. Timing of trench reinstatement works will also take into

account adjacent construction activities which may disturb any reinstatement works already carried out. The amount of time between the excavation of the trench and subsequent reinstatement following cable laying will be minimised as much as practically possible. The reason for this is that the longer the stripped turves are stored for the more they will degrade and become unsuitable for successful reinstatement. The optimum scenario for the cable trench works will be to ensure that no cable trenches are excavated until the electrical contractor has their cables ready for installation on site.

Turbine Foundations

4.18.4 Reinstatement methods associated with turbine foundations will include where practical the storage of peat turves and topsoil around the perimeter of the foundation excavation. A plan showing where the material is to be stored will be created prior to the works commencing. In areas where storage of the peat turves or excavated material adjacent to the works is not possible, then the material will be taken to the nearest agreed storage areas as soon as possible (see also Appendix 10.3: Peat Management Plan in Volume 4 of the ES).

Crane Hardstandings

4.18.5 Due to the requirement for crane hardstandings to remain in place, reinstatement of the crane pad will not take place. There will however be reinstatement of the area around the crane pad and any exposed batters using the stripping, storage and reinstatement methods described above (see also Appendix 10.3: Peat Management Plan in Volume 4 of the ES).

Construction Compound

4.18.6 All temporary construction areas will be removed and reinstated as quickly as possible following construction (although, these areas could be potentially reused throughout the life of the wind farm if major maintenance or repair is required). Following removal of temporary site accommodation, storage, equipment and materials, all areas will then be reinstated. The reinstatement will involve reprofiling/landscaping to ensure that the reinstated area blends in with the surrounding area. Suitable materials i.e. topsoil and peat will then be replaced over the area in appropriate horizons i.e. in the correct order. The material used for the reinstatement works (often that which was excavated for the temporary construction area), will be stored and managed adjacent to the temporary construction areas but away from watercourses and other sensitive receptors. It is highly probable that the temporary construction areas, such as the site compound will only be required for the duration of the construction period. Therefore, it is unlikely that any stripped turves would be suitable for reinstatement, as the vegetation would have decomposed if stored for any length of time. Vegetation will therefore be allowed to regenerate naturally (see Appendix 10.3: Peat Management Plan in Volume 4 of the ES).

Monitoring

4.18.7 Any re-use of peat across the proposed development area will be monitored to ensure that effects on the peat land environment are appropriately understood and subsequently reduced via any remedial works that can be undertaken. The details of any required monitoring would be discussed and agreed with SEPA, SNH and DGC prior to commencement. For further details see Appendix 10.3: Peat Management Plan in Volume 4 of the ES.

4.19 OPERATIONAL PHASE

4.19.1 The majority of the operation of the proposed development would be automated. Each individual turbine would operate independently of the other turbines. Turbine operation would be managed by control and monitoring systems. These systems control the rotational speed of each individual turbine and ensure its continued safe operation. Should any malfunction in operation occur or should wind speeds exceed safe limits, then the braking system of the wind turbine would automatically be applied and each turbine would shut down to a safe condition.

4.19.2 The operational lifetime of the project is envisaged to be up to 35 years from completion of commissioning to commencement of decommissioning. To ensure that turbines continue to operate with acceptable reliability (i.e. with each turbine capable of operating on average, between 95 % and 98 % of the time), regular pre-planned maintenance and servicing programmes are performed on each turbine. A typical maintenance programme is outlined below. Additionally, there may be a need to conduct irregular, ad hoc maintenance in the event of mechanical breakdowns.

4.19.3 Tracks and cranes pads giving access to turbines and the anemometer masts will be required during the operational period of the proposed development to allow for routine maintenance operations and occasional replacement of larger components.

Maintenance Programme

4.19.4 Maintenance regimes commonly begin shortly after commissioning with a 'post-construction' check on the torque levels of all bolts within the structure. This is normally performed 10 days after commissioning and again, 3 months after commissioning.

4.19.5 After this, minor and major service regimes continue on a six-monthly basis with both services being performed annually throughout the lifetime of the turbine.

4.19.6 Routine oil sampling and testing of lubricant maintains awareness of the integrity and condition of these lubricants. This allows cost-effective oil changes to be performed as the oil quality degrades. Routine oil sampling and testing of transformer oils is also performed in order to maintain awareness of the integrity of the electrical properties of these oils.

4.19.7 Maintenance of the high-voltage switchgear will also be conducted routinely and annual checks will be performed.

4.19.8 In the case of major component maintenance being required, such as generator or blade replacement, large vehicles similar to those used during construction may need to return to site. These would be subject to similar conditions of planning as agreed for the initial construction period. From time to time, when such maintenance is being undertaken, it may be necessary to restrict access to areas close to the replacement turbine components in order to maintain the health and safety of visitors. In such cases, the areas affected would be clearly marked and fenced and alternative routes would be provided for any visitors seeking passage through the proposed development area, where necessary.

4.19.9 All maintenance of any equipment item would be performed according to the Original Equipment Manufacturer's stated schedules, Health and Safety and Construction, Design and Management procedures.

4.19.10 All maintenance would also occur according to the environmental procedures aforementioned in this chapter.

Storage and Use of Polluting Substances

4.19.11 Storage of polluting substances at the site during the operational period of the proposed development would only take place where agreed with the relevant authorities in accordance with Control of Substances Hazardous to Health (COSHH) regulations. Generally, substances of this nature are transported in minimum quantities on an 'as required' basis.

Employment During the Operational Phase

4.19.12 It is envisaged that the turbines at the proposed development would be included within a wider portfolio of operational wind turbines and that persons and/or technicians would be on site as required. For the first few years of operation the turbines would be expected to be under warranty and maintenance would be performed by the turbine manufacturer. During these years there would be approximately 2-4 technicians dedicated to the site. During annual servicing this would increase temporarily with up to 8 technicians on site. The site would also support a site manager to be based in the local area. Other contract personnel would attend the site as required

to maintain the civil and electrical infrastructure as well as carrying out duties in relation to ecological monitoring and reporting. Site personnel would make use of the onsite control building, which has been designed to include office space and welfare facilities.

4.20 DECOMMISSIONING

4.20.1 At the expiry of the consent or the end of the wind farm's useful life, it is proposed that the turbines, transformers and the on-site substation would be removed. The upper section of the turbine foundations, to a depth of at least 1 m, would be removed and backfilled with appropriate material. Peat or topsoil would be replaced and the area reseeded (see Section 4.18 above for information on site reinstatement and 4.21 below for more information on Waste Management). This process will be discussed in greater detail within the Pollution Control and Waste Management Plan contained within the CMS. Tracks will be left and allowed to grass over, or would be covered with soil and reseeded. Detail of reseeding could be provided in accordance with condition 7.7 of Paul's Hill Planning Conditions (see Appendix 1.3). At least six months prior to the decommissioning of the site, a Decommissioning Method Statement would be prepared, for agreement with the local authorities and relevant consultees. This is in accordance with condition 7.2 of Paul's Hill Planning Conditions (see Appendix 1.3), which could potentially apply to the consent of the proposed development, where it states that within this time all wind turbines, ancillary equipment and buildings shall be dismantled and removed from the site and land shall be restored in accordance with a restoration scheme.

4.21 WASTE MANAGEMENT

4.21.1 The proposed development will produce small amounts of general, municipal and hazardous waste during its construction, operation and decommissioning.

4.21.2 Waste materials generated during the construction phase include excavation waste such as vegetation, forestry residues, soil, stone, rock and similar materials. Excavated materials can be reused on site or elsewhere if it is deemed suitable for reuse. Excavated peat associated with development on peatland is not classed as waste if it is deemed suitable for a required and predetermined end use as part of construction works and reinstatement on a site. Other construction waste streams include municipal waste from welfare facilities, including food waste, paper, plastics, glass, cardboard, paper, and other typically domestic refuse. Industrial waste chemicals, fuel, oil and polluted water from plant, vehicle and wheel washes may also be generated as a result of the proposed development.

4.21.3 The operational phase of a development is unlikely to generate significant amounts of waste except for minor quantities of material collected during routine maintenance inspections. Waste streams during this phase include municipal waste, waste chemicals, fuel and oil, sewage and polluted water from vehicle and wheel washes.

4.21.4 During the decommissioning phase of a development wastes include demolition waste, turbine components, electrical cabling as well as municipal waste, waste chemicals, fuel and oil, sewage and polluted water. Wind turbines and electrical cables can be re-used subject to potential ready markets for the material.

4.21.5 Measures will be put in place to ensure waste generated from the proposed development is kept to a minimum and does not have a significant cumulative effect on local waste management infrastructure. Such measures will be detailed fully within the CMS.

4.21.6 Embedded mitigation to reduce the quantity of waste from the proposed development will include the design of the proposed development in such a way that new turbines can be accessed by existing access tracks wherever possible, minimising the need to construct additional access tracks and reducing the potential for waste. All construction and decommissioning activities will be planned effectively to ensure that any materials associated with these activities are predicted well in advance, reducing the chance of over-ordering of materials which would result in waste.

4.21.7 Materials will be reused on site or elsewhere and materials will be sent for recycling where recycling facilities are available. Other measures to ensure that waste materials sent to local waste management facilities sent to landfill are kept to a minimum include the nomination of an approved person(s) to be responsible for waste management on site; this will include the coordination of waste collection to suitable disposal and/or recycling facilities. In addition, a system to record and monitor waste will be implemented, keeping a record of re-use, recycling and disposal. It may also be possible to schedule certain activities that generate large volumes of waste to avoid overloading local infrastructure if other construction projects in the area are also producing large volumes.

4.21.8 Pollution prevention measures will also be put in place and these will be detailed fully within individual chapters of the ES and within the CMS. Pollution prevention measures include:

- Storage of waste materials within the construction compound only. If waste materials are generated outside the construction compound they will be taken to the compound on a daily basis.
- All waste products will be removed from site by registered waste carriers and taken to a waste management facility permitted to receive each specific waste type.
- Bonfires and the burning of waste products will be prohibited on site.
- Labelled, double skinned waste tanks will be utilised for the storage of waste oils onsite.
- The waste storage area will be isolated from surface drains and bunded to contain any spillages
- A wastewater collection system will be used to prevent contamination of local water courses.

4.22 HEALTH AND SAFETY

Health and Safety of Construction Workers

4.22.1 The construction site will be managed and operated in accordance with Health and Safety at Work etc. Act 1974 and comply with relevant Health and Safety Regulations, including:

- The Management of Health and Safety at Work Regulations 1999
- Construction (Design and Management) Regulations 2015
- Electricity Safety, Quality and Continuity Regulations 2002

4.22.2 In awarding any civil, electrical or other contracts for the construction of the proposed development the appointed contractor is obligated by law to follow the CDM Regulations implemented by the Health and Safety Executive (HSE). These are based on standard procedures that are adapted to take account of all site specific requirements. The Regulations require due consideration is given to construction workers and the public, with risk assessments and method statements created to cover all risks identified including access rights across the site.

4.22.3 A CDM Coordinator would be contracted by the developer to make sure all the regulations are correctly implemented, and to compile a health and safety file, which would be used in the operation and maintenance phase of the proposed development. The developer remains ultimately responsible and would be required to provide a timescale and start date for the project, to allow the CDM coordinator to review the adequacy of the contractor involved against the description of the required works. Additionally, a developer representative would be on site during the construction period. This person would be empowered to halt any or all construction works if they believe correct health and safety procedures are not being adhered to. Similar procedures for site workers, visitors and civilians must be drawn up for the operational phase of any wind farm. The HSE can question any aspect of the project and visit site at any time if they have any concerns.

Safety of the Public

4.22.4 Throughout the construction phase of the proposed development the relevant statutory requirements would be adhered to. All potentially hazardous areas would be fenced off and all unattended machinery would be stored in the site compound or immobilised to prevent unauthorised use. In addition, temporary construction safety signs

would be placed at each possible entrance to the site and in areas where there may be further danger, e.g. around settling lagoons and borrow pits.

4.22.5 Throughout construction, measures to manage diversion routes would be put in place. The diversion routes would be clearly marked and for safety reasons would direct the user away from any areas of construction.

Operational Phase

4.22.6 Wind farms have a proven track record for safety. A very small number of wind turbines have been known to suffer mechanical damage through lightning strikes or mechanical failure. Experience on existing sites has shown that allowing the public to access an operating wind farm does not lead to a compromise with respect to safety issues.

4.22.7 Companies supplying products and services to the wind energy industry operate to a series of international, European and British standards. A set of product standards for wind energy equipment has been developed by the International Electrotechnical Commission - IEC 16400. There are a number of British Standards that correspond to it, for example; BS EN 61400-1 ed3.0: 2005 “Wind turbines – Part 1: Design requirements”.

4.22.8 The developer would commit to installing wind turbines and components that meet BS EN 61400-1 ed3.0.

4.22.9 Public access to the proposed development Area after construction has been completed would remain the same as the current situation. Appropriate warning, directional and identification signs would be installed directing to and on the turbines, transformers and onsite electrical control building, and access to these would be restricted to wind farm personnel. At all times these facilities would be locked. Additionally, safety and/or directional signs would be placed at strategic points across the site area to make people aware of potential hazards and provide direction for emergency services should the need arise. Any signage would be agreed with the relevant authorities as part of the CMS (see Section 4.21 above).

4.22.10 No resulting safety risks are expected as a result of public access to the proposed development area. Turbine models being considered for the site would operate automatically and have sensors to detect any instabilities or unsafe operation during high wind speeds. Should sensors placed within the nacelle and tower of the turbine detect any other malfunction in operation or should wind speeds increase over maximum operational thresholds, the brakes would be automatically applied in order to rapidly shut the turbine down.

4.22.11 If the cause of the shutdown was high wind speeds then the turbine would automatically begin operation once the average wind speed reduced to within operational levels. Under other causes of shutdown, e.g. through malfunction, the turbine would remain shut down and in a safe condition (i.e. commonly with the blades orientated 90° to the wind direction) until manually restarted by a member of the Operations and Maintenance (O&M) team following satisfactory inspection and/or repair. This procedure ensures safe operation of turbines to protect members of the public walking, cycling or riding past turbines during the operational phase. In addition, the vibrometers in the nacelles would detect rotor imbalance in blades caused by icing and the wind turbine’s control and monitoring system would shut the turbines down under these conditions. The turbines are also equipped with lightning protection equipment so that strikes will be conducted from the nacelle down the tower into the earth.

4.22.12 Consideration will be given during the procurement of turbines to minimise the residual impact of ice throw. This is considered further in Chapter 13: Human Health and Population, of the ES.

4.22.13 The safety features and record of wind turbines are identified above, and it is concluded that the proposed development would not present a significant safety risk to the public.

4.23 CONCLUSION

4.23.1 This chapter has set out a description of the proposed development and provided details of the activities that will be undertaken throughout the construction, operation and decommissioning phases of the proposed development.

4.23.2 There is sufficient detail to provide consultees with a reasonable understanding of proposed Paul’s Hill II Wind Farm development. Further construction details will be provided in the CMS, which will be submitted by the principle contractor for approval by the planning authority prior to the construction of the wind farm.

Document history

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Chapter 5

Approach to the Environmental Statement

Contents

Glossary

Term	Definition
Baseline	The existing conditions that prevail against which the effects of the proposed development are compared
Environmental Impact Assessment	Environmental Impact Assessment (EIA) is a means of drawing together, in a systematic way, an assessment of the likely significant environmental effects arising from a proposed development.
Environmental Statement	A document reporting the findings of the EIA and produced in accordance with the EIA Regulations
The Existing Paul's Hill Wind Farm	The 'existing Paul's Hill Wind Farm' refers to the operational Paul's Hill Wind Farm
The Proposed Development	The proposed Paul's Hill II Wind Farm
The Proposed Development Area	The red line boundary (application area)

List of Abbreviations

Abbreviation	Description
EIA	Environmental Impact Assessment

Abbreviation	Description
ES	Environmental Statement

5.1 ENVIRONMENTAL IMPACT ASSESSMENT (EIA) METHODOLOGY

Overview of the EIA Process

5.1.1 This chapter of the Environmental Statement (ES) aims to outline the process and methodology regarding the application of Environmental Impact Assessment (EIA) used during the preparation of this ES to guide the specific elements of site assessment and design.

5.1.2 The EIA is based on various legislation, in particular, the Electricity Works (Environmental Impact Assessment) (Scotland) regulations 2000 as amended by the Electricity Works (Environmental Impact Assessment) (Scotland) Amendment Regulations 2008 (herein referred to as the EIA Regulations). The EIA Regulations outline the process of an EIA and the criteria that would determine if an EIA is necessary or not, the relevant environmental studies and statements, how the information is evaluated by the Scottish Ministers, Planning Authority and consultative bodies and how this is implemented through the consent under Section 36 of the Electricity Act 1989. Under the EIA regulations, the proposed development is classed as Schedule 2 development, requiring the project to be screened for EIA. The Applicant determined following an internal screening process that an EIA was required.

5.1.3 As the Scoping Report was submitted prior to 16th May 2017, the ES will be submitted under 2000/2008 EIA regulations. The ES will however include a chapter on the impact on human health and population in accordance with the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017. This can be found in Chapter 13: Human Health and Population of the ES.

5.1.4 The key stages of the EIA process and methodology, following site selection and definition of the development characteristics are explained in more detail in the following chapters.

5.2 SCOPE OF THE ENVIRONMENTAL STATEMENT

5.2.1 The nature of environmental and social effects can be divided into a number of categories. Firstly, there are categories of environmental and human receptors (e.g. breeding birds, migrating birds, ecological habitats, cultural and archaeological sites and artefacts, human settlements, noise sensitive properties) that may be affected. Secondly, there are the various stages and components of the proposed development which may have differing characteristics with relation to the environment (e.g. the construction, operation and decommissioning stages and the turbines, tracks, power cables and substation), as separate components of the proposed development.

5.2.2 Scoping exercises were undertaken to identify the environmental effects that might result from a development with the characteristics defined during the early stages of the development process, with reference to the environmental receptors specific to the area in the vicinity of the proposed development. An essential part of this involved identifying the sensitive environmental receptors of the proposed development and its surroundings.

5.2.3 In defining types of environmental effects, the lead consultant, Natural Power and its technical associates, have made use of its experience in carrying out EIA for onshore wind farm proposals. A list of the consultants involved and the topics assessed is set out in Chapter 1: Introduction, of the ES. In addition, reference was made to guidance documents issued by government agencies and non-governmental organisations. Specific guidance documents which have been referred to for individual elements of the EIA are detailed in the relevant chapters within this ES. A scoping report providing the proposed scope of the EIA was drawn up and submitted to The Energy Consents and Deployment Unit of the Scottish Government. The responses have been detailed in Chapter 3: Site Selection and Design Evolution, of the ES and the full Scoping Opinion Request submitted to and Final Scoping Opinion Response received back from the Scottish Government is presented within Appendix 1.1: Paul's Hill II Scoping Report and Technical Appendix 1.2: Scottish Government Final Scoping Opinion in Volume 4 of the ES.

5.3 IDENTIFICATION OF THE BASELINE ENVIRONMENT

Data Collection

5.3.1 A number of existing data sources were collected and reviewed prior to the initiation of survey work targeted directly on gathering data for the EIA of the proposal. This included information and understanding of the site and surrounding area from the existing Paul's Hill Wind Farm. It was understood that existing data sources would, in most cases, be unlikely to provide sufficient data alone to use in the EIA but would provide a valuable initial stage with which to form methodologies for further survey.

5.3.2 Details of existing data sources and coverage are presented within the relevant chapters of this ES.

Baseline Surveys

5.3.3 Baseline surveys were carried out by specialist consultants in a number of different study areas. These were aimed at gathering sufficient data to form a picture of the current status of the environmental and human elements in the vicinity of the proposed development. The ultimate aim was to allow the prediction of the potential effects of a subsequent detailed development proposal upon these elements. Baseline survey methodologies and coverage are described in detail in the relevant assessments in chapters of this ES.

5.4 SITE DESIGN, ASSESSMENT OF POTENTIAL IMPACTS AND MITIGATION

Site Design and Identification of Effects

5.4.1 The consultation process, baseline studies and surveys identified technical constraints and any potentially more sensitive environmental receptors within the proposed development area. The goal was to design a wind farm within the boundaries of technical and economic constraints that would avoid any unacceptable environmental and socio-economic impacts.

5.4.2 In order to minimise unacceptable significant adverse environmental effects, the assessment and design of the proposed development followed an iterative approach. With this type of approach, potentially significant adverse effects are identified during the assessment process and the design of the proposed development is modified in order to avoid, reduce or mitigate these effects as far as reasonably practicable.

5.4.3 Further details of the site design process are discussed within Chapter 3: Site Selection and Design Evolution, of the ES.

Determining Significant Impacts

5.4.4 The outline methodology for assessing significance was developed after consideration of relevant guidance/regulations including:

- Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000 as amended by the Electricity Works (Environmental Impact Assessment) (Scotland) Amendment Regulations 2008;
- Guidelines for Landscape and Visual Impact Assessment 3rd Edition: E & FN Spon (2013) published by the Institute of Environmental Management and Assessment and the Landscape Institute; and
- Guidelines for Environmental Impact Assessment (2004) Institute of Environmental Management and Assessment (IEMA).

5.4.5 In determining the significance of potential residual effect, the magnitude of change arising from the proposed development is correlated with the 'sensitivity' of the particular environmental attribute under consideration. Magnitude of change is evaluated in accordance with the definitions set out in Table 5.1 below.

Table 5.1: Example definitions of 'magnitude' of change

Definitions of 'magnitude' of change	
High	Total loss or major alteration to key elements/features of the baseline (i.e. pre-development conditions)
Medium	Partial loss or alteration to one or more key elements/features of the baseline (i.e. pre-development conditions)
Low	Minor shift away from baseline (i.e. pre-development) conditions
Negligible	Very slight change from baseline (i.e. pre-development) conditions.

5.4.6 Where applicable, in carrying out individual assessments, a scale of increasing 'sensitivity' of the environmental or social receptor is defined. This may be defined in terms of quality, value, rarity or importance to other elements, and be classed as low, medium or high. Table 5.2 below provides an example table to illustrate this concept.

Table 5.2: Example of Sensitivity

Examples of Sensitivity	
High	Elements of international / national importance generally designated for protection through national legislation / policy
Medium	Elements of regional / local importance that are not designated but are generally protected by local policy
Low	Elements of local value that can generally tolerate change

5.4.7 For certain assessment area, guidance can be taken from the value attributed to elements through designation or protection under law i.e. landscapes or ecological resources given various levels of protection under planning law. Where assessment of this nature has taken place, the correlation of magnitude against 'sensitivity' determines a qualitative expression for the significance of the effect. This is demonstrated in Table 5.3.

Table 5.3: Example Significance Matrix

Significance Matrix			
MAGNITUDE OF CHANGE			
High	Moderate	Moderate/Major	Major
Medium	Minor/Moderate	Moderate	Moderate/Major
Low	Minor	Minor Moderate	Moderate
Negligible	Negligible/Minor	Minor	Minor/Moderate
	Low	**Medium**	**High**
			SENSITIVITY OF RECEIVING ELEMENT

5.4.8 Although significance is usually assessed in terms of varying degrees, those effects indicated as 'major' and 'moderate/major' are likely to be regarded as being equivalent to 'significant effects' when discussed in terms of

the EIA Regulations[1]. Following the iterative design process adopted during the design of the proposed development, the significance of each effect would be confirmed or reassessed.

5.4.9 The significance of an effect may also be affected by its duration (e.g. the length of the construction period) and by its reversibility i.e. the degree to which a site could be returned to its baseline conditions following decommissioning.

5.4.10 Each of the impact assessments detailed in the relevant chapters of this ES have been generally formulated in a similar way, giving an evaluation of the baseline conditions, the magnitude, sensitivity and significance of impacts and then the residual impacts following the implementation of the stated mitigation measures and resultant beneficial effects.

5.4.11 A view on the acceptability of the proposed development in policy terms is provided in the accompanying Planning, Design and Access Statement. With regards to this, it must be noted that a significant impact does not necessarily mean an unacceptable impact in policy terms. In addition, significant impacts can also be positive as well as negative.

Cumulative Assessment

5.4.12 The EIA Regulations require the likely cumulative impacts of the proposed development to be assessed as part of an EIA. These can be broadly defined as impacts that result from incremental changed caused by other developments, plans, or projects together with the proposed development. The EIA regulations state that all likely significant cumulative effects resulting from the existence of the development, use of natural resources and the emission of the pollutants, the creation of nuisances and the elimination of waste should be considered within the EIA.

5.4.13 The proposed methodology for assessing cumulative impact throughout the EIA follows the guiding principles outlined in the European Commission guidance[2] for the assessment of Indirect and Cumulative Impacts. The detailed approaches to cumulative assessment are varied according to each specific ES chapter. Appropriate spatial scales are defined within these chapters and are defined following their particular methodologies, which follow current available guidance.

Mitigation

5.4.14 The purpose of mitigation is to, where applicable, design out or reduce the significance of unacceptable adverse effects to an environmentally (or otherwise) acceptable level; their acceptability is deemed with respect to regulatory policy and/or other considerations.

5.4.15 For the purposes of this EIA, mitigation has been approached in two levels through design mitigation in the first instance and impact mitigation where required, which are described in the following passages.

Design (Embedded) Mitigation

5.4.16 Measures envisaged to prevent or reduce any significant adverse effects were identified and incorporated into the design as environmental and visual assessments were developed. The design process continued until it was considered by the Applicant and consultants involved in the production of the ES that the most appropriate wind farm design has been developed. In this way, the proposal presented here can be seen to have embedded measures, to prevent or reduce significant adverse effects directly into the design process (design/embedded mitigation), and the findings and conclusions of the environmental assessments reflect the incorporation of those measures.

Impact Mitigation

5.4.17 Measures which are envisaged to prevent, reduce or offset significant adverse residual effects unavoidable through design, were also identified through the EIA process. The process of assessment has considered the potential effects of the proposed development and those effects, where applicable, will have measures proposed which apply best practice and guidance recognised within the industry to attain environmentally acceptable levels, or those which are deemed acceptable through determination.

5.4.18 In some cases, individual effects have not been considered to require automatic impact mitigation. However, as a means of best practice and to take into account the views and comments expressed via specialist consultants and consultees, impact mitigation was applied when considered appropriate.

[1] EIA Quality Mark Article, EIA and the Search for Significance in EIA, IEMA.

[2] European Commission (1999) Guidelines for the assessment of Indirect and Cumulative Impacts as well as Impact Interactions, available at: http://ec.europa.eu/environment/archives/eia/eia-studies-and-reports/pdf/guidel.pdf (accessed on 21/09/2017)

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Chapter 6

Landscape and Visual Impact Assessment

Contents

See section 6.1.3 for the list of appendices and figures (including visualisations).

Glossary

Term	Definition
Aesthetic Elements	The key aspects of the landscape which contribute to its appearance (previously composition), such as: • scale • enclosure • diversity • texture • form • line • contour • balance • movement • pattern
Analysis (Landscape)	The process of breaking the landscape down into its component parts to understand how it is made up.
Analysis (Visual)	The process of identifying the nature of visibility in an area, which is determined through topographic analysis.
Assessment (Landscape)	An umbrella term for description, classification and analysis of landscape.
Baseline	The landscape and visual character of the study area as it exists at the commencement of the assessment process – i.e. prior to the development proposal under consideration.
Constraints	Important resources and receptors that may form constraints to development.
Countryside	The rural environment and its associated communities (including the coast).
Cultural and social factors	The elements of the landscape which are the result of human activity, e.g.: • Land use management • Character of settlements and buildings • Pattern and type of fields and enclosures • Rights of way /footpaths • Artistic/literary associations
Cumulative Effects	

Term	Definition
Digital Terrain Model (DTM)	Effects arising from the additional changes to the landscape or visual character caused by a development when seen in conjunction with other developments (associated with it or separate to it).
Digital Surface Model (DSM)	Computer generated 3 dimensional model based on aerial survey of ground surface (e.g. Ordnance Survey Profile data). Often utilised as a basis for visibility modelling over large areas.
Diversity	Computer generated 3 dimensional model based on aerial survey of ground surface, tree canopies, built structures etc.). Often utilised as a basis for visibility modelling where the effects of intervening structure and/or vegetation need to be incorporated.
Effect:	Where a variety of qualities or characteristics occur.
Element	The result of an impact on a landscape or visual receptor.
Environmental Fit:	A component part of the landscape (e.g. roads, hedgerows, woods)
Field Pattern	The relationship of a development to identified environmental opportunities and constraints in its setting.
GIS (Geographic Information System)	The pattern of hedges and walls that define fields in farmed landscapes.
Horizontal Angle Subtended	Computerised data base of geographical information that can easily be updated and manipulated.
Key characteristics	The angle measured in degrees from the left most visible part to the right most visible part of any development.
Impact	The elements of the landscape and/or their inter relationship which form the defining components of the landscape.
Indirect Impacts	The change arising for a landscape or visual receptor as a result of some form of alteration to the baseline.
Landcover	Impacts on the environment, which are not a direct result of the development but are often produced away from it or as a result of a complex pathway. Sometimes referred to as secondary impacts.
Landform	Combination of land use and vegetation that covers the land surface.

Term	Definition
Landscape	See Topography.
Landscape Capacity	Human perception of the land conditioned by knowledge and identity with a place.
Landscape Character	An area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors. The degree to which a particular landscape character type or area is capable of is able to accommodate change without unacceptable adverse effects on its character. Capacity is likely to vary according to the type and nature of the changes being proposed. The capacity of the landscape is derived from a combination of Landscape Character Sensitivity, Visual Sensitivity and Landscape Value.
Landscape Character Type (LCT)	The distinct and recognisable pattern of elements that occur consistently in a particular type of landscape, and how this is perceived by people. It reflects particular combinations of geology, landform, soils, vegetation, land use and human settlement. It creates the particular sense of place in different areas of the landscape.
Landscape Character Area (LCA)	A landscape type will have broadly similar patterns of geology, landform, soils, vegetation land use, settlement and field pattern discernible in maps and field survey records.
Landscape Fabric	A geographically specific area of an identified landscape type.
Landscape Feature	Physical elements of the landscape or development site.
Landscape Impact	A prominent eye-catching element or landmark (e.g. church spire, wooded hilltop)
Landscape Effect	The change in the elements, characteristics, qualities and overall character of the landscape as a result of development.
Landscape Evaluation	The consequence of change in the elements, characteristics, qualities and overall character of the landscape as a result of development. These effects can be positive, neutral or negative.
Landscape Quality (or Condition)	The process of attaching value (non-monetary) to a particular landscape, usually by the application of previously agreed criteria, including consultation and third party documents, for a particular purpose (for example, designation or in the context of an assessment).

Term	Definition
Landscape Resource	Based on judgments about the physical state of the landscape and about its intactness. Also relates to the state of repair of individual features and elements which make up character in any one place.
Landscape Sensitivity	The combination of elements that contribute to landscape context, character and value.
Magnitude of landscape change	The extent to which a landscape can accept change of a particular type and scale and is assessed in relation to the following: • Existing land use; • Pattern and scale of the landscape, including simplicity/complexity; • Landscape quality or condition including presence of any detracting features; • The nature of views – visual enclosure/openness of views, scale of views; • Value placed on the landscape – which may be expressed through designation; and • Scope of mitigation, which will be in character with the existing landscape.
Magnitude of visual change	A measure of the amount of change to the landscape that would occur as a result of proposed development, generally based on the scale or degree of change to the landscape resource, the nature of the effect and its duration. This is based on a combination of largely quantifiable parameters defined in the LVIA Appendix A8-1.
Methodology	A measure of the amount of change to the visual context that would occur as a result of a proposed development. This is generally based on the scale of change to the view with respect to the loss or addition of features in the view and changes in its composition, including the proportion of the view that would be occupied by the proposed development; the degree of contrast or integration of any new features of changes in the landscape with the existing or remaining landscape elements and characteristics in terms of form, scale, mass, line, height, colour and texture; duration and nature of the change, whether temporary or permanent, transient or persistent, etc.; the angle of view in relation to the main activity of the receptor(s); distance of the viewpoint from the proposed development; and extent of the area over which the changes would be visible.
Mitigation Measures	The specific approach and techniques used for a given study.
Paul's Hill Array	Measures including any process, activity or design process to avoid, reduce, remedy or compensate for adverse landscape and visual impacts of a development. Mitigation can also apply to the amelioration of existing adverse effects associated with existing developments/features in the landscape.
Perception (of Landscape)	Refers to both the original Paul's Hill I and proposed Paul's Hill II Wind Farm developments.
Perceptual elements	Perception (of Landscape): The psychology of seeing and possibly attaching value or meaning to the landscape. Elements of the landscape which evoke a response to the senses, such as; • Wildness; • Remoteness; • Sense of security; and • Tranquillity.
Persistent View	A view which is obtained over a continuous period of time.
Receptor	Physical landscape resource, special interest or individual or group experiencing view liable to change as a result of the proposed development.
Residual Effects	Effect of development after mitigation proposals are taken into account.
Scoping	The process of identifying likely significant effects of a development on the environment which may be carried out in a formal or informal way.
Significant Effect	An effect which is considered by the assessor to be "significant" in terms of the Environmental Impact Assessment Regulations which require the identification of significant effects. Examples of Significant effects are considered in LVIA Appendix A8-1 ad A8-2.
Transient View	A view which obtained momentarily, as part of a sequence of views, e.g. from a car travelling along a road.
Visual Amenity	Particular composition of landscape elements that contribute to a view, or views.
Visibility Analysis	The process of identifying theoretical (based on digital modelling) and/or actual predicted areas from where any given development may be seen.
Visual Effect	The consequence of change in the appearance of the landscape as a result of development, which may be positive or negative.
Visual Impact	The change in the appearance of the landscape and nature of views which may be adverse or beneficial
Visual Envelope	The extent of potential visibility to or from a specific area or feature.
Viewpoint Sensitivity	

Term	Definition
Visualisation	The extent to which a view would be altered by change of a particular type and scale, assessed in relation to the following: • Location and land use (receptor activity) at the viewpoint or context of the view; • Landscape character and quality at the viewpoint; • Landscape character and quality of the intervening landscape; • Importance of the view (which may be determined with respect to its popularity or number of affected people, • its appearance in guidebooks, on tourist maps and the facilities provided for its enjoyment and references to it in literature and/or art.
Zone of Theoretical Visibility (ZTV)	Computer generated simulation or photomontage or other technique to illustrate how the proposed development would appear.
Zone of Visual Influence or Viewshed	The area predicted to have views of a proposed development on the basis of a digital terrain model or digital surface model, which may/may not take account of land cover features.
	The area within which a proposed development will be visible.

List of Abbreviations

List and describe your abbreviations here.

Abbreviation	Description
LIA	Landscape Impact Assessment
VIA	Visual Impact Assessment
LVIA	Landscape and Visual Impact Assessment
CLVIA	Cumulative Landscape and Visual Impact Assessment
LCA	Landscape Character Area
LCT	Landscape Character Type
CNP	Cairngorms National Park
CNPA	Cairngorms National Park Authority
AGLV	Area of Great Landscape Value
SLA	Special Landscape Area
WLA	Wild Land Area
NSA	National Scenic Area

6.1 INTRODUCTION

6.1.1 This Landscape and Visual Impact Assessment (LVIA) provides a comprehensive and focussed assessment of the likely significant effects of the proposed Paul's Hill II Wind Farm on the landscape resource and visual amenity within an identified study area. These assessments have been carried out and presented by a Chartered Landscape Architect in accordance with the *Guidelines for Landscape and Visual Impact Assessment*, *Third Edition*, (Landscape Institute and the Institute of Environmental Assessment, 2013) (GLVIA3).

6.1.2 Paul's Hill II turbines are proposed at a height not exceeding 149.9 m to blade tip. In accordance with the guidance provided in *'Visual Representation of Wind Farms Good Practice Guidance Version 2.2'*, (SNH, 2017), for the production of ZTV figures, the Study Area will extend 40 km from a circle enclosing the final turbine arrangement. A study area of 40 km from the outer edge of Paul's Hill II turbines was proposed in the LVIA section of the scoping report, dated March 2017 and agreed to in consultee responses.

6.1.3 This chapter is supported by the following Technical Appendices, Visualisations and Figures:

Appendices

Table 6.1: List of Appendices

Appendix Number	Appendix Name
A6.1	LVIA Methodology
A6.2	CLVIA Methodology
A6.3	Landscape Impact Assessment Appendix
A6.4	Visual Impact Assessment Appendix

Figures

Table 6.2: List of Figures

Figure Number	Figure Name
6.1	Banded ZTV to tip height - A0 1:50k base
6.2	Banded ZTV to tip height A3 :250k base
6.3	Banded ZTV to hub height A3 :250k base
6.4	Landscape Character
6.5	Landscape Designations
6.6	Residential Receptors
6.7a	Residential Wireline RRVP01 Glenarder
6.7b	Residential Wireline RRVP02 Corglass Farm building group
6.7c	Residential Wireline RRVP03 Leakin Farm Building Group
6.8	Settlement Receptors
6.8a	Settlement Wireline SVP01 Archiestown
6.8b	Settlement Wireline SVP02 Upper Knockando
6.8c	Settlement Wireline SVP03 Craigellachie
6.8d	Settlement Wireline SVP04 Dallas
6.9	Sequential Receptor Location Map
6.10 a-f	Sequential Routes ZTVs
6.11	Cumulative Search Area

Figure Number	Figure Name
6.12	Cumulative Baseline
6.13a	Cumulative ZTV – Paul's Hill I, Berryburn and Paul's Hill II
6.13b	Cumulative ZTV - Rothes I, Rothes II and Paul's Hill II
6.13c	Cumulative ZTV - Hill of Towie I, Hill of Towie II and Paul's Hill II
6.13d	Cumulative ZTV - Dorenell, Clashindarroch and Paul's Hill II
6.13e	Cumulative ZTV - Dorenell Variation and Extension and Paul's Hill II
6.13f	Cumulative ZTV - Meikle Hill, Kellas and Paul's Hill II
6.13g	Cumulative ZTV - Hill of Glaschyle, Cairn Duhie and Paul's Hill II
6.13h	Cumulative ZTV - Scenario 1 Paul's Hill II & operational/construction sites
6.13j	Cumulative ZTV - Scenario 2 Paul's Hill II & operational/construction/consented sites
6.13k	Cumulative ZTV - Scenario 3 Paul's Hill II & operational/construction/consented/submitted sites
6.14a	Visualisation 1 Tormore Distillery
6.14b	Visualisation 2 Ben Aigan
6.14c	Visualisation 3 Ben Rinnes
6.14d	Visualisation 4 Minor Road, Knockando to Dallas, near Aultnahuish
6.14e	Visualisation 5 Carn a Ghile Chearr
6.14f	Visualisation 6 Archiestown
6.14g	Visualisation 7 Upper Knockando
6.14h	Visualisation 8 Carn Diamh
6.14j	Visualisation 9 A95 between Aberlour and Ballindalloch
6.14k	Visualisation 10 A95 Memorial at Junction with B9008
6.15a	Sequential Route Viewpoint SEQ01 A95, Cromdale
6.15b	Sequential Route Viewpoint SEQ02 B970, Tomachrochar
6.15c	Sequential Route Viewpoint SEQ03 B970, North of Nethy Bridge
6.15d	Sequential Route Viewpoint SEQ04 Speyside Way, West of Carron

6.2 METHODOLOGY

6.2.1 A detailed description of the LVIA and Cumulative LVIA (CLVIA) process and methodology is included in Appendices A6.1 and A6.2.

6.2.2 This LVIA represents the second stage in the process of assessing likely significant landscape and visual effects as a result of the proposed Paul's Hill II Wind Farm development.

6.2.3 The first stage assessment was carried out as part of the preparation of the LVIA section of the scoping report in order to establish the landscape, visual and cumulative baselines for the LIA and VIA. Potential Landscape and Visual receptors within the 40 km study area were identified using planning documentation listed below, detailed analysis of the Zone of Theoretical Visibility (ZTV) Figures 6.1- 6.3, and site verification. These receptors were then assessed. These first stage assessments are included in the Appendices A6.3 and A6.4 for ease of reference.

6.2.4 The findings of these initial assessments determined the most relevant receptors with the potential to experience significant effects and comprise the landscape and visual baselines for this LIA and VIA, which are detailed in sections 6.8 and 6.9.

6.2.5 In addition, initial first stage assessments identified other relevant wind farm developments likely to pose significant cumulative effects when experienced together with the proposed Paul's Hill II Wind Farm development. These other wind farm developments are detailed in section 6.7.

6.2.6 In addition to the GLVIA3, the initial and detailed assessment takes account of the following documents:

- Topic Paper 6: Techniques and Criteria for Judging Capacity and Sensitivity (Scottish Natural Heritage and the Countryside Agency 2004);
- Siting and Designing Wind Farms in the Landscape, Version 3a, (SNH, 2017)
- Visual Representation of Wind Farms, Version 2.2, (SNH Feb 2017)
- Use of Photography and Photomontage in Landscape and Visual Assessment (Landscape Institute Advice Note 01/2011);
- Assessing the Cumulative Impact of Onshore Developments (SNH, March 2012)
- Moray Onshore Wind Energy, Supplementary Policy Guidance, Moray Council March 2013 and Moray Onshore Wind Energy Supplementary Guidance Revised Draft 2016.
- Moray Wind Energy Landscape Capacity Study (MWELCS) – Updated and Revised Final Main Report – Post Consultation, Carol Anderson Landscape Associates, May 2017;
- Moray and Nairn Landscape Character Assessment, SNH 1998;
- Moray Local Development Plan (Moray LDP) (2015)
- Scottish Natural Heritage and Cairngorms National Park Authority (2010). The special landscape qualities of the Cairngorms National Park. Scottish Natural Heritage Commissioned Report, No.375 (iBids and Project no. 648).
- Cairngorms National Park Partnership Plan 2017-2022 (2017)
- Moray Core Paths Plan (Adopted 2011)
- Highland Core Paths
- Cairngorms Core Paths Plan (2015)
- Wild Land Area descriptions
- Scottish Natural Heritage consultation on draft guidance: Assessing impacts on Wild Land Areas – technical guidance (SNH, 2017)

6.2.7 The assessment also takes cognisance of relevant national landscape planning policy detailed in earlier sections.

ZTV and Visualisation production

6.2.8 To aid the understanding of the visual impact of the proposed development Zone of Theoretical Visibility (ZTV) analysis, wirelines and photomontages are generated, these are all completed to the standards requested by SNH in their guidelines on "Visual Representation of Wind Farms" Version 2.2. Freely available elevation data from Ordnance Survey (OS) at a resolution of 50 m was used within GIS software to complete Viewshed analysis. The tip height of the proposed turbines was used with an observer height of 2 m to determine the number of turbines visible within 40 km of the proposed development at the observer height. The tool outputs were coloured in bands to represent the number of turbines visible. This tool was run again using the turbine hub heights to determine the number of hubs visible within 40 km. Cumulative sites were assessed in the same manner to allow for an assessment of the complete visibility of all wind farm sites within the area.

6.2.9 To accompany the ZTV analysis wind farm modelling software was used to generate wirelines and photomontages at a number of significant viewpoints close to the proposed development. Again the OS 50 m resolution elevation data was used, to generate the terrain model around the development within the software. The proposed turbine locations and dimensions are then used to draw a wire representation of the turbines. Using this information the software will then generate a horizontal view wireline of the proposed development from selected viewpoints. These are then exported as images at a number of viewcone angles, typically at 90 ^{O} and 53.5 ^{O} for the best representation of what a person will see. Additionally photomontages can be generated for the same viewpoint locations. To complete this analysis photos are taken at the viewpoint locations at a complete 360^{O} view, these photos can then be imported and lined up to match the viewcone defined for the wireline. Once the photos are aligned with the view the turbines can be rendered onto the photo and again these can be exported as images.

6.3 CONSULTATIONS

6.3.1 An initial Scoping request was submitted to the Energy Consents and Deployment Unit (ECDU), in March 2017. This contained detailed and focused questions pertaining to the overall methodology of the LIA and VIA and the landscape, visual and cumulative receptors to be assessed in detail. Responses to these LVIA questions from the key landscape consultees are summarised below in Table 6.3, along with details of how these have been addressed.

Table 6.3: Summary of Consultation responses and LVIA response

Scoping Question/ Consultation issue	SNH Response 15.10.14 SNH Response 5.7.17 SNH Response 9.8.17	CNPA Response 3.7.17 Landscape Architect (LA) Response 26.6.17 Email Responses 7.9.17 & 31.8.17	LVIA Response
Qu. 6: Do the consultees have any comments about the proposed LVIA and CLVIA methodologies?	*SNH 5.7.17:* We are broadly content with the approach to the assessment of landscape, visual and cumulative impacts as outlined in the scoping report. We agree that the threshold of significance of effects is set where there is an assessment of moderate or major impact. Please note our responses to questions 14 and 16 in particular.	*CNPA 3.7.17:* No comment	Detailed description of whether moderate effects are considered significant or not is included in LVIA.
Qu. 7: With reference to Figures 13.7A-13.7K, do the consultees have any comments about the design of the proposed development?	*SNH 5.7.17:* We are of the opinion that this site has scope to accommodate an extension and the layout currently reads as an extension. The height differential between the existing turbines and the proposed is where the iterative approach will help to maximise the design.	*CNPA 3.7.17:* No particular comments at this stage – further comment will be informed by submission of information to enable full assessment of impacts on the National Park to be made. *LA Response 26.6.17:* The difference in height between existing (100m) and proposed turbines (149.9m) is potential cause for concern as it could lead to a significantly higher visibility and visual impact from the proposed development than from the existing wind farm.	These concerns are addressed in detailed assessment and in visualisations provided.
Qu. 8: Do the consultees have any comments about the landscape baseline selected above that will be included in the detailed assessment and those landscape receptors proposed to be 'scoped out' of the detailed LVIA?	*SNH 5.7.17:* We are happy with the approach detailed.	*CNPA 3.7.17:* No comment *LA Response 26.6.17:* The baseline for landscape character should be taken from SNH's national coverage of Landscape Character Assessments and the Cairngorms National Park LCA (2009) The proposed development starts approximately 7km outside the Park, and will have an impact on the northern edge of the Park. This closest point is located on the A95, near Advie.	The CNPA LCAs identified in 2009 study have been assessed in initial assessment with one LCA Hills of Cromdale 83 taken forward to detailed assessment in section 6.8
Qu. 9: With reference to Figures 13.7A-7K, do the consultees have any comments on the Viewpoint Selection listed in Table 13.3?	*SNH 5.7.17:* We support the CNPA's request for an additional location at Mains of Garten and do not request any additional viewpoints. *Previous October 2014 comments:* To allow some consistency, it would be useful to indicate which viewpoints were previously used for the assessment of Paul's Hill and/or Berry Burn Wind Farms and which are additional.	*CNPA 3.7.17:* We request that a viewpoint is added on the B970 at Mains of Garten (296541, 819941) for assessing the effects on the landscape character resulting from the proposal which is substantially different in height, size and appearance to the existing Paul's Hill I Wind Farm and also for assessing visual and cumulative effects. *LA Response 26.6.17:* To assist with the assessments, we would request wirelines to be run for a location on the B970 at Mains of Garten (296541, 819941) with an option for full visualisations if they would demonstrably assist in the assessment and design process. *Email Responses 7.9.17 & 31.8.17:* Consequently, whilst we	Subsequent email correspondence dated 28.8.17 and 1.9.17 sent to CNPA and copied to SNH detailed our attempts to provide an additional VP from suggested receptor with draft visualisations provided which illustrated no suitable VP available. Agreed to not include formal VP but illustrative wireline and informal (non-SNH compliant)

Scoping Question/ Consultation issue	SNH Response 15.10.14 SNH Response 5.7.17 SNH Response 9.8.17	CNPA Response 3.7.17 Landscape Architect (LA) Response 26.6.17 Email Responses 7.9.17 & 31.8.17	LVIA Response
		would not necessarily require an LVIA viewpoint from the B970, we do consider that wireline B (and possibly other additional wirelines) should be used to inform an assessment of effects on the special landscape qualities in this part of the Park and should be included within the ES. I can confirm that the approach you suggest is acceptable to deliver the information we need.	roadside photography to demonstrate roadside screening for sequential assessment of B970 route.
Qu.10: With reference to Figures 13.9A-9L (illustrative wirelines), do the consultees have any comments about the viewpoint locations proposed to be 'scoped out' of the assessment?	*SNH 5.7.17:* We are content that those intended to be assessed in table 13.3 give representative coverage.	*CNPA 3.7.17:* We would agree this approach is appropriate on the basis that the material that is contained in the scoping report will remain publicly available should we wish to refer to it in the future in respect of the wirelines for those viewpoints contained in Figure 13.9 within the National Park (Viewpoints A Ptarmigan, E military road at Lynmore, F Meall a Bhuchaillie and G Ladder Hills)	These illustrative wirelines are still available for reference as part of scoping report.
Qu. 11: Do the consultees have any comments on the list of settlements to be included in the detailed LVIA assessment?	*SNH 5.7.17:* No comments.	*CNPA 3.7.17:* No comments	
Qu. 12: Do consultees have any comments on the proposed RVAA study area of 3km and the general methodology outlined above?	*SNH 5.7.17:* No comments.	*CNPA 3.7.17:* No comments	
Qu. 13: Can the consultees confirm	*SNH 5.7.17:* It is acceptable to us.	*CNPA 3.7.17:* The ZTV shows potential visibility of turbines from	The B970 has been added to the

Scoping Question/ Consultation issue	SNH Response 15.10.14 SNH Response 5.7.17 SNH Response 9.8.17	CNPA Response 3.7.17 Landscape Architect (LA) Response 26.6.17 Email Responses 7.9.17 & 31.8.17	LVIA Response
the list of sequential receptors to be included in the detailed LVIA assessment is acceptable?		the A95 near Cromdale. It also shows potential visibility from the relatively low lying B970, near Mains of Garten between Boat of Garten and Nethy Bridge. This stretch of road is part of the open Strathspey and allows long vistas towards the surrounding higher landscapes…The LVIA should cover an assessment of sequential visual impacts, including wirelines, from this section of the road.	sequential receptors for detailed assessment in section 6.9
Qu.14: Do consultees have any comments on the cumulative baseline listed in Table 13.7?	*SNH 5.7.17:* Appears to be in agreement with developer's approach in accordance with SNH guidance. 'The justification for the 20 km focused study area is compelling and in previous advice (SNH scoping response letter to ECU dated 15/10/14) we suggested a more focused study area to help inform design iteration.'	*CNPA 3.7.17:* Of particular interest to the CNPA will be the relationship in terms of layout scale and height to the existing wind farms which form part of a cluster on the north of the National Park. All material will need to clearly show the impacts of the proposed development in relation to the existing ones. All cumulative assessment should be carried out with reference to SNH guidance. The cumulative impact in relation to the National Park will require to be fully assessed as there may be potentially significant cumulative effects on the visual experience of the Park.	All visualisations clearly label all cumulative developments at different stages including operational developments. The cumulative effects on CNPA are fully assessed in section 6.8.
Qu. 15: Do consultees have any comments in relation to a proposed reasonable end date for further changes to the baseline being two months prior to the submission of the LVIA and CLVIA?	*SNH 5.7.17:* This is reasonable and given the circumstances of the Clash Gour proposal being brought forward at a similar pace we would be prepared to re-comment on timescales for cut off should 2 months become overly restrictive.	*CNPA 3.7.17:* This is considered to be reasonable	2 month cut off prior to LVIA submission is agreed and has been implemented.

Scoping Question/ Consultation issue	SNH Response 15.10.14 SNH Response 5.7.17 SNH Response 9.8.17	CNPA Response 3.7.17 Landscape Architect (LA) Response 26.6.17 Email Responses 7.9.17 & 31.8.17	LVIA Response
Qu. 16: Do consultees have any comments about the 4th cumulative baseline scenario not being necessary?	*SNH 5.7.17:* We strongly recommend that Clash Gour and Ourack Wind farm proposals (both at scoping) should be included in the baseline. We appreciate that at the time of writing this scoping report Clash Gour was at pre-scoping and even following its scoping consultation there remains relatively limited information publically available. The decision as to which proposals in the planning/consenting system should be included in an assessment remains the responsibility of the determining authority. *SNH Response 9.8.17:* All 3 schemes have been scoped but only Paul's Hill II provided details of turbine location and height. We accept there is not the same level of detail for the other schemes. We concur that a CLVIA based on the unknown parameters for these schemes would be highly speculative. The solution Mr Potter offers is to monitor the cumulative situation and include any additional application stage developments up until the agreed 2 month cut-off. Although this option would	*CNPA 3.7.17:* The following proposals, both at formal scoping stage, should be also included in the cumulative baseline • Clash Gour which currently proposes up to 63 wind turbines of height to tip varying from a range of 135 to 175 metres wrapping around the existing Berryburn Wind Farm. • Ourack We therefore consider that there is a need for the fourth scenario taking proposals at scoping stage into account.	Follow up consultation dated 2.8.17 presented the case for not including this 4th speculative scenario to the cumulative baseline. SNH appear in agreement with this approach and the cumulative baseline has been monitored closely up until the submission date and agreed 2 month cut-off date (see Question 15)

Scoping Question/ Consultation issue	SNH Response 15.10.14 SNH Response 5.7.17 SNH Response 9.8.17	CNPA Response 3.7.17 Landscape Architect (LA) Response 26.6.17 Email Responses 7.9.17 & 31.8.17	LVIA Response
	be contrary to our previous recommendation, on reflection, we do not disagree with the sentiment that it would be very difficult, and potentially costly, to carry out a meaningful cumulative assessment including both Ourack and Clash Gour at this time.		
Special Qualities of the CNP		*CNPA 3.7.17:* Should viewpoints show visibility of any of the turbines in the low lying Strath, this will be of great concern due to the potential impact it will have on the experience of Special Landscape Qualities there. The potential for significant impact on the Wild Land Areas of the Monadhliath or Cairngorms through the proposed development is small. However, the Special Landscape Quality of Wildness is important to many areas of the Park.	Special landscape qualities including wildness are assessed in depth in section 6.8
Overall Assessment in scoping response		*LA Response 26.6.17:* From the information provided it is my view that the Paul's Hill II Wind Farm consisting of 7 turbines, no higher than 149,9m, would have the following possibly significant effects on the CNP; • Landscape and visual effects from the northern parts of the Park arising from the increased number of turbines visible. The differences in height and layout could make the proposed development more visible and visible in additional areas within the Park.	The listed topics are included in detailed assessment in section 6.8 of this LVIA. Concluding remarks of this LVIA include policy tests analysis.

Scoping Question/ Consultation issue	SNH Response 15.10.14 SNH Response 5.7.17 SNH Response 9.8.17	CNPA Response 3.7.17 Landscape Architect (LA) Response 26.6.17 Email Responses 7.9.17 & 31.8.17	LVIA Response
		• Cumulative effects as experienced from the Park. • Effects on the Special Landscape Qualities experienced within the Park. The ES should contain sufficient information and analysis in respect of these topics for the policy tests to be undertaken (NPPP policies 1.3 and 2.3 and SPP para 212).	

6.3.2 This iterative consultation process has informed the landscape, visual and cumulative baseline receptors 'scoped in' to the detailed assessment. The potential effects on these receptors are assessed in detail in the LIA and VIA in sections 6.8 and 6.9.

6.3.3 Those landscape, visual and cumulative receptors identified in the initial assessments and 'scoped out' of the detailed assessment are included in Appendices A6.3 and A6.4

6.4 PROJECT DESCRIPTION

6.4.1 The proposed development comprises 7 wind turbines, 6 to a blade tip of 149.9 m and 1 turbine to a blade tip of 134 m. Ancillary development will include the utilisation where possible of existing access tracks with additional lengths of track required to the proposed turbine locations.

6.4.2 The proposed Paul's Hill II Wind Farm would comprise the following phases:

- Construction Phase
- Operational Phase;
- Decommissioning Phase

6.4.3 Based on the detailed description of the proposed development in Chapter 4: Project Description, the likely sources of landscape and visual effects that will occur during each phase are as follows:

Table 6.4: Potential sources of landscape and visual effects during each development phase

Construction	Operational	Decommissioning
Vehicular/personnel movements, including lighting on the site	Tall vertical structures with moving parts (turbines and monitoring masts)	Dismantling and removal of wind turbines and anemometer masts, trimming of foundations to a depth of 1 m below ground surface levels, and restoration of turbine locations to match the character and appearance of the adjoining forested moorland landscape
The disturbance of areas of land and surface vegetation	Access tracks and hardstanding areas at each turbine location at ground level	Access tracks will either be left for use by the landowner or covered in topsoil
The upgrading of existing site access tracks and formation of new tracks, crane hardstandings at each turbine location and the substation	Additional Onsite substation	Deplanting of grid infrastructure, removal of the grid connection compound, and reinstatement of the compound location to match the character and condition of the adjoining forested moorland where required.
The construction and use of a works compound	Remains of borrow pits	Implementation of site restoration following an agreed Decommissioning Method Statement.
The gradual introduction of tall vertical structures (turbines and a monitoring mast) and the use of cranes	Occasional maintenance activity and vehicular/personnel movements around the site and on local roads	Removal of other above ground construction
Excavation of borrow pits;		
Reinstatement of temporary compounds, borrow pits and track sides following construction		
The turbines themselves would be erected over a short period, typically 1-2 days per turbine, and the appearance of the construction cranes in views of the site would therefore be of short duration.		
Installation of new Substation control building		

6.4.4 Post decommissioning of the proposed Development, including the removal of all above ground structures and reinstatement works, the remaining effects would largely relate to the retained site entrance and site tracks, and the restored borrow pits. The site will be returned to open moorland.

6.4.5 Potential effects of the Construction and Decommissioning phases would include temporary effects on the landscape fabric of the proposed development area and temporary effects on the landscape character and visual amenity of the immediate area. The potential effects of the Construction and Decommissioning Phases have therefore been assessed for the Proposed Development Area and the Landscape Character Type containing the proposed development; LCT11 Open Rolling Uplands.

6.4.6 The full LIA and VIA consider the residual effects of the operational phase resulting from the introduction of the proposed Paul's Hill II Wind Farm following the mitigation measures which have been embedded into the design of the proposed layout.

6.5 EMBEDDED MITIGATION

6.5.1 It is accepted that wind farms, by their nature and scale, generally result in some significant landscape and visual effects. The iterative design approach aimed to mitigate such significant effects through careful siting and design of developments. Whilst the element with greatest potential for significant effects will generally be the wind turbines, the associated infrastructure such as tracks, power-lines, substations and control buildings must also be carefully considered. SNH's current guidance 'Siting and Designing Wind Farms in the Landscape (version 3a August 2017 para 1.15) states that:

6.5.2 *'Wind farms should be sited and designed so that adverse effects on landscape and visual amenity are minimised and so that landscapes which are highly valued are given due protection. If wind farms are sited and designed well the capacity of our landscape to incorporate this type of development is maximised.'*

6.5.3 Paragraph 3.22 of SNH's guidance goes on to state that:

6.5.4 *'It is important to site and design a wind farm so that it relates directly to the qualities of a specific site. The main design elements are likely to include the following:*

- *Layout and number of wind turbines;*
- *Size, design, and proportion of wind turbines;*
- *Type, route and design of new and existing upgraded access tracks, including the amount of cut and fill required and the junctions with public roads;*
- *Location, design and restoration of hardstandings;*
- *Location, design and restoration of borrow pits;*
- *Location, design and restoration of temporary construction compounds;*
- *Location and size of wind monitoring masts;*
- *Positioning and mitigation of turbine lighting (if required);*
- *Visitor facilities, including paths, signs, parking and visitor centre (if proposed); and*
- *Land management changes, such as muirburn, woodland management or felling, fences, and stock grazing.'*

6.5.5 Based on SNH's guidance together with an analysis of the baseline context of the proposed development area and advice received from consultees, the embedded mitigation would include considerations of the following issues in relation to the landscape, visual and cumulative context:

Site location and layout

6.5.6 The siting and layout of the proposed development was based on an iterative design process aimed at reducing environmental effects whilst achieving suitable technical and commercial objectives bearing in mind the recent and emerging changes to funding mechanisms and the requirement for wind energy to compete in a levelised cost of electricity market (as discussed further in Chapter 2: Planning and Policy Context). The design development is described in Chapter 3. To summarise, the following key landscape and visual objectives were followed for the design of the proposed development:

- Location of the proposed development to the east of Cairn Kitty and to the north of Roy's Hill to use the enclosure provided by these hills to visually contain the proposed development;
- Location of the proposed development to the south of the complex and smaller scale landscape to the north east of Cairn Kitty which would be highly sensitive to wind farm development.
- The selective use of smaller turbine at the highest point on site and closest to the summit of Roy's Hill to minimise the adverse landscape effects on this landmark hill.
- The setting back of the turbines from the highly visible landform 'edge' as viewed from the adjacent LCT7 Spey Valley to restrict visibility from these more sensitive low lying positions, including sensitive receptors within this valley such as walkers of the Speyside Way and travellers along the A95 main road route;
- Avoidance of significant effects on areas designated for their landscape value (e.g. CNP, Moray AGLV Spey Valley and Drynachan and Lochindorb SLA);
- Focusing of the proposed development in an area already subject to extensive wind farm development to concentrate development rather than dispersing it throughout the locality, and within a search area where there is an expectation of large typology wind turbines, as defined in the MWELCS 2017.
- Use of a layout that reflects the development pattern of nearby existing wind farms;
- To achieve where possible a proposed development with tip heights in keeping with adjacent operational developments.
- The use of large turbines to maximise energy outputs whilst minimising land take and effects on landscape fabric. Wherever possible, ensuring that the proposed development would be seen in the same part of the view as other wind farm developments, and overlapping with them.

Turbine design

6.5.7 The proposed development would make use of three bladed horizontal axis turbines with tubular steel towers. Research (Stevenson and Griffiths, 1995) has confirmed that tubular turbine towers reduce visual clutter and are simpler in appearance. Consequently, the use of such turbines for the proposed development would be consistent with the simplicity of the surrounding landscape. Care was also taken to achieve a balanced ratio between tower height and blade length.

6.5.8 With regard to the colour of the proposed turbines, Siting and Designing Wind Farms in the Landscape (Version 3a) SNH, 2017 states that:

'Selecting the most appropriate colour for a turbine(s) is an important part of detailed windfarm design and mitigation. It has previously been assumed that wind turbines could be painted a colour that would camouflage them against their background. Experience has shown that it is not possible to 'hide' turbines' (para 2.7)

6.5.9 Para 2.9 of this guidance goes on to state that:

'As a rule for most rural areas of Scotland:

- A single colour of turbine is generally preferable;
- a light grey colour generally achieves the best balance between reducing visibility and visual impacts when seen against the sky, although this works less well when viewed against the land;
- light coloured turbines seen against a land backdrop may have greater prominence than light or dark turbines seen against the sky;
- paint reflection should be minimised. Texture is an important factor in reducing reflectivity, and matt or light absorbent finishes are preferable;
- For multiple wind farm groups or wind farm extensions, cumulative colour effects will be a key consideration. A strategic approach to turbine colour is desirable and the colour of turbines should generally be consistent.'

6.5.10 In cognisance of the guidance a simple pale grey colour and non-reflective render is therefore proposed for the Paul's Hill II Wind Farm turbines.

Access Tracks

6.5.11 The existing Paul's Hill access tracks will be utilised to minimise the amount of ground disturbance and loss of characteristic vegetative cover. Notwithstanding this, 3.739 km of new tracks would be required, including sections

linking to proposed turbine locations. New tracks would be constructed to match the appearance of existing forestry tracks and have been designed to avoid prominent slopes and summits.

6.5.12 During the construction phase of the proposed development all access tracks would be constructed/widened to a nominal width of 5 m to accommodate construction vehicles and abnormal load deliveries.

6.5.13 The proposed internal tracks are located to the north of Roy's Hill and are aligned so as to take advantage of the screening effect of intervening topography and/or vegetation. Consequently, the tracks are likely to be screened from the majority of external viewpoints.

Crane Pads

6.5.14 These would be surfaced to match the proposed track construction. Whilst crane pads would be retained for the duration of the proposed development they are likely to be screened from the majority of external viewpoints by topography.

Cabling, Substation Control Building and Substation

6.5.15 In order to avoid potential visibility of the grid connection cables these would be undergrounded within the site from each turbine to the substation and onsite grid connection. Undergrounded sections of cable would, wherever practicable, be placed beside proposed access tracks to reduce disturbance of the landscape and to ease future maintenance.

6.5.16 A new Substation control building will be constructed adjacent to the existing control building at Paul's Hill Wind Farm see ES Figure 4.10 in Volume 3 of this ES) and will be used for the management of the proposed development. An indicative layout for the control building can be seen in Figure 4.10, which is similar in layout to the existing control building. Consequently, this aspect of the proposed development will appears in keeping with existing onsite infrastructure and is screened to some degree from the majority of external receptors by the rolling site landform and intervening topography.

Construction Compound

6.5.17 During the construction phase of the proposed development, a temporary compound and laydown site will be required. Upon completion of construction works the compound would be removed and the ground reinstated. In order to ensure that the compound and laydown area can be returned to a condition consistent with the adjacent moorland, suitable construction methods and soil handling methods would be adopted. These would be specified in the Construction Method Statement (CMS) and agreed with Moray Council, SNH and SEPA prior to works commencing at the site.

Borrow Pits

6.5.18 The aggregate required for the new tracks and for upgrading of tracks would be won from two principal borrow pit areas located along the primary access road into the development area as shown in Figure 1.3. These excavations are located to avoid prominent slopes and summits and to the north of Roy's Hill summit which would screen most excavation activities from visually sensitive valley locations. Each borrow pit would be restored during the construction phase of the proposed development. Each restored borrow pit would be subject to suitable aftercare provisions.

Construction Methods and Landscape Reinstatement

6.5.19 Throughout all phases of the proposed development, ground disturbance on site would be confined, as far as practicable, to access tracks, turbine base areas, lay-down areas, crane pads and underground sections of the grid connection cables. The proposed location of these elements is described in Chapter 4: Description of Development and shown in Figure 1.2. Moreover, working widths would be restricted and carefully monitored and any existing landscape feature or materials arising from site operations that are to be retained would be safeguarded.

6.5.20 No significant stockpiles of aggregate would be retained on site during construction. Any aggregate arising from the proposed borrow pits would be placed directly.

6.5.21 All soils stripped from construction areas and borrow pits would be retained in clearly demarcated stockpiles of no greater than 3 m height in locations immediately around the edges of borrow pit excavations and/or directly placed to reinstate track sides.

6.5.22 On completion of the construction phase, all areas subject to ground disturbance adjacent to built elements would be reinstated to match adjoining undisturbed ground. Additionally, the surface of the former temporary compound would be scarified to prepare the surface for subsoil base and seeded to match surrounding vegetation.

6.5.23 A detailed construction and reinstatement method statement would be agreed with Moray Council and SEPA prior to commencement of construction activities.

Decommissioning

6.5.24 During decommissioning of the proposed development, all above ground structures would be removed and the ground reinstated. Subject to further assessment of site hydrology and soil cover depths, below ground structures and foundations would be left in place to avoid further disturbance.

6.6 LANDSCAPE PLANNING POLICY CONTEXT

6.6.1 Details of the National, Regional and Local planning policy of relevance to the proposed development is contained in Chapter 2: Policy Context. The following details those policies of particular relevance to landscape and visual issues.

Moray Local Development Plan 2015

6.6.2 The Development Plan relevant for the proposed development area is the Moray Local Development Plan (LDP) 2015.

6.6.3 Policy ER1 Renewable Energy Proposals states that:

'All renewable proposals will be considered favourably where they…avoid or address any unacceptable significant adverse impacts including Landscape and visual impacts.

For areas identified as Areas with Potential (for wind farm development) within the spatial framework ER1 requests *'detailed assessment of impact will include consideration of the extent to which:*

<u>Landscape and visual impact</u>

The proposal address the guidance set out in the Moray Wind Energy Landscape Capacity Study

The landscape is capable of accommodating the development without significant detrimental impact on landscape character or visual amenity

The proposal is appropriate to the scale and character of its setting, respects the main features of the site and the wider environment and addresses the potential for mitigation.

<u>Cumulative Impact</u>

Any detrimental impact from two or more wind energy developments and the potential for mitigation is addressed.'

6.6.4 *Policy E6: National Parks and National Scenic Areas* (NSAs) states:

'Development that affects National Parks or National Scenic Areas will only be permitted where the objectives of designation and the overall integrity of the area will not be compromised.'

6.6.5 *Policy E7 Areas of Great Landscape Value (AGLV) and impacts upon the wider landscape* states:

'Development proposals which would have a significant adverse effect upon an Area of Great Landscape Value will be refused unless:

- *a)They incorporate the highest standards of siting and design for rural areas*
- *b) They will not have a significant adverse effect on the landscape character of the area, in the case of wind energy proposals the assessment of landscape impact will be made with reference to the terms of the Moray Wind Energy Landscape Capacity Study*
- *c) They are in general accordance with the guidance in the Moray and Nairn Landscape Character Assessment.*

New developments should be designed to reflect the landscape characteristics and special qualities identified in the Landscape Character Assessment of the area in which they are proposed.

Proposals for new hill tracks should ensure that their alignment minimised visual impact; avoids sensitive natural heritage features; avoids adverse impacts upon the local hydrology; and takes account of the likely type of recreational use of the track and wider network.'

Moray Wind Energy Landscape Capacity Study (MWELCS) 2017

6.6.6 The LDP is accompanied by the supplementary guidance (SG) document providing onshore wind energy guidance in the form of the 'Moray Wind Energy Landscape Capacity Study' MWELCS, which was published in May 2017, and updates and replaces the Moray Wind Energy Landscape Capacity Study published in 2012.

6.6.7 This document identifies that the proposed development is located within the Landscape Character Type 11 Open Rolling Upland, which comprises an area of extensive moorland and low hills adjacent to the Spey Valley. MWELCS states that: 'some very limited scope has been identified for very large turbines around 150m high to be accommodated in this more extensive upland landscape'. (MWELCS p.77)

6.6.8 Siting guidance is provided in MWELCS and summarised in paragraph 6.7.18 of this LVIA. It forms the basis of design objectives and Chapter 3: Site Selection and Design Evolution demonstrates how this has influenced the design iteration of the proposed layout.

Cairngorms National Park Local Development Plan 2015

6.6.9 The CNP LDP 2015 is the Development Plan for the CNP which covers most of the southern part of the 40 km study area around the proposed development. A series of supplementary guidance, which is statutory and non-statutory guidance which does not form part of the CNP Local Development Plan, but can be a material consideration in the decision making process has been produced to be read in conjunction with the LDP Policies for the CGNPA area and provide more detail about how to interpret these policies.

6.6.10 *Policy 5: Landscape* states:

'There will be a presumption against any development that does not conserve and enhance the landscape character and special qualities of the Cairngorms National Park including wildness, and in particular, the setting of the proposed development.

Proposed development that does not complement and enhance the landscape character of the Park and the setting of the proposed development will be permitted only where:

a) any significant adverse effects on the landscape character of the Park are clearly outweighed by social or economic benefits of national importance; and

b) all the adverse effects on the setting of the proposed development have been minimised and mitigated through appropriate siting, layout, scale, design and construction to the satisfaction of the planning authority.

6.6.11 Policy 5 Landscape Non Statutory Planning Guidance has been taken into account in the preparation of this LVIA.

6.6.12 *Policy 7: Renewable Energy* states:

Proposals for renewable energy generation will be considered favourably where:

- *a) they contribute positively to the minimisation of climate change;*
- *b) they complement the sustainability credentials of the development;*
- *c) they conserve and enhance the special qualities of the Park;*
- *d) they include appropriate means of access and traffic management;*
- *e) they adequately minimise all cumulative effects.*

6.6.13 Policy 7 Renewable Energy Supplementary Guidance has been taken into account in the preparation of this LVIA.

6.6.14 Other guidance documents produced by the CNPA and SNH have informed this LVIA assessment and are referenced in the relevant sections throughout this document.

Cairngorms National Park Partnership Plan 2017-2022

6.6.15 This new CNP Partnership Plan came into effect in 2017 and sets out a series of Priorities to help the Park with the challenges it is likely to encounter over the next five years. These Priorities are categorised as follows:

- Priority 1: Supporting landscape scale collaboration
- Priority 2: Deer Management
- Priority 3: Moorland Management
- Priority 4: Visitor infrastructure and information
- Priority 5: Active Cairngorms
- Priority 6: Learning and inclusion
- Priority 7: Housing
- Priority 8 Community Capacity and empowerment
- Priority 9: economic Development

6.6.16 Objectives and guidance contained in this document has informed the LVIA assessment.

6.7 BASELINE CONDITIONS

6.7.1 The landscape baseline conditions represent the current landscapes of the proposed development area and the wider study area without any proposed development being constructed. Equally, the visual baseline represents the key viewers within the study area likely to experience the proposed development. Ascertaining the baseline conditions of the landscape and visual amenity of the study area involves the identification of relevant receptors which would be potentially affected by the proposed development. The initial first stage assessment carried out in the scoping report identified those receptors it was considered could potentially experience significant effects as a result of the proposed development and also 'scoped out' those receptors it was considered would not experience significant effects. The following section details those receptors with the potential to experience significant effects and outlines the methodologies adopted to determine these baselines.

Landscape Baseline

6.7.2 The assessment of landscape effects of the proposed development considers the effect on the landscape as a resource or a group of identifiable receptors. These include:

- Generalised *'landscape character types'* (LCTs) as identified by SNH's suite of Landscape Character Assessments together with subsequent regional specific reviews, often refining these to identify geographically specific Landscape Character Areas;
- Landscape fabric and Character of the proposed development area; and
- Designated landscapes, at international, national and local level.

6.7.3 These landscape receptors comprise the landscape baseline

Landscape Character

6.7.4 Landscape character is defined as a distinct, recognisable and consistent pattern of elements in the landscape that makes one landscape different from another, rather than better or worse. Landscape Character Types refer to distinct types of landscape that are relatively homogenous in character. They are generic in nature and can occur more than once in different parts of the country but wherever they occur they share broadly similar combinations of geology, topography, drainage patterns, vegetation, historic land use and settlement pattern. Landscape Character Areas are particular geographical examples of a landscape type and refine the broad classification of Landscape Character Types. (Swanwick, C. And LUC; Landscape Character Assessment – Guide for England and Scotland; Countryside Agency/SNH; 2002; p.8/9).

6.7.5 Overall, the landscape character of the study area consists of a central zone focused around the proposed development of upland landscapes, ranging from distinctive open uplands with a rolling topography to broader forested moorland tops. To the south of the proposed development are the distinctive Glens and Uplands landscapes of the Cairngorms National Park. To the north are the transitional landscapes of rolling farmland, some areas with key features of lower lying hills, or a greater concentration of forestry or distinctive valley depressions which creates a swathe of rolling farmland landscapes with different characteristics. Beyond this varied farmland lies a lower lying swathe of coastal plain backed by extensive blocks of coastal forestry, which fall away to the coastal marginal landscapes and the shoreline. A series of valley landscapes cuts through this general landscape pattern ranging between the narrow wooded gorge-like valleys such as he Findhorn to the broader farmed valley of the River Spey.

6.7.6 The following sources have been used to identify the LCTs of the study area and to assist with their baseline description:

- South and Central Aberdeenshire Landscape Character Assessment (SNH Nr.102, Environmental Resources Management, 1998);
- Moray and Nairn Landscape Assessment (SNH Nr.101, Turnbull Jeffrey Partnership, 1998);
- Inner Moray Firth Landscape Character Assessment (SNH Nr. 90, Sarah Fletcher, 1998);
- A subsequent review of the landscape character of the Moray area is contained in the Moray Wind Energy Landscape Capacity Study (A. Grant & C. Anderson, 2012 revised 2017) and covers the current Moray Council administrative area;
- Inverness District Landscape Character Assessment (SNH Nr. 114, John Richards, 1999);
- Cairngorms Landscape Assessment (SNH Nr. 75, Turnbull Jeffrey Partnership, 1996);
- A detailed level of landscape classification into Landscape Character Areas (rather than Types) within the National Park is contained in the Cairngorms National Park Landscape Character Assessment (Cairngorms National Park, 2009)

6.7.7 For the purposes of this LIA, the LCT baseline considers that the LCTs identified in the reviewed Moray Wind Energy Landscape Capacity Study (MWELCS) (2017) supersede those contained in the Moray Nairn Landscape Assessment (1998) for the Moray Council administrative area. This relates to Policy E7 (item b) of the Moray LDP (2015), requiring landscape assessment to refer to the Moray Wind Energy Landscape Capacity Study (2012/2016).

6.7.8 Outwith this boundary, the LCTs classified in the Moray Nairn Landscape Assessment (1998) remain valid categorisations and have been considered to take precedence over SNH Nr.90 the Inner Moray Firth LCA for LCA classifications around the Nairn area, owing to the intense focus of the Inner Moray Firth LCA on the inter-relationship with the Moray Firth waters.

6.7.9 It should be noted that the Landscape Character Areas (MN prefix) identified in the Moray Nairn Landscape Assessment written document (1998) refine the generic Landscape Character Types illustrated by SNH nationally available GIS datasets (MRN prefix) which mark the boundaries of LCTs throughout Scotland. Therefore the refined LCAs in the written 1998 document are assumed to take precedence for the area they cover. The generic LCT (MRN) datasets extend further west than the MN LCAs and in this location around the Nairn area and also for a narrow area of landscape near the Cairngorm NP boundary near Advie, the MRN LCTs are prioritised. For the purposes of the initial assessment detailed in Appendix A6.3, MRN4 LCT (uplands) consists of and is assessed under LCAs MN8, 9 and 10; LCT MRN3 (River Valleys) consists of and is assessed under LCAs MN6 and 7; MRN2 (Coastal Lowlands) consists of and is assessed under MN4 and 5 and MRN1 (Coastal) consists of and is assessed under MN1, 2 and 3. (Based on Figure 9 in Moray and Nairn Landscape Assessment,1998).

6.7.10 Equally, the Cairngorms National Park Landscape Character Assessment (CNP LCA) (2009) refines the Cairngorms Landscape Assessment (SNH, 1996), identifying individual geographic Landscape Character Areas within the generalised Landscape Character Types. This more detailed assessment has therefore been used as the landscape baseline for the CNPA area. For areas outwith the CNP LCA (2009) and the MWELCS (2017), LCTs classified in the Cairngorms Landscape Assessment (1996), namely 2 LCAs of the Uplands and Glens LCT (CNG2) and one LCA within the Straths LCT (CNG3) remain valid categorisations.

6.7.11 This complex landscape character baseline is illustrated in Figure 6.4.

6.7.12 The first stage initial assessment of potential effects on this landscape character baseline was carried out in section 13.6.1 of the scoping report in order to identify those landscape character types with the potential to experience significant effects and therefore requiring detailed assessment in the LIA. The findings of this initial assessment were agreed through the scoping consultation process and have been included in Appendix A6.3 for ease of reference.

6.7.13 Subsequent to scoping a small update has been carried out which includes the identification of the two separate LCAs to be fully assessed which lie within the CNG2 Uplands and Glens LCT and are identified in Figure 17 Landscape Character Areas within the Cairngorms Landscape Assessment (SNH, 1996). Also subsequent to this initial assessment, further assessment of the Cairngorms National Park Landscape Character Assessment (CNP LCA) (2009) has been carried out to determine those refined Landscape Character Areas with the potential to experience significant effects as a result of the introduction of the proposed development. The findings of this assessment are also contained in Appendix A6.3.

6.7.14 Eleven Landscape Character Types/Areas have been identified at initial assessment as landscape receptors with the potential to experience significant landscape effects and are taken through to be assessed in detail in the LIA. These are as follows:

- Open Rolling Upland (11) Landscape Character Type (LCT);
- Broad Farmed Valley (7) LCT;
- Upland Moorland and Forestry (10) LCT;
- Open Upland with Steep Slopes (12a) LCT;
- Coastal Farmland (4) LCT;
- Rolling Farmlands and Forest and valleys (5a) LCT;
- MN10: Open Uplands LCT;
- CNG2: Uplands and Glens LCT: Strathdearn Hills LCA (4)

- CNG2: Uplands and Glens LCT: The North-Eastern Hills LCA (6)
- CNG3: Cairngorm Straths LCT: Lower Spey (14)
- Hills of Cromdale (83) Landscape Character Area (LCA).

6.7.15 It should be noted, with reference to Figure 6.4 that the small area of MN7 between the MWELCS (2017) LCTs and the CNP (2009) LCAs is included in the detailed assessment of Broad Farmed Valley LCT (7). In addition, the small area of MRN3 in this same location is also included in the detailed assessment of Broad Farmed Valley LCT (7). The small area of MRN4 is included in the detailed assessment of Upland Moorland and Forestry LCT (10).

6.7.16 The key characteristics, general description and planning guidance contained in the relevant Landscape Character Assessment documents for each Landscape Character Type/Area are described as follows:

Open Rolling Upland LCT (11)

6.7.17 The Open Rolling Upland landscape (LCT11) is identified in the Moray Wind Energy Landscape Capacity Study (MWELCS, 2017) as the only upland LCT of this particular type within Moray but extends westwards into neighbouring Highland covering an extensive area of moorland and low hills, identified as MN10 Open Uplands LCT. The Open Rolling Upland LCT11 gradually merges with the broader plateau of the Upland Moorland and Forestry LCT10, but remains as a series of well-defined higher hills adjacent to it.

6.7.18 The proposed Paul's Hill II Wind Farm is located toward the south-eastern edge, within the Open Rolling Upland landscape (LCT11). This LCT has a multi-functional role within the study area landscapes, by forming a visual plateau edge or 'stop' to the Dava basin and Moidach More; Forming a gentle introduction to the majestic sweep of the glens and straths of the Cairngorms; By forming a long distance visual stop as a long ridgeline on the far horizon from the Moray coastal plain and forming a series of attractive rounded hills containing and shaping the broad farmed Spey Valley.

Key characteristics

- Extensive landscape;
- Simple undulating plateau with broad gentle slopes, shallow basins, flat mosses and rounded summits;
- Broad low-lying basin of Moidach More;
- Distinctive 'Landmark Hills' of Knock Of Braemory, Roy's Hill and Carn Kitty form key foci;
- Some localised smaller scale complex areas of smaller scale lochans north of Carn Kitty;
- Simple land cover of grass/heather moorland with some areas of moss and wetland around small lochans;
- Sparsely settled with isolated farms set within shallow valleys of the River Divie and Dorback Burn;
- Presence of some built infrastructure associated with A940 route, transmission power line and the operational Paul's Hill and Berry Burn Wind Farms;
- Dual role as key backdrop to lowland Moray landscapes, as a series of well-defined hills containing and shaping the Broad Farmed Spey Valley, and as a visible distant long ridge as seen from the well settled Coastal Farmland;
- Western hills of this LCT form a prominent 'edge' to the Dava Moor and Lochindorb Basin;
- Southern hills of this LCT provide distant backdrop to the CNP;
- Less accessible than other LCTs with a sense of seclusion and naturalness;
- Presence of operational Berryburn and Paul's Hill Wind Farms reduces sense of wildness;
- Limited accessibility limits views into the interior uplands.

MWELCS Sensitivity

- Overall High-Medium sensitivity to Very Large typology (>130m turbines) located within this LCT, due to the inter-visibility that would occur with the operational turbines present in this landscape, the undeveloped nature of this landscape and other landscape and visual constraints.

MWELCS Guidance relevant to proposed development

- Some very limited scope has been identified for very large turbines around 150 m high to be accommodated in this more extensive upland landscape;
- Turbines should be set well back into the core of upland areas, avoiding being sited on or nearby the landmark hills of Knock of Braemoray, Carn Biorach and Roy's Hill. Development on these landmark hills and other higher hills within this character type would impact on views from key scenic routes into Moray which include the A940, A920 and A941, and could also affect views and the setting of Dava Moor and Lochindorb in neighbouring Highland;
- Turbines should be sited to avoid smaller scale more complex landform and lochans lying to the north of Carn Kitty;
- Views from the minor road between Dallas and Knockando should be protected with turbines being sited well back from the diverse moorland and regenerating woodland which provides an attractive feature particularly to the west of this route;
- Significant cumulative effects experienced from the Dava Way and from the minor Knockando to Dallas road should be avoided;
- Turbines of this size should be sited to minimise cumulative effects with smaller turbines within nearby operational and consented wind farms in key views;
- Repowering of operational wind farms located within the less sensitive interior of these uplands (and therefore distant from key views from roads and settlement) is likely to provide most scope for accommodating turbines of this size whilst minimising landscape and visual effects.

Broad Farmed Valley LCT (7)

6.7.19 The Broad Farmed Valley landscape (LCT7) is identified in the Moray Wind Energy Landscape Capacity Study (MWELCS, 2017) as the only lowland LCT of this particular type within Moray and covers the enclosed valley of the River Spey. This LCT gradually merges with the adjacent Open Rolling Uplands LCT11 and Upland Moorland and Forestry LCT10 located to the north-east of LCT7 and the Open Uplands with Steep Sided Slopes LCT12a which form dominant skylines surrounding the Spey Valley.

6.7.20 Two single turbine developments are located in this LCT at Archiestown and Ardoch Farm but large and very large typology turbines are visible on the uplands surrounding the Spey Valley, located in the neighbouring upland LCTs of the Rolling Forested Hills to the east LCT9, Upland Moorland with forestry LCT10 and Open rolling uplands LCT11. They include the operational developments of Hill of Towie I, Rothes I and II and Paul's Hill, together with the consented Hill of Towie II Wind Farm.

6.7.21 LCT7 is located 2.4 km from the nearest proposed turbine.

Key characteristics

- Regular settlement pattern as a well settled valley featuring a number of distinctive planned settlements, castles and historic distillery buildings together with some more recent distillery buildings with a more industrial appearance;
- Increased scale and less dense settlement on broader slopes at transition with the moorland plateau of LCT10;
- Ben Rinnes, Ben Aigan and Paul's Hill all form prominent landmark features on the skyline;
- Small rounded hills occur on the edge of the valley fringing the broader upland LCTs 9, 10 and 11;

- Operational wind farm development located in adjacent upland landscapes and visible from some roads and settlements within the valley;
- Strongly contained narrow, incised valley to the south-west with predominantly wooded side slopes, opening out to a broader floodplain north of Craigellachie;
- Numerous tributary rivers and burns join the Spey through narrower side valleys;
- Riparian woodland consisting of mixed birch and pine woodlands and Policy woodlands associated with estates located on lower valley sides create a diverse vegetation pattern reinforcing smaller scale of landscape;
- Broader and open around Archiestown and south-west of Aberlour with undulating valley sides containing more gently sloping terraces accommodating mixed farmland and small woodlands that merge more gradually with adjacent uplands;
- Distinct sense of place associated with the production of whisky;
- Well wooded nature of LCT often screens views from lower roads such as the A95, although some more open valley sections allows longer views from parts of the A941 and B9015;
- Strong focus on recreational activities such as fishing, walking and cycling including strong linear feature of the Speyside Way long distance footpath;

MWELCS Sensitivity

- Overall High sensitivity to Medium, Large and Very Large typology (>50m turbines) located within this LCT.

MWELCS Guidance relevant to proposed development

- The Hill of Towie I and Paul's Hill I Wind Farms are more visually prominent from settlement and main roads within the Spey Valley. The partial screening provided by Roy's Hill to the Paul's Hill I Wind Farm, the relatively limited extent of both these developments and their location on lower sections of skyline minimise landscape and visual effects on the Spey Valley;
- Key cumulative issues are likely to arise with further wind farm development extending along the skyline of the uplands containing the Spey Valley and increased where turbines were large and/or sited on the outer edges of the uplands in closer proximity to this landscape and to roads and settlement.
- Potential sequential effects are likely to arise on views from the A95 and other roads, including the minor road between Dallas and Knockando.
- The protection of the key landmark hills of Roy's Hill, Carn na Cailliche, Ben Aigan and Ben Rinnes, located on the edges of the Moray uplands, will be important to reduce impacts on sensitive skylines and limit the extent and influence of wind farm development visible from the Spey Valley.
- Key constraint to development include the popularity of the Spey Valley for tourism and the distinct sense of place associated with whisky production and the setting of historic houses and castles and their designed landscapes, settlements and traditional distilleries;
- Opportunities for wind farm development exist in the broader, upper valley sides with a simple and more gently undulating landform lying at the transition with the less dramatic upland areas which could best relate to smaller turbines.
- No scope has been identified for wind turbines over 50m high in this landscape. This landscape character type is sensitive to wind farm development sited on the outer edges of adjoining upland areas where it may form a prominent feature in views from settlement and important tourist routes such as the A95 and could have cumulative effects with other operational wind farms. It will be important to avoid a dominant effect in terms of the size of turbines, their proximity to key views and the extent of development seen on containing skylines.

Upland Moorland and Forestry LCT (10)

6.7.22 The Upland Moorland and Forestry landscape (LCT10) is identified in the Moray Wind Energy Landscape Capacity Study (MWELCS, 2017) as the only upland LCT of this particular type within Moray. It gradually merges with the higher and more defined hills of the Open Rolling Upland LCT11 located to the south-west of LCT10. The broad upland plateau of LCT10 provides a transitional upland landscape between the rolling hills of LCT11 and the lower lying hills of the Rolling farmland sub-types LCT5.

6.7.23 The operational Rothes I and II Wind Farms are located within the broader eastern part of this upland plateau LCT. The consented Meikle Hill and Kellas Wind Farms would be located close to these operational developments and the consented Hill of Glaschyle Wind Farm would be located toward the western edge of this LCT.

6.7.24 LCT10 is located 2.8 km from the nearest proposed turbine.

Key characteristics

- Extensive and isolated landscape;
- Generally large scale landscape but reduced scale within occasional narrow glens such as the Glen of Rothes and at the transition with the more complex landform of the Upper Lossie Valley;
- Gently undulating plateau with smooth, even slopes, shallow basins and rounded summits;
- More complex landform south-west of Dallas at the transition with the Rolling farmland and Forests with valleys subtype where incised valleys, knolly topography and lochans occur;
- Simple land cover of extensive forestry and grass/heather moorland with occasional boggy basins between hills;
- Sparsely settled with isolated farms located within the Glen of Rothes and hill slopes towards the fringes of this LCT;
- Presence of operational wind farms within the lower lying basins of this landscape, together with masts and power lines crossing this LCT;
- Despite seclusion and restricted access throughout LCT, no sense of wildness owing to the presence of commercial forestry and operational wind farm development.
- Restricted access and visibility of the interior of this upland plateau;
- Two public roads cross the LCT, the A941 through the Glen of Rothes with contained views and the single track unclassified road between Spey Valley and Dallas. Forest and wind farm tracks provide access to the interior of these hills although limited public access;
- Limited visibility from LCT7 Spey Valley;
- Forms a distant long, low ridge and a level skyline from the coastal farmlands LCT4 of north Moray;
- Distinctive hills of Mill Buie and Brown Muir form landmark features in views from the north;
- Carn na Cailliche and Hunt Hill provide important containment of the lower lying upland core in views from the south and from the Spey Valley LCT7.

MWELCS Sensitivity

- Overall High-Medium sensitivity to Very Large typology (>130m turbines) located within this LCT.

MWELCS Guidance relevant to proposed development

- The close proximity of the Berry Burn Wind Farm located in the adjacent Open Rolling Uplands (11) to the narrower extent of the Upland Moorland and Forestry (10) in the west may result in potential close inter-visibility

of developments although extensive woodland cover and isolation from settlement and roads may also limit cumulative effects experienced on the ground;

- Sequential and simultaneous visibility of multiple wind farm developments sited within this character type and the Open Rolling Uplands (11) from the Dava Way. The Berry Burn Wind Farm is already visible and there will also be close views of the consented Hill of Glaschyle Wind Farm from this recreational route. Open Upland with Steep Slopes LCT (12a);
- Cumulative effects on views from the minor road between Knockando and Dallas where operational wind farms are already visible but are relatively well set back. The consented Meikle Hill Wind Farm will lie very close to the eastern side of this road and any further development seen in close proximity to the west could create a dominant 'corridor' effect and potentially affect the sense of wildness that can be experienced from this hill pass;
- Sequential and simultaneous views from the A940 which provides a scenic approach to Moray over Dava Moor. The consented Hill of Glaschyle Wind Farm will be prominent in views from rare open spaces along this route and additional development on the small wooded hills which lie on the western extent of this character type could result in significant cumulative effects;
- Increases in the extent and prominence of wind farm development seen on skylines above the Lossie Valley in the Dallas/Kellas area. The operational Rothes I and II Wind Farm is already visible in the east and the consented Meikle Hill and Kellas Wind Farms will increase visibility of turbines towards the west;
- The need to minimise effects of wind farm development seen on immediate and sensitive skylines above the Broad Farmed Valley (7). The well-settled nature of the Spey Valley and its popularity with tourists increases visual sensitivity;
- The small scale and richly diverse upper Lossie Valley to the south-west of Dallas would be particularly sensitive to large turbines sited on the hills which contain this valley;
- Significant cumulative effects on the Dava Way and on the A95, which is well-used by tourists, should be avoided;

Open Upland with Steep Slopes (12a) LCT

6.7.25 The Open Upland with Steep Slopes (LCT12a) is identified in the Moray Wind Energy Landscape Capacity Study (MWELCS, 2017) as a sub-Type to the Open Uplands and Farmed Valley LCT12 and occurs in the south-eastern part of Moray close to the CNP and Aberdeenshire boundaries. There are two separate narrow areas of LCT12a separated by the Narrow Farmed Valley LCT13 of Glen Rinnes.

6.7.26 The southern LCT12a area borders the other LCT12 sub-Type, Open Uplands with Settled Glens LCT12b which would contain the consented Dorenell Wind Farm which stretches across the Scaul Hill to Cook's Cairn ridgeline. The operational Rothes I and II Wind Farms, Berry Burn, Paul's Hill I and Hill of Towie I are all visible from hill summits and ridges within this LCT.

6.7.27 LCT12a is located 8.4km from the nearest proposed turbine.

Key characteristics

- Narrow and limited in extent, particularly where it forms the containing edge to the Glen Rinnes LCT13, Glen Livet and the Spey Valley LCT7;
- Appears more extensive in scale where is merges with the Open Uplands with Settled Glens LCT12b to the east and with the Ladder Hills of the CNP to the south.
- Rugged group of outlying Landmark Hills of Ben Rinnes, Meikle Conval and Little Conval are widely visible and form key foci.
- Large scale, vertical sided often narrow ridgelines rise directly from adjacent valleys to elevation above 700m;
- Fringe areas of this LCT show signs of smaller scale due to presence of woodland and smaller topographical features and lower lying stand-alone hills to the northern end of Glen Rinnes providing a backdrop to Dufftown;
- Steep sided slopes are a key characteristic of this LCT, they form enclosure which reduces the scale of the adjacent valleys;
- Simple land cover of heather moorland;
- Occasional improved grassland fields along lower hill slopes which merge with grassland within the farmed lower lying land;
- Mixture of quite extensive coniferous woodlands and smaller shelterbelts along lower hill slopes;
- Sparsely settled landscape with isolated farms within sheltered valleys on the fringes of LCT;
- Short stretches of public road extending through narrow passes, presence of farm and forestry tracks but generally limited public access;
- Consented Dorenell adjacent to this LCT, which when built will reduce wild land qualities owing to extensive visibility and proximity to this LCT;
- Some sense of wildness and relative seclusion owing to remoteness, limited access and semi-natural moorland character, although this LCT is narrow in extent and settled lowlands in close proximity;
- Popular with walkers owing to fine views from Ben Rinnes;
- Highly inter-visible from surrounding area and from key summits and ridges within the character type;

MWELCS Sensitivity

- Overall High sensitivity to Medium and Large typologies (>50m turbines) located within this LCT.

MWELCS Guidance relevant to proposed development

- Views from the top of Ben Rinnes to surrounding high ridges and landmark hills which already feature a number of wind farms to the north. The consented Dorenell Wind Farm will be seen in much closer proximity than these operational developments.
- Key issue is the erosion and diminution of the qualities of wildness associated with Moray's landscapes and the sense of seclusion experienced from hill tops and more remote glens – there are few upland areas left in Moray where there are no wind farm developments either built or consented.
- Potential cumulative effects on views from the neighbouring Broad Farmed Valley (7) where the Hill of Towie I and Paul's Hill I Wind Farms are already visible.
- Potential views from roads such as the A95, A941 and B9009 – routes which are often used by tourists - and views from Ben Rinnes and other hills popular with walkers.
- Cumulative effects with the consented Dorenell Wind Farm located in the adjacent Open Uplands with Settled Glens (12b).

Coastal Farmland LCT (4)

6.7.28 The Coastal Farmland (LCT4) is identified in the Moray Wind Energy Landscape Capacity Study (MWELCS, 2017) as an extensive low-lying plain spanning east to west across Moray, in a broad band of land backing the coastal Margin landscapes LCTs1-3 which lie to the north.

6.7.29 Four operational turbines are present in the western fringes of this LCT at Findhorn, all below 50m in tip height and are most visible across the open western part of this LCT. Operational wind farms located within the uplands to the south are generally more visible from coastal areas and from eastern parts of the LCT, between Elgin and Fochabers which do not benefit from the screening provided by the wooded ridges of the Rolling Farmland with Forests and Valleys, LCT5b.

6.7.30 LCT4 is located 16.6km from the nearest proposed turbine.

Key characteristics

- Extensive low lying, open plain;
- Subtly undulating landform with occasional landmark hills and ridges including Spynie ridge near Elgin and Tappoch and Binn Hill near the coast;
- Low, distinct ridgeline between Burghead and Lossiemouth separates this LCT from the coastal margin landscape in this area;
- Well settled, highly managed landscape with regular pattern of farms, houses and settlements;
- No sense of wildness or strong perceptual qualities owing to well settled character;
- RAF air fields and associated buildings and infrastructure including tall masts are concentrated in the Kinloss, Lossiemouth and Burghead area;
- Occasional historical buildings including the Old Castle of Duffus, Palace of Spynie and grand houses/castles with designed landscapes and church spires form landmark features;
- Occasional industrial features of large warehouses, maltings and some quarrying and landfill sites;
- Well-developed network of roads and some transmission lines;
- Pockets of very simple landform such as the broad floodplains of the Spey and Lossie and a very low lying swathe of drained land between Lossiemouth and Kinloss;
- Pockets of more complex rolling landform occur in Urquhart and Lhanbryde area and knolly hills north east of Elgin;
- Simple landcover pattern of large arable fields with coniferous plantations close to the coast and Spey Valley;
- Small pockets of more diverse land cover pattern are associated with the policies of mixed shelterbelts, parkland and avenues of Innes House, Gordon Castle, Brodie Castle and Gordonstoun;
- The Rothes I and II and Hill of Towie I Wind Farms are visible north and east of Elgin seen on the skyline of the distant uplands of the Upland Moorland and Forestry (10) and Broad Forested Hills within Upland Farmland (8a) at distances of between 10 and18km;
- Unimpeded views possible from open sections of the A96 and dense criss-crossing network of minor roads;
- Forestry and subtle ridges limit views from other areas of the LCT;
- Ben Rinnes, Ben Aigan and Brown Muir hills form key features in views to the south;
- The Moray Firth and distant Sutherland coast feature in views to the north;

MWELCS Sensitivity

- Overall High-Medium sensitivity to Medium and Large typologies (>50m turbines) located within this LCT.

MWELCS Guidance relevant to proposed development

- The prominent small hills and ridges which rise abruptly from the low-lying coastal plain including Binn Hill and Tappoch close to the coast and Cluny Hill close to Forres provide key vantage points;
- The openness of this landscape and its well-settled character which increases visual sensitivity;
- Views are long distance and tend to focus on the uplands of Moray to the south but with views to the sea often screened by forest or landform from lower-lying areas.

Rolling Farmlands and Forest and Valleys LCT (5a)

6.7.31 The Rolling Farmlands and Forest and Valleys (LCT5a) is a sub-type of the Rolling Farmland and Forests (LCT5) which extends east to west across Moray, in a broad band of land forming a transition between the coastal plain and the uplands. LCT5a comprises the Lossie and Pluscarden Valleys.

6.7.32 A single operational wind turbine, 61m high to blade tip, is located in this LCT. The operational wind farms of Rothes I and II are located in the adjacent Upland Moorland and Forestry (10) and are visible in relative proximity from the Lossie Valley in the Kellas/Dallas area. The consented wind farms of Meikle Hill and Kellas are also located within the Upland Moorland and Forestry (10) and will increase the extent of turbines seen on the upland skyline in the Lossie Valley in the Kellas/Dallas area.

6.7.33 LCT5a is located 7.5km from the nearest proposed turbine.

Key characteristics

- This LCT forms a transition between the higher hills of the Upland Moorland and Forestry (10) and the low-lying coastal plain of the Coastal Farmlands (4);
- Strongly contained landscape;
- Comprises the broad Valleys of Pluscarden and the upper Lossie and the two ridges which separate them forming an alternating pattern of ridge-valley-ridge-valley;
- Three distinct, though relatively low lying ridges below 320m AOD, are key backdrop features to the internal valleys and neighbouring LCTs and comprise Heldon Hill, the southern ridge of Hill of Mulundie to Hill of Wangie and the curving ridge of Quarry Wood which wraps around Elgin and extends the LCT to the north-east;
- Both Heldon Hill and Hill of Wangie ridges feature a steep south-east facing scarp slopes and long gentler dip slopes to the north-west, exhibit narrow, gently undulating ridge tops with the Hill of the Wangie and Heldon Hill forming subtle rounded summits.
- Extensive woodland cover limits openness;
- The more open valley floors and lower sides accommodate a dispersed pattern of small farms and houses, enclosed fields and woodlands;
- Small complex knolls and river terraces pattern the lower southern slopes of the Lossie in the Kellas area;
- Mixed land cover pattern comprising forested ridges, mixed policy woodlands on lower slopes on the edges of the valleys and pastures on the flatter valley floors.
- Well-settled valleys with regular pattern of small farms, cottages and small settlements such as Rafford and Dallas;
- Distinct historical associations owing to the historic houses with associated designed landscapes and the landmark feature of Pluscarden Abbey;
- The steep scarp slopes of the ridge of Heldon Hill form an important part of the landscape setting of Pluscarden Abbey;
- Sense of naturalness lessened by extensive forestry, visible wind farm development and transmission line;
- Narrow public roads and steep private tracks within the forested ridges;
- A promoted viewpoint is located on the western end of the Heldon Hill ridge;
- The upper Lossie Valley is particularly open and features views to the adjacent Upland Moorland and Forestry (10) including the operational Rothes I and II Wind Farms;
- The Paul's Hill Wind Farm can be glimpsed from the minor road at the upper end of the Pluscarden Valley near Hazelbank.
- The consented Kellas and Meikle Hill Wind Farms will also increase the extent of turbines seen on the skyline particularly in the Dallas area;
- No visibility of nearby wind farms from the more contained Pluscarden Valley.

MWELCS Sensitivity

- Overall High sensitivity to Medium and Large typologies (>50m turbines) located within this LCT.

MWELCS Guidance relevant to proposed development

- Sequential visual impacts experienced when travelling through this landscape is a potential constraint;
- The well-settled nature of the valleys within the character type and the recreational use of Heldon and Quarry Woods which increase visual sensitivity;
- The setting of historic houses such as Kellas and Dallas Lodge and their designed landscapes and the setting of the landmark feature of Pluscarden Abbey.

MN10: Open Uplands LCA

6.7.34 MN10 Open Uplands Landscape Character Area (LCA) is identified in the Moray and Nairn Landscape Assessment (MNLA) (SNH No.101, Turnbull Jeffrey Partnership, 1998) and forms a westwards extension of the LCT11 Open Rolling Uplands as identified in the MWELCS, 2017. MN10 extends into the Strathdearn Hills which form the 'foothills' of the Cairngorms on the northern boundary of the CNP. This LCT also includes a thin strip of landscape between LCT11 and CNG2 to the south-west of the proposed development. This part of the LCT is located 1.8 km to the south-west of the proposed development with the main part of this LCT located 14.4 km at its nearest point to the west of the proposed Paul's Hill II Wind Farm development.

6.7.35 The consented wind farm development of Cairn Duhie would be present on the eastern boundary of this LCA, to the west of Knock of Braemoray landmark hill which visually separates the Cairn Duhie landform from Moidach More and LCT 11.

Key characteristics

- Large scale, open landscape
- Series of rounded hills of uniform height, broad, smooth ridges and gently undulating plateaux punctuated by occasional rocky outcrops and craggy incised valleys cut into the moorland by small burns;
- Few minor roads cross the LCA;
- The open water of Lochindorb forms a unique landscape feature
- Simple land cover of heather moorland and blanket bog with pockets of stunted native pine with evidence of muir burning creating a distinctive pattern of colour and texture on some of the open slopes;
- Sparse settlement with derelict farmsteads present;
- Contrast evident between the openness of these uplands and the dense wooded coastal farmland of Moray and the Spey Valley;
- Extensive natural regeneration of native pine and birch in some areas;
- Feeling of wildness in remoter areas of this open moorland landscape.

MNLA Sensitivity

- Potentially sensitive to change due to present open character and visual contrast with Coastal farmland and Spey Valley;

MNLA Guidance relevant to proposed development

- Wind farm development could possibly be visually accommodated in the more accessible and obviously human influenced parts of this landscape, provided the general openness of the landscape was not cluttered by a profusion of wind turbines and ancillary developments such as connecting power lines and access roads;
- Wind farm development should be avoided adjacent to roads and on prominent hill tops, where it may intrude on views northwards over Moray or south towards Benn Rinnes.

CNG2: Uplands and Glens LCT: Strathdearn Hills (Area 4)

6.7.36 The Landscape Character Area of the Strathdearn Hills is a geographically distinctive character area within the broad umbrella Landscape Character Type of the Uplands and Glens, CNG2, as identified in the Cairngorms Landscape Assessment (CLA) (SNH No.75, Turnbull Jeffrey Partnership, 1996). The Strathdearn Hills LCA 4 share many characteristics with the MN10 Open Uplands LCT as identified in the Moray and Nairn Landscape Assessment (MNLA) (SNH No.101, Turnbull Jeffrey Partnership, 1998), and the Strathdearn Hills do indeed continue beyond the boundary identified in the CLA to merge with the open uplands character type. At the CNP boundary, CNG2: Area 4 then overlaps with the LCA 82 The Strathdearn Hills identified in the 2009 CNPLCA which supercedes Area 4 LCA as an updated assessment. LCA82 has been scoped out of the final LVIA assessment due to limited visibility and its location further from the proposed development than CNG2 Uplands and Glen LCT: Strathdearn Hills, Area 4, as detailed in Appendix A6.3. This is shown by Figure 6.4 which indicates the part of Area 4 included in this assessment although the LIA does take into account the full extent of Area 4 in terms of determining its sensitivity and overall magnitude and effect on the LCA as a whole.

6.7.37 Area 4 (Strathdearn Hills) of CNG2: Uplands and Glens LCT is located 2.2 km from the nearest proposed turbine.

Key characteristics

- Range of large scale hills with long, shallow slopes, broad smoothed ridges and rounded peaks rising to 600m AOD;
- The generally even hill slopes are broken in places by rocky outcrops and punctuated by small patches of scree and boulders;
- Expansive, elevated Dava Moor included in northern part of LCA;
- A pattern of broad glens cut into the hills aligned north to south allow views into the interior core of this landscape from the Spey Valley;
- Simple vegetation pattern consisting of a smooth blanket of heather moorland which emphasises the rounded landform;
- Some pockets of native pine and muir burning creating distinctive irregular pattern of different colours and textures in places;
- The lower hill slopes and valleys comprise areas of rough grass and isolated, bright green fields of semi-improved pasture with occasional small coniferous plantations;
- Natural regeneration of Scots Pine is a feature on Dava Moor;
- Fragmented broadleaved woodlands are located next to farmsteads and on the fringes of waterbodies;
- Sparsely settled with scattered distribution of farmsteads gives a 'marginal appearance' and a remote feel to the LCA, further reinforced by the presence of the ruined castle on Lochindorb which also creates a sense of history.
- Remoteness leads to sense of naturalness and wildness particularly in the less accessed parts of the LCT.

6.7.38 The CLA does not provide a sensitivity assessment of the LCA or guidance relevant to the proposed wind farm development.

CNG2: Uplands and Glens LCT: The North-Eastern Hill Ranges (Area 6)

6.7.39 The Landscape Character Area of the North-Eastern Hill Ranges is a geographically distinctive character area within the broad umbrella Landscape Character Type of the Uplands and Glens, CNG2, as identified in the

Cairngorms Landscape Assessment (CLA) (SNH No.75, Turnbull Jeffrey Partnership, 1996). The North-Eastern Hill Ranges Area 6 is an extensive LCA covering most of the eastern part of the CNP area. Only a small part of the North-Eastern Hill Ranges LCA 4 lies outwith the MWELCS and the Cairngorms National Park Landscape Character Assessment (CNPLCA) (2009) and is relevant to this full assessment. This small part corresponds to the northern end of the Cromdale Hills bordering the Spey Valley. At the CNP boundary, CNG2: Area 6 then overlaps with the LCA 83 The Hills of Cromdale identified in the 2009 CNPLCA which supercedes Area 6 LCA at the park boundary as an updated assessment. LCA83 has been scoped into the final LIA assessment. This is shown by Figure 6.4 which indicates the part of Area 6 included in this assessment although the LIA does take into account the full extent of Area 6 in terms of determining its sensitivity and overall magnitude and effect on the LCA as a whole.

6.7.40 Area 6 (The North-Eastern Hills) of CNG2: Uplands and Glens LCT is located 6.6 km from the nearest proposed turbine.

Key characteristics

- Range of hills characterised by their relatively low and rounded summits, gently slopes and long, smooth, interlocking spurs;
- Small burns cut shallow valleys into the hillsides;
- Glacial deposits found within valleys;
- Simple vegetation pattern consisting of a smooth blanket of heather moorland which emphasises the rounded landform;
- Rough grass and moss cover the lower slopes and the wetter, flatter valley floors;
- Some pockets of native pine and birch together with small broadleaved woodlands in the more sheltered valleys create some tree cover;
- Occasional small coniferous plantations, poorly integrated with the rolling character of the hills;
- Sparsely settled with scattered farmsteads confined to the valley floors and lower slopes;
- Strong sense of remoteness due to openness of landscape and views toward Cairngorms massif.

6.7.41 The CLA does not provide a sensitivity assessment of the LCA or guidance relevant to the proposed wind farm development.

CNG3: Cairngorm Straths LCT: Lower Spey (14)

6.7.42 The Landscape Character Area of the Lower Spey is a geographically distinctive character area within the broad umbrella Landscape Character Type of the Cairngorm Straths, CNG3, as identified in the Cairngorms Landscape Assessment (CLA) (SNH No.75, Turnbull Jeffrey Partnership, 1996). Only a small proportion of the Lower Spey LCA 14 is relevant to this full assessment. This small part corresponds to the section of the Spey Valley between Ballindalloch and Advie.

6.7.43 Area 14 (The Lower Spey) of CNG3: Cairngorm Straths LCT is located 6.6 km from the nearest proposed turbine.

Key characteristics

- The foothills of Ben Rinnes and Hills of Cromdale to the south constrict and shape this section of the Lower Spey to form a more enclosed landform and relatively narrow, deep and winding river channel;
- Visually diverse vegetation cover comprising broadleaved woodlands following the Spey, more extensive coniferous plantations generally covering the hill tops; native pine and ornamental trees within policy woodlands; pastures, some enclosed by stone dykes and shelterbelts, contrast with the coarser textures of unimproved pastures and duller hues of open grass and heather moorland on hill tops.
- A number of distilleries are aligned close to the Spey and these are foci in the landscape;
- Diverse settlement pattern comprising the planned settlements of Grantown on Spey and Aberlour which sit as if 'rooted ' within the landscape, contained and partially screened by mixed woodlands; isolated traditional houses and farmsteads nestle on the fringes of woodland or, in some instances, set within policy woodland and parkland.

6.7.44 The CLA does not provide a sensitivity assessment of the LCA or guidance relevant to the proposed wind farm development.

Hills of Cromdale LCA (83)

6.7.45 The Landscape Character Area of the Hill of Cromdale (LCA83) is identified in the Cairngorms National Park Landscape Character Assessment (CNPLCA) (2009). The key characteristics also consider the attributes which contribute to the distinctiveness of this LCA.

6.7.46 LCA83 is located 9.2 km from the nearest proposed turbine.

Key characteristics

- Panoramic views south to the North Eastern Hills and the Cairngorm massif;
- Easily recognisable spine of hills orientated south west to north-east, with uniformly rounded summits and formidable flanks incised by deep river valleys to form drier ridges;
- Consistent pattern of land cover consisting of managed heather/blaeberry dominated grouse moor with pattern of burning evident on the moorland. Some areas of peat bog along the central spine of summits;
- Sparse settlement pattern, though well defined as farms, some of which have been abandoned, are all located to take advantage of tributaries and slight shelter from the valleys formed by the watercourses. These farms consistently sit along the lower fringe of the hill slopes, just at the point where the gradient softens to form the valley floor or lower foothills and are often the focus of small, conifer shelter woods.
- Occasional traces of prehistoric and pre-improvement settlements are evident around the lower slopes providing strong historical associations;
- The hill spine forms the enclosure and visual backdrop to adjacent Strath Avon, the Haughs of Cromdale and the Glen of Dalvey;
- Several vehicle tracks and smaller access routes extend into and cross the hills linking Strath Avon with Cromdale.

6.7.47 The CNPLCA does not provide a sensitivity assessment of the LCA or guidance relevant to the proposed wind farm development.

Landscape fabric and character of the proposed development area

6.7.48 The proposed development area of Paul's Hill II Wind Farm lies within the Open Rolling Upland Landscape Character Type (LCT11), as identified in the Moray Wind Energy Landscape Capacity Study (MWELCS, 2017) and described in detail in section 6.7.17. It is positioned north of Roy's Hill, to the east of the operational Paul's Hill Wind Farm development and to the south of Blarnish Burn. The road pass which cuts through the adjacent upland moorland and forestry LCT10 and connects the Spey Valley with the settlement of Dallas (the Upper Knockando to Dallas unclassified road) is located to the North-east of the development. The A95 and B9102 passing through the Spey Valley, run to the south of the development.

6.7.49 The development area exhibits typical characteristics of the open rolling upland landscape. It comprises the broad, smooth northern slopes of Roy's Hill and the simple land cover of grass and heather moorland. It is sparsely settled with isolated properties such as Corglass, Glenarder and Leakin Farms scattered along the shallow valleys such as the Allt Arder cut by the many burns flowing into the River Spey.

6.7.50 The proposed development has been located 'behind' the landmark hill of Roy's Hill as viewed from the south from the Spey Valley and keeps to the south of Blarnish Burn, north of which the landscape character starts to become more complex and smaller in scale culminating in the smaller scale series of lochans with variable topography north of Carn Kitty and Carn Shalag. The presence of the operational Paul's Hill Wind Farm and Berry Burn Wind Farm, located on the western slopes of Carn Kitty and adjacent to the complex lochan landscape reduce the sense of wildness of this part of the open uplands landscape. To the east of the proposed development area, the landscape evens out to merge with the undulating plateau of the Upland Moorland and Forest landscape LCT10 with predominant characteristics of this character type evident in the slacker slopes and extensive forestry plantations of Glen Lossie, north of Upper Knockando and aligned with the unclassified upper Knockando to Dallas road route.

6.7.51 Roy's Hill and Carn Kitty are both identified in MWELCS 2017 as Landmark Hills. Roy's Hill is described as follows:

6.7.52 *'Prominent in views from the Spey Valley and tourist routes such as the A95 where its steep open heathery slopes form an immediate backdrop to the Spey and also Ballindalloch Castle designed landscape. This hill is additionally important in visually containing the Paul's Hill Wind Farm. Wind farm access tracks appear to be used by mountain bikers and walkers. The summit of this hill has extensive views to the Cairngorms.'*

6.7.53 Carn Kitty is described as follows:

6.7.54 *'Not widely visible but forms distinct high point within the Open Rolling Uplands (11) and is glimpsed from the Upper Knockando to Dallas road. This hill is surrounded by the operational wind farms of Berry Burn and Paul's Hill.'*

6.7.55 Within both the open rolling uplands and upland moorland landscapes, the MWELCS (2017) identifies *'very limited scope for very large turbines [>130m] around 150m high'*,(MWELCS 2017, p.77)owing to *'the simple landform and large scale of the interior plateau areas and sparsely settled nature and less visible eastern parts of the character type'* (MWELCS 2017, p.77) which, it is considered in this LVIA, reduce the visual sensitivity and relate well to wind farm development. The MWELCS also states that *'a number of operational wind farms already influence landscape character and views'* (MWELCS p.76). It is further considered in this LVIA, the reduced perceptual quality of wildness and naturalness, owing to the presence of operational developments such as Paul's Hill, Berry Burn and Rothes I and II further reinforce the suitability of wind farm development within the proposed development area.

Designated Landscapes

6.7.56 The criteria used to define designated landscapes varies greatly and are generally defined within landscape planning policy and documentation. The level of designation also varies between internationally acclaimed landscapes, nationally recognised landscapes and local landscape designations, identified by each Local Planning Authority. There are no internationally recognised landscape designations within the study area.

6.7.57 The national and local landscape designations present within the 40 km study area are identified in Figure 6.5.

6.7.58 The first stage initial assessment of potential effects on this designated landscape baseline was carried out in section 13.6.2 of the scoping report in order to identify those designated landscapes with the potential to experience significant effects and therefore requiring detailed assessment in the LIA.

6.7.59 The Nationally designated landscapes of the Cairngorms National Park, the Cairngorms National Scenic Area and the Cairngorms Wild Land Area and Monadhliath Wild Land Area were all included in the initial assessment.

6.7.60 The Moray Local Landscape designations are identified as Areas of Great Landscape Value (AGLVs) and within the 40 km study area, comprise the Spey Valley, The Findhorn Valley, Pluscarden, Findhorn Bay, and the Moray Shore: Burghead to Lossiemouth AGLV. The Highland Council Local Landscape designations are identified as Special Landscape Areas (SLAs) and within the 40 km study area, comprise the Drynachan, Lochindorb and Dava Moors SLA and the Cromarty Sutors, Rosemarkie and Fort George SLA. These were all included in the initial assessment.

6.7.61 Eight Gardens and Designed Landscapes listed by Historic Environment Scotland in the Inventory of Gardens and Designed Landscapes were identified within the 40 km study area and indicating theoretical visibility as identified in Figure 6.5. These were included in the initial assessment, taking into account the sites' special significance and potential for significant effects.

6.7.62 The findings of this initial assessment were agreed through the scoping consultation process and are included in Appendix A6.3 for ease of reference.

6.7.63 Three designated landscapes have been identified as landscape receptors with the potential to experience significant landscape effects and are taken through to be assessed in detail in the LIA. These include one nationally recognised designation and two local landscape designations identified by Highland Council and Moray Council and are as follows:

- Cairngorms National Park (NP)
- Drynachan, Lochindorb and Dava Moors Special Landscape Area (SLA);
- Spey Valley Area of Great Landscape Value (AGLV).

6.7.64 The following sources have been used to identify the key characteristics, Special Qualities and reasons for designation of the three designations and to assist with their baseline description:

- Cairngorms NP Local Development Plan (2015)
- Scottish Natural Heritage and Cairngorms National Park Authority (2010). The special landscape qualities of the Cairngorms National Park. *Scottish Natural Heritage Commissioned Report, No.375 (iBids and Project no 648).*
- Cairngorms National Park Partnership Plan 2012-2017 and Cairngorms National Park Partnership Plan 2017-2022 Consultation.
- Assessment of Highland Special Landscape Areas, Horner & Maclennan, The Highland Council, SNH (2011)
- Moray Local Development Plan (Moray LDP) (2015)

Cairngorms National Park

6.7.65 The Cairngorms National Park Partnership Plan (p.5) sets out the fours aims set out by Parliament that are shared by Scotland's National Parks with greater weight given to the first aim in the event of conflict between the aims, *(section 9.6 of the National Parks (Scotland) Act)*. This is a sustainable development approach in which conservation of the natural and cultural heritage underpins the economic and recreation value of the National Park. These aims are:

- *to conserve and enhance the natural and cultural heritage of the area;*
- *to promote sustainable use of the natural resources of the area;*
- *to promote understanding and enjoyment (including enjoyment in the form of recreation) of the special qualities of the area by the public;*
- *to promote sustainable economic and social development of the area's communities.*

6.7.66 The Cairngorms National Park (CNP) is the largest National Park in the British Isles and covers 4,528 square kilometres, including the Cairngorms mountain range and surrounding hills, stretching from north of Grantown on Spey to Dalwhinnie and Killiecrankie and east beyond Ballater. The two National Scenic Areas of The Cairngorm Mountains and Deeside and Lochnagar NSAs and the Cairngorms Wild Land Area lie within the Park boundary, prompting the identification of the special qualities of the National Park as a whole to aid the understanding of what

is special about the NP, and assist with the development of management objectives in keeping with the individual qualities. Both the Cairngorm Mountains and Deeside and Lochnagar NSAs were 'scoped out' from further detailed assessment by way of scoping consultation. The Deeside and Lochnagar NSA does not lie within the 40 km agreed study area for assessing potential effects as a result of the proposed Pauls Hill II wind farm development and was therefore not included in the initial assessment. No significant effects are considered to occur within the Cairngorm Mountains NSA owing to the distance and separation from the Proposed Development and the lack of association with the open moorland containing the Proposed Development. Visibility of the Proposed Development from within the NSA is scattered and intermittent and the Special Qualities of this core designation area would remain unaffected by the introduction of the Proposed Development. The Cairngorms Wild Land Area was also 'scoped out' of the detailed LVIA assessment owing to the scattered partial visibility of the Proposed Development and the distance and separation from the Proposed Development. Although a highly valued landscape, it was considered that the strong internal focus of its key characteristics would remain unaffected by the introduction of the distant feature of the Proposed Development. The initial assessments of visibility from the NSA and WLA within the study area are contained in Table A6.8 in Appendix A6-3.

6.7.67 A summary of the Special Qualities of the CNP are listed in the SNH commissioned report *The special landscape qualities of the Cairngorms National Park* (2010) and are included in the table below. The detailed evocative textual descriptions of the Special Qualities are contained in the same SNH report and have been taken into account in the detailed assessment of potential effects on the National Park and on its Special Qualities in section 6.8.27.

6.7.68 The CNP lies 6.7 km from the proposed development at its nearest point.

Special Qualities

Table 6.5: Summary of CNP Special Qualities

Objective characteristic	Special Quality
General Qualities	• Magnificent mountains towering over moorland, forest and strath • Vastness of space, scale and height • Strong juxtaposition of contrasting landscapes • A landscape of layers, from inhabited strath to remote, uninhabited upland • The harmony of complicated curves • Landscapes both cultural and natural
The Mountains and Plateaux	• The unifying presence of the central mountains • An imposing massif of strong dramatic character • The unique plateaux of vast scale, distinctive landforms and exposed, boulder-strewn high ground • The surrounding hills • The drama of deep corries • Exceptional glacial landforms • Snowscapes
Moorlands	• Extensive moorland, linking the farmland, woodland and the high tops • A patchwork of muirburn
Glens and Straths	• Steep glens and high passes • Broad, farmed straths • Renowned rivers • Beautiful lochs
Trees, Woods and Forests	• Dark and venerable pine forest • Light and airy birch woods • Parkland and policy woodlands • Long association with forestry
Wildlife and Nature	• Dominance of natural landforms • Extensive tracts of natural vegetation • Association with iconic animals • Wild land • Wildness
Visual and Sensory Qualities	• Layers of receding ridge lines • Grand panoramas and framed views • A landscape of many colours • Dark skies • Attractive and contrasting textures • The dominance of natural sounds
Culture and History	• Distinctive planned towns • Vernacular stone buildings • Dramatic, historical routes • The wistfulness of abandoned settlements • Focal cultural landmarks of castles, distilleries and bridges • The Royal connection
Recreation	• A landscape of opportunities • Spirituality

Source: p.11 Scottish Natural Heritage and Cairngorms National Park Authority (2010). The special landscape qualities of the Cairngorms National Park. Scottish Natural Heritage Commissioned Report, No.375 (iBids and Project no 648).

Drynachan, Lochindorb and Dava Moors SLA

6.7.69 The Drynachan, Lochindorb and Dava Moor Special Landscape Area (SLA 22) is identified as an area of regional importance for scenic quality. A citation of its key landscape and visual characteristics, its Special Qualities and its Sensitivities to Change is contained in the *Assessment of Highland Special Landscape Areas*, Horner & Maclennan, The Highland Council, SNH (2011). The designation is recognised in Appendix 2 of the Highland-wide Local Development Plan (HwLDP) (2012) which states:

6.7.70 *'The Council will consider the potential impacts of development proposals on the integrity of the SLAs, including impacts on the wider setting. There may be cases where the setting of an SLA could be adversely affected by development in the foreground which would interrupt important views into and out of the SLA. When determining the impact on the landscape character and scenic quality and overall integrity of the SLA, attention will be given to its citation and in particular the Key Landscape and Visual Characteristics, it's Special Qualities, and its Sensitivities to Change.'* (p.153, Appendix 2 HwLDP 2012)

6.7.71 The SLA lies adjacent to the northern boundary of the CNP and 2 km from the proposed development at its closest point.

Key characteristics

- Rounded heather clad slopes and smooth moorland with large expanse of elevated, undulating blanket bog on summits;
- Woodland cover is limited in extent.
- Homogeneity of the area;
- Sense of spaciousness with wide views, and sparse human presence;
- Elements of human intervention are evident within this landscape, most obviously in the form of tracks, fences, muirburn patterns and fencing;
- Strong sense of tranquillity as well as some wildness qualities, which are emphasised by an almost complete absence of built structures;
- There are few buildings or structures, those that are present are of distinct estate architectural character;
- Strongly horizontal composition of elements is dominated by a simple and prominent skyline with occasional foci of small craggy hills, lochans and lodges;
- Uninterrupted views across undulating moorland providing visual connectivity with surrounding landscapes;
- Strong muirburn pattern creating a mosaic of colour and texture across the slopes;
- Land management for grouse shooting is the primary activity;
- Isolated fragments of native pine-birch woodland scattered across the area;
- Moorland plateau is dissected by a series of incised river valleys, many of which are flanked by estate access tracks leading into the moorland core. Distinctive rocky outcrops occur and the more steep-sided valleys, such as that of the River Findhorn at Drynachan, offer enclosed and intimate relief from the surrounding expansive moorland.
- Limited network of public roads through the area, lack of habitation and other built features and open character convey a sense of remoteness and isolation;
- Lochindorb and ruined castle form a key feature amidst the dominant surrounding moorland.

Special Qualities

Key Special Qualities of the SLA include:

- A sense of solitude;
- Views over Heather Moorland; and
- Big skies.

6.7.72 An expanded description of these qualities is as follows:

- Expansive views and broad panoramas across open, rolling moorland and vast skies instil a boundless sense of scale and space, enhanced by the consistency of moorland cover and landform character;
- A narrow, deep section of the Findhorn River Valley at Streens offers enclosed and intimate relief in contrast to the elevated and exposed moorland. Elsewhere, valleys frame views to Lochindorb;
- Land management practices create distinctive abstract muirburn patterns, accentuated by ever-changing weather and light patterns;
- The limited extent of tree cover and human habitation creates a simple yet powerful moorland image of tranquillity, simplicity and isolation which is emphasized by Lochindorb and its ruined castle;
- Where buildings exist, these are of a distinctive estate character. Also building remains from pre clearance farmsteads, with enclosures, head dykes and associated field systems and improved land form one of the few built and 'managed' elements within the landscape. These engender a strong atmosphere which can arouse contemplative emotions of past human endeavour and hardship;
- The long, fairly straight routes through this landscape allow an easy appreciation of the openness and simplicity of the landscape. These are typically lined with permanent snow poles which serve to reinforce the impression that this is a landscape exposed to adverse weather.

Sensitivity to Change

- The expansive horizons and broad panoramas within this moorland landscape may be diminished by further features which break up the composition;
- The sense of isolation, extensive panoramas and impression of wildness could be compromised by the introduction of further buildings or other structures;
- The consistency of appearance of the moorland character could be damaged by variation in land management practices;
- The introduction of further woodland or forest development in areas of open moorland would break up the continuity of land cover and interrupt or obstruct views;
- Possible fragmentation and encroachment by unsympathetic forms of development which could disrupt the wide and uncluttered horizontal views.

Spey Valley Area AGLV

6.7.73 The Spey Valley AGLV is an extensive designation identified for its local landscape importance in the Moray Local Development Plan (MLDP) (2015) under *Policy E7 Areas of Great Landscape Value (AGLV) and impacts upon the wider landscape* and shown on the Proposals Map (Environment) of the MLDP. Guidance contained in the MLDP states:

6.7.74 *'In the case of wind energy proposals the assessment of landscape impact will be made with reference to the terms of the Moray Wind Energy Landscape Capacity Study* [MWELCS 2017]*…New developments should be designed to reflect the landscape characteristics and Special Qualities identified in the Landscape Character Assessment of the area in which they are proposed.' (p.42 Policy E7 MLDP)*

6.7.75 The Spey Valley AGLV includes the core valley of the River Spey from Fochabers to Aviemore and the containing uplands, mostly to the south which contribute to its shape and setting. The designation broadly covers the following Landscape Character Types as identified in MWELCS 2017:

- LCT7 Broad Farmed Valley
- LCT12a Open Uplands with Steep Slopes
- LCT12b Open Uplands with Settled Glens
- LCT13 Narrow Farmed Valley
- LCT9 Rolling Forested Hills

6.7.76 In addition, the southern part of the Moray Council Spey Valley AGLV lies within the CNP.

6.7.77 There are no specific citation documents linked to the Moray Council AGLVs. The key characteristics and development guidance contained in MWELCS 2017 for the individual LCTs listed above, together with the CNP LCA 2009 and The Special Landscape Qualities of the CNP (2010) are taken into account in the detailed assessment of potential effects on the Spey Valley AGLV.

Visual Baseline

6.7.78 The assessment of visual effects of the proposed development considers the effect on visual receptors or viewers throughout the study area. Visual receptors are people who will be affected by changes in views or visual amenity at different places. They are usually grouped by what they are doing at these places and include:

- people living and working in the area, such as residents and farm workers;
- people who view the proposed development sequentially such as those travelling through the area on road, rail or other forms of transport;
- people visiting promoted tourist attractions and landscapes; and
- people pursuing other recreational activities.

6.7.79 These visual receptors comprise the visual baseline.

Zone of Theoretical Visibility Mapping

6.7.80 Computer generated ZTV mapping has been undertaken to assist in determining the likely extent of visibility of the proposed development within the study area and the likely landscape and visual receptors affected by the proposed development. ZTVs have been prepared in accordance with the guidance included within *'Visual Representation of Wind Farms Good Practice Guidance'* Version 2.2 (SNH, 2017).

6.7.81 Analysis of the detailed ZTV Figures 6.1 identified areas where all parts of the development were visible (full visibility) and those areas from where not all proposed Paul's Hill II turbines were visible (partial visibility). This process also identified those areas where no visibility occurred, which allowed some receptors to be 'scoped out' of the various selected receptor lists, to be no longer considered for further assessment.

Selected Viewpoints

6.7.82 Analysis of Figure 6.1, together with site knowledge and verification were used to identify a provisional list of viewpoints which were investigated during scoping stage consultation with the Planning Authority and other stakeholders such as community groups and Scottish Natural Heritage. The scoping report identified a list of provisional selected viewpoints to be included in the finalised LVIA assessment and also a list of illustrative viewpoints to be 'Scoped out' of the detailed LVIA assessment (illustrative viewpoints are shown in Appendix 1.1: Scoping Report). Scoping consultation confirmed the list of provisional selected viewpoints which was taken forward as a finalised list. This finalised list of ten viewpoints has been chosen to represent the views experienced towards the proposed development throughout the study area by various groups of people or receptors. Section 6.3 details the iterative process of viewpoint selection.

6.7.83 The finalised list of selected viewpoints include a variety of different types of view. These are referred to as representative views, specific views and exemplifying viewsfrom publicly accessible locations, which are defined as:

- *Representative viewpoints:* selected to represent the experience of different types of visual receptors, where larger number of viewpoints cannot all be included individually and where the significant effects are unlikely to differ. For example, certain points may be chosen to represent the views of users of particular public footpaths and bridleways.
- *Specific viewpoints:* chosen because they are key views and sometimes promoted viewpoints within the landscape, including for example scenic viewpoints from roads, specific local visitor attractions, viewpoints in areas that are particular noteworthy for visual and/or recreational amenity, such as landscapes with statutory landscape designations, or viewpoints with particular cultural landscape associations.
- *Exemplifying viewpoints:* chosen specifically to demonstrate a particular effect or specific issue, which might be the restricted visibility at certain locations.

6.7.84 Viewpoints are selected to take account of the viewing experience (such as static views from settlements and sequential views from routes) cumulative views of other developments and as far as possible are representative of the range of key visual receptors and view types (including panoramas, vistas, glimpsed views), as well as being located at varying distances, elevations and orientations from the proposed development.

6.7.85 Although these selected viewpoints primarily represent visual receptors, their location within certain designated landscapes or particular character types illustrate potential changes in the experiences from these landscapes, giving an indication of potential landscape effects. The predicted views from the selected viewpoints may therefore be cited as examples of such landscape effects within the Landscape Impact Assessment.

6.7.86 The selected viewpoints are presented in the following Table 6.6.

Table 6.6: Selected Viewpoint list

VP No.	VP Name	Coordinate	Distance from PH2	Visual Receptors	Landscape Receptors
1	Tormore Distillery	315441 E 835091 N	5.9 km	A95 road travellers Distillery visitors/tourists Residents Speyside Way walkers	River Valleys LCT (MRN3)
2	Ben Aigan	330958 E 848130 N	18.1 km	Hill walkers	Rolling Forested Hills LCT (9); Spey Valley AGLV
3	Ben Rinnes	325461 E 835454 N	13.2 km	Hill walkers	Open Uplands with Steep Slopes LCT (12a); CNPA
4	Minor road, Knockando to Dallas, nr Aultnahuish	314362 E 849285 N	7.5 km	Minor road travellers	Upland Moorland and Forestry LCT (10)
5	Carn a Ghille Chearr summit, Hills of Cromdale	313969 E 829890 N	10.6 km	Hill walkers	Strath Avon: Lower Strath Avon (34); CNPA
6	Archiestown	322954 E 844034 N	9.3 km	Residents Minor road travellers	Broad Farmed Valley LCT (7)
7	Upper Knockando	318004 E 843106 N	4.3 km	Minor road travellers	Upland Moorland and Forest LCT (10)
8	Carn Diamh	318239 E 824943 N	16.4 km	Hill walkers	Strath Avon: Lower Strath Avon LCA (34); Strath Avon: Mid Strath Avon LCA (33); Glen Livet (35) LCA; CNPA
9	A95 between Aberlour and Ballindalloch	324624 E 840731 N	10.7 km	A95 road travellers Nearby residents	Broad Farmed Valley LCT (7)
10	A95 Memorial at Junction with B9008	318515 E 835428 N	7.5 km	A95 road travellers Nearby residents	Broad Farmed Valley LCT (7)

Residential Receptors

6.7.87 Residential receptors are divided into individual residential properties close to the proposed development and whole settlements within the study area.

Individual residential properties

6.7.88 There is currently no published guidance on the distance from the proposed development that should be adopted for a detailed study of visual amenity from residential properties. Precedent and experience suggests that a study area of between 2km and 3km radius from the nearest turbine is appropriate depending on the local landscape characteristics. This assessment considers a 3km study area to be appropriate, taking a precautionary stance as the Achany appeal decision 2008 stated *'significant impacts on the visual amenity of residential properties at the operational stage would be confined to within 3km of the site.'* This study area was agreed through scoping stage consultation.

6.7.89 Using OS and GIS data mapping, a total of 4 properties/property groups were identified within a 3km radius of the proposed Paul's Hill II turbines. Properties located within close proximity to each other and that are likely to experience a similar view of the proposed development were grouped for purposes of the study. These groups comprise the Corglass Farm group and Leakin Farm group both comprising several farm buildings.

6.7.90 Aerial photography was used to ascertain the access or approach to the property, the orientation of the property, the extent of its curtilage and the presence of vegetation and buildings around the property. A ZTV was then prepared and the properties plotted as shown in Figure 6.6. This would allow for any properties outwith the ZTV to be scoped out of the residential visual amenity assessment. All 4 properties were within the ZTV for Paul's Hill II Wind Farm development. Site survey was then carried out to verify these desktop studies and to ascertain whether all 4 properties were indeed inhabited. It was identified that the Upper Knockans property was not inhabited as shown in Photographic Figure 6.1 and therefore not considered further in this RVAA.

Photographic Figure 6.1: Illustrative Photograph of derelict condition of Upper Knockans property taken looking north westwards towards the property from along the Knockhourn Farm access road.

6.7.91 The following individual residential properties are assessed in detail in the RVAA in Section 6.9 within the Visual Impact assessment.

- Property 1 – Glenarder
- Property 2 – Corglass Farm Group
- Property 3 – Leakin Farm Group

Settlements

6.7.92 Settlement receptors throughout the study area were identified and defined in the Moray Local Development Plan (2015) and within the Highland Council and Cairngorm National Park Authority areas as Key Centres. Initial first stage assessment included desktop analysis of OS mapping and the ZTV (Figure 6.1) and was presented in section 13.7.3 of the scoping report. Site work and scoping stage consultation verified the selection of 4 settlements to be assessed in detail for potential effects, in the event of the addition of the proposed Paul's Hill II Wind Farm development. On site photographs were taken with a hand held camera for illustrative purposes only and on occasion inclement weather has necessitated the use of google streetview images in this report for illustrative purposes only. Where used, these are acknowledged in the text.

6.7.93 The distribution of settlements throughout the study area generally correlates to the key valleys and consequently the key transportation routes. The main northern towns of Nairn, Forres and Elgin link Inverness to Keith and the east coast. The tourist towns of Aviemore and Grantown are located toward the western edge of the Cairngorms National Park and accessed by the A95 main road route through the Spey Valley, along which are further smaller towns such as Aberlour. Within 10 km of the proposed development are numerous individual residential properties, farmsteads and hamlets/building groups and scattered small villages.

6.7.94 The four settlements identified by the initial assessment to have the potential to experience significant effects all lie within 10 km of the proposed development and comprise:

- Archiestown
- Upper Knockando
- Craigellachie
- Dallas

Sequential routes

6.7.95 The main transportation routes generally follow the broad Spey Valley and the narrow wooded valleys such as the Findhorn. The principal A9 route to the south-western edge of the study area follows the tops of the rolling uplands before descending to re-join the Spey Valley south of Grantown. Several 'A' roads connect the coastal towns to the Spey Valley A95 route and continue southwards through the Cairngorm National Park. Numerous 'B' Roads and minor roads cut across the coastal plain, the upland farmland and forested hills and the rolling uplands and forested moorlands to provide access to the larger villages and small hamlets and building groups.

6.7.96 As a viewer moves through the landscape along these linear routes, this can lead to a series of viewpoints and experiences which may include other developments in addition to the proposed development, together with ever changing views of the proposed development itself. These are known as sequential effects.

6.7.97 Analysis of the ZTV in Figure 6.1 and OS based mapping identified theoretical visibility from a number of sequential road and recreational routes within the study area. Initial first stage assessment was presented in section 13.7.4 of the scoping report and was carried out on road routes and long distance footpath and cycle routes throughout the study area and from Core Paths to a radius of 5km from the proposed development. Site work and scoping stage consultation verified the selection of 8 routes to be taken forward to be assessed in the LVIA for potential effects, in the event of the addition of the proposed Paul's Hill II Wind Farm development.

6.7.98 The following 8 routes were identified by the initial assessment and subsequent consultation with stakeholders to have the potential to experience significant effects, owing to the presence of long durations of visibility with some open views of the proposed development:

- A95 between Keith, Grantown-on-Spey and the A9;
- B9102 From Craigellachie, through Archiestown and extending to Cragganmore
- B970
- The Dallas to Knockando road
- Speyside Way including the section of the 'Moray Way' which follows the Speyside Way route from Craigellachie to Cromdale.
- Moray Core Path SW04
- Moray Core Path SP19
- Moray Core Path SP20

Cumulative Baseline

6.7.99 The Cumulative Landscape and Visual Impact Assessment (CLVIA) has been undertaken concurrently with the Landscape and Visual Impact Assessment (LVIA) and like the LVIA deals with cumulative effects on landscape and visual receptors separately. The aim of the CLVIA is to identify, predict and evaluate potential key effects arising from the addition of Paul's Hill II Wind Farm to a theoretical landscape baseline which includes cumulative developments currently present in the landscape and that may or may not be present in the landscape in the future. Cumulative developments consist of other wind farm developments only.

6.7.100 The difference between LVIA and CLVIA is the different baseline conditions in terms of other wind farm developments that are assumed to be present in the landscape. The LVIA baseline conditions consider the introduction of Paul's Hill II Wind Farm to a landscape with other operational wind farm developments and those under construction. The CLVIA baseline conditions consider the introduction of the proposed development to a landscape with other wind farm developments at more speculative stages of the planning system, such as:

- consented wind farms which have been granted planning consent but are not yet constructed; and
- submitted valid wind farm applications awaiting determination, including those at appeal.

6.7.101 For clarity, the cumulative assessment separates out these different speculative stages of development by identifying different *'cumulative baseline scenarios'.* The existing scenario of operational wind farms and those under construction is assessed in the LVIA and is referred to as scenario 1.

6.7.102 The CLVIA considers the following scenarios:

- Scenario 2 considers the addition of the proposed development in the context of operational wind farms, those under construction and additionally those developments currently consented. This represents the likely future scenario;
- Scenario 3 considers the addition of the proposed development in the context of operational, under construction, consented, undetermined planning applications and wind farm developments currently at appeal i.e. a less certain future scenario.

6.7.103 As detailed in section 6.3, scoping consultation agreed that a highly speculative fourth scenario, which would consider pre-application developments, would not be required to be assessed within the CLVIA.

6.7.104 The detailed cumulative assessment will comprise the assessment of the introduction of the proposed scheme into each scenario baseline. In the CLVIA, cumulative effects will be reported as the additional effects of the introduction of the proposed development, should other cumulative schemes be present in the different baseline scenarios, over and above the effects identified in the LVIA. For each receptor, it is clarified as to whether the effect has increased or decreased relative to the LVIA assessment or whether the effects will be the same as in the LVIA assessment.

6.7.105 An initial cumulative search area of 60km from the proposed scheme was delineated. The broad distribution of wind farm developments and their status within the planning system within 60km of the proposed development is illustrated in Figure 6.11 Cumulative Search Area map. This includes all typologies of wind turbine development above 50m to blade tip in height up to 5km from the proposed development, and all known wind farm developments consisting of more than 3 turbines and above 50m to blade tip in height up to 60km from the proposed development. These include all operational schemes, those schemes under construction, consented schemes, those schemes in the planning system as valid applications (including schemes at appeal) and those at the scoping stage within this search area. Recently withdrawn sites have not been included and those sites registered with a Pre-Application Notice (PAN), are not finalised applications and have therefore not been included as a valid application but have been included as a pre-application/scoping scheme.

6.7.106 This initial Search Area list was then refined during the first stage assessment process using initial cumulative desktop and site knowledge and verification to establish which wind farm developments were of most relevance to the cumulative assessment for the proposed development. Scoping consultation agreed a finalised list of these most relevant wind farm developments. This comprises the cumulative baseline (or Cumulative Study Area). As stated in the SNH guidance *'Assessing the Cumulative Effects of Onshore Wind Energy Developments,'* (SNH, 2012) *'the key principle for all cumulative impact assessments is to focus on the likely significant effects and in particular those which are likely to influence the outcome of the consenting process'.* (para 33 SNH 2012).

6.7.107 The cumulative baseline identifies those developments that the assessor considers require detailed cumulative assessment in the CLVIA. These include all operational, consented and valid planning applications within an approximate 20 km radius from the proposed site and are illustrated in Figure 6.10

6.7.108 This includes the existing developments of Paul's Hill and Berryburn located within the rolling uplands north of the broad Spey Valley. To the north and east, the landscape gives way to the broader topped forested moorland where the existing Rothes I and Rothes II developments are located, together with the consented Meikle Hill, Kellas and Hill of Glaschyle developments. West of Paul's Hill, the consented Cairn Duhie development is located within the Open Uplands LCT as identified in the Moray and Nairn Landscape Assessment (SNH, 1998) which forms a continuation of the Open Rolling Upland LCT containing the proposed development.

6.7.109 In addition, potential sequential cumulative visual effects have been identified relating to the A95 route. This extends the cumulative baseline eastwards beyond 20 km to include the wind farm developments of Hill of Towie I and the consented Hill of Towie II Extension located to the east north east of the proposed development and set within the Rolling forested hills LCT.

6.7.110 In addition, the potential cumulative effect from Ben Rinnes has extended the cumulative baseline south eastwards incorporating the developments located within the Open Uplands with Settled Glens LCT to include the operational development of Clashindarroch, the consented scheme of Dorenell and the Submitted/Proposed Dorenell Wind Farm Variation & Extension. This proposes a revised Dorenell scheme to that already consented, together with an extension for a total of 10 additional turbines with varying tip heights.

6.7.111 Developments within the Highland Council area, including Tom nan Clach (repowered), Moy and Farr Wind Farms lie beyond 20km to the south west of the proposed development and have been scoped out of the cumulative baseline as visibility of the proposed development is extremely limited to the south-west leading to a lack of receptors with combined visibility of these developments and the proposed development together. Equally the developments of Aultmore and Edintore which lie to the east of the site within the Moray Council area, are well separated from the proposed development and are located within Landscape Character Types with no association to the Open Rolling Uplands containing the proposed development.

6.7.112 The cumulative baseline is listed in Table 6.7 below and mapped in the Cumulative Baseline map, Figure 6.12. The wind farm developments identified in the Cumulative Baseline are constantly evolving and all information is

supplied to the best of our knowledge and up to date as of 9 February 2018. The continually evolving nature of the cumulative baseline requires a reasonable end date beyond which any further changes to the baseline would not need to be considered in the CLVIA. Through scoping consultation a 'cut-off' date of two months prior to the submission of the LVIA has been agreed as a reasonable timeframe.

Table 6.7: Cumulative Baseline Developments

Wind Farm Name	Development Stage	Turbine No.	Blade Tip Height (m)	LCT
Paul's Hill	Operational	28	100	CT11 Open Rolling Uplands
Berryburn	Operational	29	104	CT11 Open Rolling Uplands
Rothes I	Operational	22	100	CT10 Upland Moorland and Forestry
Rothes II	Operational	18	125	CT10 Upland Moorland and Forestry
Meikle Hill	Consented	6	126.5	CT10 Upland Moorland and Forestry
Kellas	Consented	4	110	CT10 Upland Moorland and Forestry
Hill of Glaschyle	Consented	12	99.5	CT10 Upland Moorland and Forestry
Cairn Duhie	Consented (At Appeal)	20	110	MRN4: Coastal Farmland
Dorenell I	Consented	59	126	12b Open Uplands with Settled Glens
Dorenell Variation (V) & Extension (E)	Submitted (Appeal Pending)	(V)14 (V)39 (E)1 (E)9	(V)125 (V)150 (E)125 (E)150	12b Open Uplands with Settled Glens
Hill of Towie I	Operational	21	100	CT9 Rolling Forested Hills
Hill of Towie II	Consented	16	125	CT9 Rolling Forested Hills
Clashindarroch	Operational	18	110	Area17: Moorland Plateaux

6.7.113 As in the methodology described in paragraph 6.7.102, the identified cumulative baseline is divided into 3 cumulative baseline scenarios as listed below. Scoping consultation confirmed pre application developments would not be included in the cumulative baselines:

6.7.114 ***Cumulative Baseline Scenario 1*** (Operational/Under Construction developments) consists of:

- Paul's Hill;
- Berryburn;
- Rothes I;
- Rothes II;
- Hill of Towie I;
- Clashindarroch.

6.7.115 ***Cumulative Baseline Scenario 2*** (scenario 1 and consented developments) consists of:

- Paul's Hill;
- Berryburn;
- Rothes I;
- Rothes II;
- Hill of Towie I;
- Clashindarroch;
- Meikle Hill;
- Kellas;
- Hill of Glaschyle;
- Dorenell. Hill of Towie II
- Cairn Duhie

6.7.116 ***Cumulative Baseline Scenario 3*** (scenario 1, 2 and submitted developments) consists of:

- Paul's Hill;
- Berryburn;
- Rothes I;
- Rothes II;
- Hill of Towie I;
- Clashindarroch;
- Meikle Hill;
- Kellas;
- Hill of Glaschyle;
- Hill of Towie II
- Cairn Duhie
- Dorenell Variation & Extension (replacing Dorenell);
- ;

6.7.117 Potential effects on landscape and visual receptors are assessed for each cumulative baseline scenario separately.

6.8 LANDSCAPE IMPACT ASSESSMENT

6.8.1 The aim of the Landscape Impact Assessment (LIA) is to identify, predict and evaluate potential key effects arising from the addition of the proposed Paul's Hill II Wind Farm development on the landscape as an environmental resource in its own right. Landscape effects may be caused by changes to the constituent features or elements of the landscape, its aesthetic or perceptual qualities and overall character. Landscape effects on designated landscapes are also considered in this assessment. This involves the assessment of changes to the landscape features and characteristics of the designation including the special qualities, which determine its reason for designation.

6.8.2 Assessing the significance of landscape effects requires the identification of the landscape receptors, the consideration of the nature of the landscape receptors (sensitivity) and the nature of the effect (magnitude) which would be experienced by each landscape receptor as a result of the proposed development. The methodology for the landscape assessment is detailed in Appendix 6-1, including the method of identifying the susceptibility of

landscape receptors. The lower the susceptibility, the greater the ability of the landscape character area/landscape designation to accommodate the proposed development without undue adverse effects.

6.8.3 A Cumulative Landscape Impact Assessment (CLIA) is also included in the following LIA and considers the level of effect as a result of the addition of the proposed development into each cumulative baseline scenario separately. The baseline scenarios are described in section 6.7.114.

6.8.4 Section 6.7 details the landscape receptors that have been identified and taken forward to be assessed in the LIA and CLIA below.

Effect on Landscape Fabric and character of the Proposed Development Area

6.8.5 The proposed development area for the proposed Paul's Hill II Wind Farm is identified in Figure 1.3. The proposed development area is located within the Open Rolling Uplands Landscape Character Type (LCT11) as identified in the MWELCS 2017. Its landscape characteristics and features are described in section 6.7. The development area is adjacent to and is part of the access route to the operational wind farm development of Paul's Hill.

6.8.6 At site level the sensitivity of the proposed development area refines the overall sensitivity for the host LCT11: Open Rolling Uplands.

6.8.7 The Landscape value is considered to be low as the proposed development area is not covered by any valued landscape designation but still exhibits medium level scenic qualities and is in a relatively good condition. It is the only example of its type within Morayshire, with typical features true to its type. The development area is part of an operational wind farm development and the presence of operational turbines and associated infrastructure including transmission lines reduce any perceptual qualities of naturalness and wildness. There is a general lack of regular public access owing to its status as an operational wind farm and as a result its recreational and cultural values are low.

6.8.8 The Landscape Susceptibility is considered to be Low as the proposed development area is large in scale and geographical extent with an open character, simple pattern and land cover and gentle landform. It is strongly inter-visible with neighbouring character areas with strong developed skylines owing to operational developments within close proximity and its perceptual qualities are low owing to the presence of built infrastructure namely operational wind farms. It is considered that the landscape characteristics of this LCT have the ability to accommodate most elements of the development without undue adverse effects.

6.8.9 This results in an overall sensitivity considered to be **Low** for the proposed development site area.

6.8.10 The construction and decommissioning stages of the proposed Paul's Hill II Wind Farm would result in ground disturbance operations, track upgrades and new track/crane pad/hardstanding construction and decommissioning removal, construction of wind turbines and removal during decommissioning and general reinstatement works, together with vehicular/personnel movements on site. Such operations would result in direct effects on the landscape fabric of the development site area. This will include ground vegetation and soil removal and the introduction of new elements into the moorland context. It is considered the magnitude of change on the landscape resource of the site would be **Moderate**, resulting from a large geographical extent and major size and scale of proposed changes but for a short period of time. This results in a ***Minor*** and ***Not significant*** effect on the landscape resource of the proposed development area during the construction and decommissioning stages of the proposed development. The Minor effect results from the low sensitivity of the development area, being located adjacent to an operational wind farm site, and the short term nature of the proposed construction and decommissioning effects.

6.8.11 Following reinstatement post construction, the site area would enter the operational stage. The magnitude of change on the landscape resource of the site would remain ***Moderate***, resulting from the large geographical extent of the site area affected, the minor size and scale of proposed changes including the introduction of 7 vertical elements into the moorland and the long term, theoretical reversible nature of the changes. This is considered to result in a ***Minor*** and Not significant effect on the proposed development area during the operational stage of the proposed development. The Minor effect results from the low sensitivity of the development area, being located adjacent to an operational wind farm site.

Effect on Landscape Character

6.8.12 The 11 LCTs that were identified with the potential to experience significant landscape effects as a result of the addition of the proposed development are fully assessed in the following LCT Tables 6.8 – 6.18. The determination of the value and susceptibility and therefore overall sensitivity of each landscape receptor is detailed in these tables as part of the LIA assessment. The overall sensitivity of each landscape character receptor in the MWELCS has been considered but it should be noted that this sensitivity is a generic guidance only and considers the sensitivity of the receptor to proposed wind farm development being located within that receptor. This is of course only of relevance to the Open Rolling Upland LCT11.

6.8.13 Equally the criteria for assessing the magnitude of the proposed change and consequent level of landscape effects are contained in the following tables.

6.8.14 As stated in paragraph 6.4.5, potential effects of the Construction and Decommissioning phases would include temporary effects on the landscape fabric of the proposed development area and temporary effects on the landscape character and visual amenity of the immediate area. The potential effects of the Construction and Decommissioning Phases have therefore been assessed for the proposed development area and the Landscape Character Type containing the proposed development; LCT11 Open Rolling Uplands.

6.8.15 All other assessments of effects on Landscape Character Types and Areas consider potential effects of the operational phase of the proposed development.

Table 6.8: Open Rolling Upland LCT (11)

Open Rolling Upland LCT (11)
Location
The proposed Paul's Hill II Wind Farm is located toward the south-eastern edge of this LCT. LCT11 lies to the north of the River Spey, partly enclosing this valley in the Ballindalloch area, and represents one of the southern-most Upland LCT within the Moray Council administrative area.
Sensitivity
Landscape Value: ***Medium***. This LCT is not covered by any valued landscape designation but still exhibits medium level scenic qualities and is in a relatively good condition. It is the only example of its type within Morayshire, with typical features true to its type. The presence of operational wind farm development and transmission lines reduce the perceptual qualities of naturalness and wildness and a medium level of recreational and cultural value and conservation interests is considered. *Landscape Susceptibility:* ***Medium***. This LCT is large in scale and geographical extent with an open character, simple pattern and land cover and gentle landform. It is strongly inter-visible with neighbouring character areas with strong mixed developed/undeveloped skylines owing to operational developments and its perceptual qualities are reduced owing to the presence of build infrastructure namely operational wind farms. It is considered that the landscape characteristics of this LCT have some ability to accommodate certain elements of the development without undue adverse effects. *Overall Landscape Sensitivity:* ***Medium*** sensitivity
Existing characteristics and experience (including cumulative baseline 1)
This is an extensive landscape with large central areas being relatively inaccessible due to its sparse population and larger tracts of shallow basins and flat mosses. Visibility of the existing Paul's Hill I Wind Farm generally extends out to 2 km from this development with the Berryburn development located to the west, extending this visibility of wind farm development to cover most of the core upland area of this LCT east of the A940. Scattered visibility of Paul's Hill development occurs to western higher ground around Knock of

Open Rolling Upland LCT (11)

Braemory and other smaller hills visually enclosing the A940 but is seen in addition to the substantial visibility of the Berryburn development.

Predicted experience of proposed development (including cumulative baseline 1)

The existing visibility of operational wind farm developments within this LCT would barely be extended by the proposed Paul's Hill II Wind Farm. This can be seen in Figure 6.11a. Additional new visibility of the wind farm development where there was previously no visibility of operational developments includes a small area of partial visibility of up to 3 turbine nacelles from the north-eastern lower slopes of Roy's Hill and includes the Corglass Farm property and partial visibility of up to 3 nacelles from the southern lower slopes of Roy's Hill and western lower slopes of Lady's Hill to the south of the site and the LCT. The string of summits including Carn Kitty and Carn Ghiubhais prevent any visibility of the proposed development further west within this LCT than these summits. The distinctive features of Moidach More, Knock of Braemory summit and setting will not experience any change from the proposed development.

Theoretical visibility of the proposed Paul's Hill II Wind Farm is restricted to within 2 km of the proposed development but this varies between visibility of all 7 nacelles, mainly from the higher ground to the north-west around Carn Shalag, to partial visibility of between 1-6 turbine nacelles owing to the gently rolling landform west of Roy's Hill. Scattered areas of theoretical visibility ranging from 4-7 nacelles occur up to 5 km from the proposed development from the summit of Carn Kitty and from the higher plateau around Loch of the Cowlatt on the edge of the forested Glen Lossie. The furthest visibility within this LCT occurs less than 7 km from the proposed development from the eastern slopes of Carn Ghiubhais which lies within close proximity to the operational development of Berryburn. The operational developments of Hill of Towie I, Rothes I and Rothes II are also visible from the north-eastern edge of this LCT, overlapping slightly with visibility of Berryburn and Paul's Hill and then continuing visibility of operational developments north-eastwards.

The change in experience of wind farm development as a result of the addition of the Paul's Hill II Wind Farm will therefore be very limited in the additional extent of visibility. In landscape terms, the key landscape features of Moidach More and Knock of Braemory summit and setting will remain unaffected. Wind farm development would move nearer to the summit of Roy's Hill,but the proposed turbines remain to the west and north-west and do not encircle Roy's Hill, retaining many views of this landmark hill with no development visible 'behind' the summit (as experienced from the Spey Valley to the south). This was a key aim of the layout design. Overall, the proposed developments fits well with the existing wind farm pattern of Berryburn and the original Paul's Hill, providing a modest eastern extension to this wind farm cluster.

Predicted cumulative experience of proposed development with cumulative baseline scenarios 2 & 3

As demonstrated by Cumulative ZTVs Figures 6.11a-k, scenario 2 consented wind farm developments of Meikle Hill, Kellas, Dorenell and Hill of Towie II would be visible overlapping the visibility of the existing Rothes I and II developments mainly covering the north-eastern edge of the LCT and the visibility of the consented development of Hill of Glaschyle would cover most of the western and central core upland area of this LCT. The Cairn Duhie development located just on the western boundary of the LCT would extend visibility of wind farm development to affect most of the western part of the LCT west of the Berryburn development, including the core of Moidach More and Knock of Braemory. Visibility of the proposed Paul's Hill II Wind Farm would not overlap with potential visibility of the consented Cairn Duhie development The proposed Paul's Hill II Wind Farm would not extend any further visibility in addition to that experienced as a result of scenario 2 developments but would result in some localised moderate magnitude of landscape change around Roy's Hill.

The scenario 3 proposed Dorenell Variation would extend visibility of wind farm development east of Roy's Hill and the Paul's Hill II Wind Farm would not add any further visibility in addition to that experienced as a result of scenario 3 Dorenell Variation and Extension developments.

Magnitude of Landscape Change during construction and decommissioning stages

Open Rolling Upland LCT (11)

Geographical Extent: ***Medium.*** It is considered the vehicular movements from delivery and construction vehicles, together with crane movements will affect a medium extent of this LCT.

Size and Scale: ***Major***. Although adjacent to an operational development, construction operations including ground disturbance and vehicular/personnel movements are considered to result in a major change to the size and scale of operations in the locality for a temporary period of time.

Duration and Reversibility: ***Short*** term to be reinstated to operational site condition.

Overall Magnitude of landscape change: ***Moderate.*** Magnitude of landscape change causing a partial alteration to the landscape character over a medium area resulting in a noticeable change in the immediate setting of the proposed development within this LCT with Cairn Kitty providing screening of construction operational further west in this LCT. Potential for a noticeable change in the experience of this setting from outwith the LCT, mainly from the neighbouring LCT to the south, the Broad Farmed Valley LCT7 of the Spey Valley, although Roy's Hill screens most lower lying elements of the construction site from these more sensitive receptors.

Magnitude of Landscape Change during operational stage

Geographical Extent: ***Small.*** The landscape change around Roy's Hill is highly localised and considered small in extent.

Size and Scale: ***Moderate***. Owing to the presence of operational developments, perceptual aspects of landscape character will not be substantially affected by the presence of the proposed wind farm development. A moderate change is considered to occur around the landscape feature of Roy's Hill only with the remaining landscape character type and associated landscape features remaining unaffected.

Duration and Reversibility: ***Long*** term theoretically ***reversible*** change

Overall Magnitude of landscape change: ***Moderate.*** Magnitude of landscape change causing a partial alteration to one key feature of the landscape character over a small area resulting in a noticeable change in the immediate setting of the proposed development within this LCT and a noticeable change in the experience of this setting from outwith the LCT, mainly from the neighbouring LCT to the south, the Broad Farmed Valley LCT7 of the Spey Valley. The proposed development does comply with a number of MWELCS guidance points including the proposed turbines being located to avoid the smaller scale more complex landform and lochans lying to the north of Carn Kitty and the avoidance of significant cumulative effects experienced from the Dava Way.

Magnitude of Cumulative Landscape Change during operational stage

Moderate Magnitude of Cumulative Change in respect of the existing/consented developments (scenario 1). Reduces to ***Slight*** for scenario 2 owing to the greater extent of landscape effect of the Cairn Duhie development affecting the most sensitive features of this LCT which would remain unaffected by the presence of the proposed Paul's Hill II Wind Farm. Remains ***Slight*** for scenario 3.

Landscape Effect during construction and decommissioning stages

Moderate and ***significant***. Considered a significant overall landscape effect owing to the extent of operations and vehicular movements to and from the site within the LCT. Following reinstatement post construction landscape effect on LCT11 is predicted to be ***Moderate*** and ***Not significant*** as detailed below. Following reinstatement post decommissioning the proposed development area will be returned to open moorland with no residual landscape effects predicted.

Landscape Effect during operational stage

Moderate and ***not significant.*** Considered a not significant overall landscape effect owing to the localised nature of the change which is considered to be nearer the borderline minor/moderate magnitude level of change.

Cumulative Landscape Effect during operational stage

Open Rolling Upland LCT (11)
Moderate and ***not significant*** for scenario 1 developments. Cumulative landscape effect reduces to ***Minor/Moderate*** for scenario 2 and remains ***Minor/Moderate*** for scenario 3.

Table 6.9: Broad Farmed Valley LCT (7)

Broad Farmed Valley LCT (7)
Location
This LCT is located 2.4 at its nearest point to the south east of the proposed Paul's Hill II Wind Farm and includes the broad valley bottom of the River Spey and the lower slopes of the adjacent upland landscapes including LCT10 and LCT11.
Sensitivity
Landscape Value: ***High***. This LCT is covered by the local Moray Council landscape AGLV, exhibiting medium level scenic qualities and is in a good condition being a well settled and managed landscape. It is the only example of its type within Morayshire, with typical features true to its type. It has a strong sense of place associated with the production of whisky with high levels of perceptual and cultural qualities together with a high level of recreational value. *Landscape Susceptibility:* ***Medium***. This LCT is medium in scale and large in geographical extent with moderate enclosure, a mixed informal pattern and gentle landform. It is moderately inter-visible with neighbouring character areas mainly with the strong mixed developed/undeveloped skylines owing to operational developments of the surrounding uplands but its perceptual qualities are reduced owing to the presence of mixed settlement and industrial infrastructure generally associated with the whisky industry. It is considered that the landscape characteristics of this LCT have some ability to accommodate certain elements of the development without undue adverse effects. *Overall Landscape Sensitivity:* ***Medium*** sensitivity
Existing characteristics and experience (including cumulative baseline 1)
This is an extensive LCT stretching 30 km from Inchberry in the north to Cragganmore in the south. Visibility of operational wind farm developments of Paul's Hill, Rothes I and II and Berryburn generally occurs across the south-western end of this LCT from the rising slopes of the eastern bank of the River Spey and the broader, more open valley bottom up to 17 km from the proposed development. Visibility of the operational Hill of Towie I development extends visibility of wind farm development eastwards along the valley to include both sides of the River around Aberlour and outer areas of Craigellachie. Although a broad valley, the strongly contained sides of the valley and distinctive enclosing summits of Ben Rinnes, Meikle Conval and Little Conval, Ben Aigan, Paul's Hill and Roy's Hill form a distinctive skyline with some limited development beyond Roy's Hill.
Predicted experience of proposed development (including cumulative baseline 1)
Theoretical visibility of the proposed development is generally limited to varying partial visibility of between 1-6 turbine nacelles from the south-western end of the LCT, overlapping with existing visibility of operational wind farm developments. Some additional wind farm visibility would occur where it did not before as a result of the presence of the proposed Paul's Hill II Wind Farm, and is focused around small, central areas of the floodplain. As shown in sample viewpoints VP6 Archiestown Figure 6.13f and VP9 A95 Between Aberlour and Ballindalloch Figure 6.13j, wind farm development is brought closer to Roy's Hill and can be seen in these valley views as extending beyond the enclosed and screened area 'behind' Roy's Hill. The role of Roy's Hill in forming a visual screen and physical stop to operational wind farm development within the neighbouring uplands is therefore slightly altered by the presence of the proposed development as are the relatively undeveloped skylines which would exhibit a more consolidated view of wind farm development.
Predicted Cumulative experience of proposed development with cumulative baseline scenarios 2 & 3
As demonstrated by Cumulative ZTVs Figures 6.11a-k, scenario 2 consented wind farm developments of Meikle Hill, Kellas, Dorenell and Hill of Towie II would be visible overlapping the visibility of the operational developments covering the south-western end of the LCT. Any additional extension of visibility of the proposed Paul's Hill II Wind Farm in areas where there were previously no visibility of wind farm development is barely perceptible but as the proposed wind farm development represents the closest of the operational developments to this LCT, the level of magnitude of landscape change particularly on the relatively undeveloped skyline results in a noticeable change in its own right rather than as a cumulative change. The scenario 3 proposed Dorenell Variation and Extension are associated with upland landscapes well separated from the Spey Valley with very little cumulative change resulting from the addition of Paul's Hill II Wind Farm to scenario 3 developments.
Magnitude of Landscape Change
Geographical Extent: ***Medium*****.** Considered to affect a reasonable portion of the LCT although the landscape change around Roy's Hill is considered to be highly localised. *Size and Scale:* ***Moderate***. Highly valued cultural and perceptual aspects of the landscape character will not be substantially affected by the presence of the proposed wind farm development as these strong associations with the whisky industry are focused around the river channel and valley bottom rather than the enclosing uplands where the proposed development is located. A moderate change is considered to occur as a result of the altered skyline around the landscape feature of Roy's Hill. *Duration and Reversibility:* ***Long*** term theoretically ***reversible*** change *Overall Magnitude of landscape change:* ***Moderate*****.** Magnitude of landscape change causing a partial alteration to the relatively undeveloped skyline of the LCT with an overall moderate geographical extent of the LCT affected, resulting in a noticeable change from large areas of this neighbouring LCT.
Magnitude of Cumulative Landscape Change
Moderate Magnitude of Cumulative Change in respect of the existing/consented developments (scenario 1). Remains ***Moderate*** for scenario 2 because of continued alteration to skyline. No additional cumulative change for scenario 3, remaining moderate owing to the landscape separation and less association of LCT7 with those LCTs containing scenario 3 developments.
Landscape Effect
Moderate/Major and ***Significant*****.** Considered a significant overall landscape effect owing to the large areas of valley bottom affected and the noticeable landscape change of the skyline, a key feature of this LCT. However, operational developments will generally be experienced at the same time as the proposed development and the landmark feature of Roy's Hill is not the only key landmark hill enclosing the LCT. All other distinctive hills enclosing LCT7 remain unaffected by the proposed development. These mitigating factors lead to the conclusion that this significant effect is an acceptable and localised significant effect.
Cumulative Landscape Effect
Moderate and ***Significant*** for scenario 1 developments. Cumulative landscape effect remains ***moderate*** for scenarios 2 and 3.

Table 6.10 Upland Moorland and Forestry LCT (10)

Upland Moorland and Forestry LCT (10)
Location
This LCT is located 2.8 km at its nearest point to the north and north east of the proposed Paul's Hill II Wind Farm and merges with LCT11 to the south-west. LCT10 consists of the forested moorland plateau between the Spey Valley and the transitional rolling farmland around Dallas and Kellas.
Sensitivity
Landscape Value: ***Low***. This LCT is generally not covered by the local Moray Council landscape AGLV, with only a small north-western part of this LCT around Dallas falling within the wider AGLV. This appears more of an arbitrary boundary rather than any scenic value of the part of this LCT. The presence of extensive forestry and the operational Rothes I and II Wind Farm developments reduce the perceptual and cultural value to low and conservation/recreational value to medium. It is considered to be in average condition and of medium scenic quality. It is the only example of its type within Morayshire, with typical features true to its type. *Landscape Susceptibility:* ***Low***. This LCT is large in scale and geographical extent and is an open landscape with a simple landscape and land cover pattern and gentle landform. It has outward views and forms strong mixed developed and undeveloped skylines owing to operational developments. Its perceptual qualities are reduced, owing to the presence of forestry and operational wind farm development It is considered that the Landscape characteristics are able to accommodate certain elements of the development without undue adverse effects *Overall Landscape Sensitivity:* ***Low*** sensitivity
Existing characteristics and experience (including cumulative baseline 1)
This is an extensive LCT stretching 28 km from the A940 near the Dava Way in the west to beyond the Glen of Rothes in the east. Inchberry in the north to Cragganmore in the south. Visibility of operational wind farm developments of Paul's Hill I, Rothes I and II, Berryburn Hill of Towie I and Clashindarroch cover most of the land area of this LCT, with Berryburn visibility covering the western end of this LCT and visibility of the Rothes I and II developments extending this influence of wind farm development to the eastern end of the plateau around Glen Latterach. The general experience from within the LCT is limited to the Knockando to Dallas unclassified road where the landscape is seen as an open, uniform landscape with large tracts of enclosed dense forestry with glimpses of operational turbine developments in neighbouring LCTs and close proximity views of operational development at Rothes close to the viewer. Experience of LCT10 is most prominent from northern LCTs such as the coastal plain, LCT4 from where the upland plateau is seen as a long even ridgeline with operational developments forming an even line on top of this unremarkable skyline.
Predicted experience of proposed development (including cumulative baseline 1)
Theoretical visibility of the proposed development is generally limited to visibility from the higher ground to the west of the Rothes developments and high points from the unclassified Dallas to Knockando road pass. Scattered visibility occurs from western high points amidst the plateau such as the forested summits overlooking Glen Lossie and the distinctive landmark Hill of Mill Buie. No additional areas of visibility occur of the proposed development, where it did not before and the proposed turbines would always be viewed as an extension and in the context of the operational Paul's Hill turbines. As shown in sample viewpoint VP4, Figure 6.13d from the minor road pass near the property of Aultnahuish, within LCT10, the proposed turbines are theoretically seen extending the operational line of Paul's Hill turbines, bringing them closer to the viewer. However, in reality existing forestry obscures part of the operational Paul's Hill development but allows glimpsed views from the moving road route of the proposed turbine nacelles and tips with operational turbines of Paul's Hill and Berryburn visible further along the ridgeline. From neighbouring LCTs particularly the coastal

Upland Moorland and Forestry LCT (10)
lowlands to the north, the proposed turbines are seen on a separate landform to the even ridgeline of the forested plateau of LCT10 and this strong skyline remains the prominent feature.
Predicted cumulative experience of proposed development with cumulative baseline scenarios 2 & 3
As demonstrated by Cumulative ZTVs Figures 6.11a-k, scenario 2 consented wind farm developments of Meikle Hill, Kellas, Dorenell and Hill of Towie II would be visible throughout the eastern end of the LCT, overlapping the visibility of the operational developments which covers most of the LCT. As outlined above, the theoretical visibility of Paul's Hill II Wind Farm does not create additional areas of visibility where there was no visibility before but rather fits with the current visibility of operational developments and scenario 2 developments. Meikle Hill in particular will introduce turbines close to the visual receptors within this LCT as it is located in close proximity to the road pass from Knockando to Dallas. Meikle Hill becomes a prominent new landscape feature in the LCT. This, together with forestry screening and the distance from which the proposed Paul's Hill II Wind Farm would be experienced within this LCT further mitigate effects as a result of the proposed development. The scenario 3 proposed Dorenell Variation and Extension developments are associated with upland landscapes well separated from LCT10. Additional areas of visibility occur as a result of scenario 3 developments particularly in the western and southern edges of the LCT. The additional visibility which occurs as a result of Paul's Hill II Wind Farm overlaps with the operational and scenario 2 developments already with very little cumulative change resulting from scenario 3.
Magnitude of Landscape Change
Geographical Extent: ***Small*****.** It is considered a small coverage of theoretical visibility can be experienced from within this LCT, mainly concentrated around the minor road pass between the Spey Valley and the settlement of Dallas passing through the core uplands of this LCT. Other operational wind farm developments, mainly Paul's Hill, Berryburn and in successive views, Rothes I and II would always be experienced at the same time as the proposed turbines with no new landscape features being affected as a result of the proposed development. *Size and Scale:* ***Moderate***. It is considered that very few landscape features would be affected by the proposed wind farm development and perceptual elements are considered to be of low value and susceptibility owing to the strong presence of wind farm infrastructure in the existing landscape. A moderate scale change is considered to occur in terms of the relationship of the proposed turbines with the operational developments. This is due to the noticeable difference in turbine size of the proposed development turbines which is experienced throughout the areas of visibility. However, overall it is considered the proposed development fits with the overall line of operational Paul's Hill and Berryburn developments as experienced from within LCT10. *Duration and Reversibility:* ***Long*** term theoretically ***reversible*** change *Overall Magnitude of landscape change:* ***Moderate*****.** Magnitude of landscape change causing a partial alteration to the partly developed skylines as experienced from within the LCT10, largely due to the difference in size of proposed turbines to operational turbines of Paul's Hill and Berryburn.
Magnitude of Cumulative Landscape Change
Moderate Magnitude of Cumulative Change in respect of the existing/consented developments (scenario 1). Reduces to ***Slight*** for scenario 2 because of the prominence of Meikle Hill within this LCT which introduces a dominant new feature into the LCT detracting from outward views toward LCT11 and the proposed Paul's Hill II Wind Farm. No additional cumulative change for scenario 3, remaining ***Slight*** owing to the landscape separation of scenario 3 developments from this LCT and proposed development and continued prominence of Meikle Hill.

Upland Moorland and Forestry LCT (10)
Landscape Effect
Minor and ***Not significant.*** The low sensitivity of this LCT to the type of wind farm development proposed and small extent of LCT affected result in a minor level of overall landscape effect across the LCT as a whole.
Cumulative Landscape Effect
Minor and **Not *significant*** for scenario 1 developments. Cumulative landscape effect reduces to ***Negligible/Minor*** for scenario 2 and 3.

Table 6.11: Open Upland with Steep Slopes LCT (12a)

Open Upland with Steep Slopes LCT (12a)
Location
Two areas of this LCT sub-Type to the Open Uplands and Farmed Valley LCT12 that occur in the south-eastern part of Moray, close to the CNP and Aberdeenshire boundaries. This LCT is located 8.4 km at its nearest point to the south-east of the proposed Paul's Hill II Wind Farm.
Sensitivity
Landscape Value: ***High***. This LCT is covered by the local Moray Council Spey Valley landscape AGLV designation, exhibits high level scenic qualities and is in a good condition. It is a unique LCT being identified as a sub-type of its own and is true to its type. The perceptual qualities of naturalness and wildness remain high despite the presence of the well settled valleys such as the Spey and the fine views obtained from the iconic summits of Ben Rinnes, Meikle Conval and Little Conval, together with the proximity of the CNP have determined a high level of recreational value. *Landscape Susceptibility:* ***Medium***. This LCT is large in scale and geographical extent with a moderately open character, simple pattern and land cover and a variable and distinctive landform particularly when viewed from the Spey Valley to the north, where the rolling profile of Meikle Conval, Little Conval and Ben Rinnes is most striking. It is strongly inter-visible with neighbouring character areas with strong relatively undeveloped skylines and retains high perceptual qualities due to the long views possible across the CNP and neighbouring valley landscapes. It is considered that the landscape characteristics of this LCT including its large scale nature and moderate enclosure have some ability to accommodate certain elements of the development without undue adverse effects. *Overall Landscape Sensitivity:* ***Medium*** sensitivity
Existing characteristics and experience (including cumulative baseline 1)
This is a large scale landscape with steep sided slopes leading to narrow ridgelines which rise directly from the adjacent valleys. The rugged group of outlying Landmark Hills of Ben Rinnes, Meikle Conval and Little Conval are widely visible and form key landscape features within this LCT. Visibility of the existing Paul's Hill I Wind Farm generally extends across the west facing side slopes out to 20 km from this development with visibility of the Berryburn development barely extending the footprint of Paul's Hill visibility. Visibility of the Rothes developments extends visibility of operational developments to the central parts of this LCT with visibility of Clashindarroch, located 6 km from the eastern edge of this LCT, occurring as widespread patches of scattered visibility from ridgelines and eastern facing slopes. Visibility of Hill of Towie I Wind Farm overlaps considerably with the visibility of other operational developments within the western area of this LCT but introduces substantial new areas of visibility from the north-eastern end of the eastern area of LCT12a and even from the visually enclosed Glen Rinnes due to the orientation of this valley, aligned with the Hill of Towie IWind Farm. Ben Rinnes provides a key vantage point across the neighbouring valleys of the Spey and Glen Rinnes and fine distant views southward across the CNP. LCT11 containing the proposed development appears as a series of rolling hills and ridges with scattered forestry on the other side of the Spey Valley. It is

Open Upland with Steep Slopes LCT (12a)
considered that the views across the south-east and south west in the opposite direction from the proposed development and which take in the CNP and the juxtaposition of the Glens and uplands, contribute more to the scenic value of the overall panoramic view from Ben Rinnes than the northern views do, in the direction of the proposed development.
Predicted experience of proposed development (including cumulative baseline 1)
The existing extent of visibility of operational wind farm developments within this LCT would not be extended by the proposed Paul's Hill II Wind Farm. This can be seen in Figure 6.11a. The sample VP3 Ben Rinnes, Figure 6.14c, does show the change in view with turbines appearing around Roy's Hill and moving closer to the viewer, appearing larger in size to the operational Paul's Hill and Berryburn turbines, which they are. The proposed turbines also increase the depth of the overall Paul's Hill development and extends the horizontal spread, producing an extended development focussed behind the landform of Roy's Hill. However, from this elevated viewpoint, the prominence of Roy's Hill as an elevated feature is substantially reduced as it blends into the rolling uplands on the other side of the Spey Valley from the viewer. From this perspective, the Paul's Hill extended development therefore appears to settle well within these uplands and is entirely backclothed against the retreating landform. Overall, the openness of the view is retained and southern key views remain unaffected.
Predicted cumulative experience of proposed development with cumulative baseline scenarios 2 & 3
As demonstrated by Cumulative ZTVs Figures 6.11a-k, the visibility of scenario 2 consented wind farm developments of Meikle Hill, Kellas, and Hill of Glaschyle within this LCT largely overlap with the operational development of Paul's Hill as does the visibility of the proposed Paul's Hill II Wind Farm. Hill of Towie II overlaps largely with Hill of Towie I operational wind farm visibility but visibility of the extensive Dorenell consented development would extend operational wind farm visibility to the eastern slopes of this LCT and as seen in Figure 6.13c, the Dorenell development would be highly visible on the adjacent ridgeline from the key vantage point of Ben Rinnes across the intervening valley of Glen Rinnes. Dorenell would become a new prominent feature in many views from LCT12a. The consented Cairn Duhie development is associated with an upland landscape that is well separated from LCT12a with very little additional affect. The scenario 3 proposed Dorenell Variation and Extension would further increase the visible spread and density of operational turbines increasing the prominence of this new landscape feature. There is no additional visibility as a result of Paul's Hill II Wind Farm to that which already occurs as a result of operational, scenario 1 developments. Some limited changes to the composition of such views would occur as detailed above but it is considered key characteristics of the LCT remain largely unaffected. Scenario 2 and 3 developments introduce prominent features in close proximity to LCT12a resulting in further mitigation of landscape change as a result of the introduction of Paul's Hill II Wind Farm.
Magnitude of Landscape Change
Geographical Extent: ***Small.*** It is considered a small area of the overall LCT is affected. *Size and Scale:* ***Minor***. The difference in proposed turbine size to those of the operational turbines of Paul's Hill and Berryburn is evident from the areas of visibility of the proposed development highlighting the difference in the relationship between the operational and proposed turbines. This is considered a minor level of this element of magnitude as it is not considered the northern views are as integral to the scenic value of this LCT as are views across the CNP and to the south and east. Equally the key perceptual qualities are not considered to be strongly affected. *Duration and Reversibility:* ***Long*** term theoretically ***reversible*** change *Overall Magnitude of landscape change:* ***Slight.*** Magnitude of landscape change causing a minor alteration to northern backclothed views from Ben Rinnes and western slopes. The underlying character of LCT12a would remain unaffected with perceptual and recreational value remaining high and key inter-visibility with southern landscapes and neighbouring Glens remaining unaffected.

Open Upland with Steep Slopes LCT (12a)
Magnitude of Cumulative Landscape Change
Slight magnitude of Cumulative Change in respect of the existing/consented developments (scenario 1). Reduces to ***Negligible*** for scenario 2 owing to the introduction of the prominent new feature of Dorenell on the adjacent ridge to LCT12a which mitigates change resulting from the introduction of Paul's Hill II Wind Farm. Remains as ***Negligible*** for scenario 3.
Landscape Effect
Moderate and ***not significant.*** Considered a not significant overall landscape effect owing to the localised nature of the change and key characteristics and features of this LCT remain largely unaffected.
Cumulative Landscape Effect
Moderate and ***Not significant*** for scenario 1 developments. Cumulative landscape effect remains ***Moderate*** and ***Not significant*** for scenario 2 and scenario 3 as the high value and medium susceptibility of this LCT to wind farm development retains a moderate effect despite the mitigating factor of the prominent Dorenell developments.

Table 6.12: Coastal Farmland LCT (4)

Coastal Farmland LCT (4)
Location
An extensive low-lying plain spanning east to west across Moray, in a broad band of land backing the coastal Margin landscapes LCTs1-3 which lie to the north. LCT4 is located 16.6 km to the north of the proposed Paul's Hill II Wind Farm.
Sensitivity
Landscape Value: ***Medium***. Small northern parts of this LCT are covered by the local Moray Council landscape AGLV designations Findhorn Bay and Burghead to Lossiemouth AGLVs. LCT4 exhibits a medium level of scenic quality and is considered to be in a good and well managed condition with a low level of perceptual qualities owing to the strong presence of infrastructural development and settlement and a medium level of cultural value owing to the presence of historical buildings such as grand houses and castles. *Landscape Susceptibility:* ***Low***. This LCT is large in scale and geographical extent with an open character, regular pattern and a gentle landform. It is moderately inter-visible with neighbouring character areas, particularly the uplands to the south which form long, even ridgelines on the skyline. Low level of perceptual qualities such as naturalness or wildness owing to well settled character and built infrastructure and key regional routes which pass through this landscape. *Overall Landscape Sensitivity:* ***Low*** sensitivity
Existing characteristics and experience (including cumulative baseline 1)
This is an extensive, open landscape with a well settled and highly managed appearance and no strong perceptual qualities. It exhibits mixed heritage and industrial influences and long views tend to focus on the uplands of Moray to the south with views to the sea often screened by forest or landform. Visibility of the operational Paul's Hill Wind Farm generally extends across the low, distinct ridgeline between Burghead and Lossiemouth, which separates this LCT from the coastal margin landscape in this area. In addition, visibility extends to the eastern edge of the LCT south of Buckie and up to Findochty. Further visibility occurs in the western extreme of the LCT around Brodie Castle and the small settlement of Dyke. Visibility of Berryburn extends visibility of operational developments to east of Elgin and around Forres and Hill of Towie I opens up visibility further south-east into the LCT around Mosstodloch with the Rothes I and II developments extending

Coastal Farmland LCT (4)
visibility across Elgin and the southern edge of the LCT where it merges with the Rolling Farmlands. LCT10 and 11 form a noticeable backdrop to long distance views from LCT4 and blade tips of Berryburn and nacelles of the operational Paul's Hill are visible on this long low ridge from areas such as Lossiemouth. This is demonstrated by the Illustrative VPC Lossiemouth contained in the Scoping Report (Appendix 1.1) . Rothes I and Rothes II are also perceptible features on this skyline but appear well separated from the Paul's Hill and Berryburn developments. Some of the lower lying areas of the plain experience semi enclosed views due to woodland blocks, built infrastructure and roadside vegetation.
Predicted experience of proposed development (including cumulative baseline 1)
The existing extent of visibility of operational wind farm developments within this LCT would be extended slightly by the proposed Paul's Hill II Wind Farm. This can be seen in Figure 6.11a and includes two small patches of additional visibility, west of Duffus Castle and south of Rathven and Port Gordon in the east of the LCT. From areas where the proposed development would be visible in conjunction with the operational Paul's Hill and Berryburn developments, Paul's Hill II Wind Farm appears as a cluster of turbine nacelles, partial towers and blade tips continuing the broken line of operational Paul's Hill turbines on this long distance skyline ridge. The difference in proposed turbine heights would be theoretical visible but in reality the long distance view and intervening visual filters would mitigate this difference and the proposed Paul's Hill II Wind Farm would fit into the general pattern of wind farm development on this distant backdrop ridgeline.
Predicted Cumulative experience of proposed development with cumulative baseline Scenarios 2 & 3
As demonstrated by Cumulative ZTVs Figures 6.11a-k, the visibility of scenario 2 consented wind farm developments of Meikle Hill and Kellas within this LCT largely overlap with the operational development of Rothes I and II. Hill of Glaschyle extends visibility around Kinloss and Hill of Towie II overlaps largely with Hill of Towie I operational wind farm visibility. Additional visibility for the consented Dorenell is barely perceptible, and the Cairn Duhie development would largely overlap with visibility of the Hill of Glaschyle development. The proposed Paul's Hill II Wind Farm largely fits in with the existing visibility of scenario 2 developments, with small areas of additional visibility where there was none before. Largely, the proposed development would be seen in the context of the operational developments. The scenario 3 proposed Dorenell Variation and Extension would barely increase the visible spread and density of operational turbines. The proposed Paul's Hill II Wind Farm largely fits in with the existing visibility of scenario 3 developments, with small areas of additional visibility where there was none before. Largely, the proposed development would be seen in the context of the operational developments. There is very little additional visibility as a result of Paul's Hill II Wind Farm to that which already occurs as a result of operational, scenario 1, 2 and 3 developments. Some limited changes to the composition of such views would occur as detailed above, mainly minor landscape change to the distant skyline but it is considered the key characteristics of LCT4, including openness, settled nature and regular pattern would remain unaffected.
Magnitude of Landscape Change
Geographical Extent: ***Small.*** It is considered a small area of the overall LCT is affected. *Size and Scale:* ***Minor***. The difference in proposed turbine size to those of the operational turbines of Paul's Hill and Berryburn is theoretically evident from the areas of visibility of the proposed development highlighting the difference in the relationship between the operational and proposed turbines. Distance and intervening features filtering southern views mitigate this difference. *Duration and Reversibility:* ***Long*** term theoretically ***reversible*** change *Overall Magnitude of landscape change:* ***Slight.*** Magnitude of landscape change causing a minor alteration to southern skyline. The underlying character of LCT4 including its openness, settled nature and regular pattern would remain unaffected.

Coastal Farmland LCT (4)
Magnitude of Cumulative Landscape Change
Slight magnitude of Cumulative Change in respect of the existing/consented developments (Scenario 1). No further cumulative landscape change for scenarios 2 and 3. Magnitude of Cumulative Change remains ***Slight***.
Landscape Effect
Minor and ***Not significant.*** Considered a not significant overall landscape effect owing to the experience of the proposed development in the context of operational wind farms and the localised effect on one feature of this LCT, the distant skyline. Other key characteristics remain unaffected.
Cumulative Landscape Effect
Minor and ***Not significant*** for scenario 1 developments. Cumulative landscape effect remains ***Minor*** and ***Not significant*** for scenario 2 and scenario 3 as no further cumulative landscape change.

Table 6.13: Rolling Farmlands and Forest and Valleys LCT (5a)

Rolling Farmlands and Forest and Valleys LCT (5a)
Location
Rolling Farmlands and Forest and Valleys LCT (5a) is a Sub-Type of the Rolling Farmland and Forests LCT5 which extends east to west across Moray, in a broad band of land forming a transition between the coastal plain and the uplands. LCT5a comprises the Lossie and Pluscarden valleys and lies 7.5 km to the north of the proposed Paul's Hill II Wind Farm.
Sensitivity
Landscape Value: ***High***. The southern part of this LCT is covered by the local Moray Council Pluscarden landscape AGLV designation. LCT5a exhibits a high level of scenic quality and is considered to be in a good and well managed condition with strong perceptual and cultural qualities associated with Pluscarden Abbey. However any sense of naturalness is lessened by the presence of extensive forestry. *Landscape Susceptibility:* ***Medium***. This LCT is medium in scale and geographical extent with a strongly enclosed character and a varied landform forming an alternating pattern of ridge-valley-ridge-valley. It is a largely inward looking landscape with strongly containing skylines comprising the forested Hill of Wangie and Heldon Hill ridges. *Overall Landscape Sensitivity:* ***Medium*** sensitivity
Existing characteristics and experience (including cumulative baseline 1)
This is a strongly contained inward looking landscape with extensive woodland and forested ridgelines forming strong skylines. Strong perceptual qualities are associated with its sense of history. Visibility of the operational Paul's Hill Wind Farm extends across the two main forested ridgelines of Heldon Hill and Hill of the Wangie, the rising slopes of the upland plateau south of Dallas and the forested Quarrelwood Hill north-west of Elgin. Visibility of Berryburn and Hill of Towie I extend visibility of operational developments slightly to include lower slopes of the central ridgelines, and visibility of Rothes I and II increases visibility to include most of the settlement of Elgin and large bands of theoretical visibility across the span of the LCT. The extensive forestry within this LCT reduces actual visibility and the enclosing landform restricts outward views, to only glimpsed skyline views being obtained of the forested edges of the uplands, which contain the operational developments of Berryburn, Paul's Hill and Rothes I and II.
Predicted experience of proposed development (including cumulative baseline 1)
The existing extent of visibility of the operational Paul's Hill Wind Farm development within this LCT would be extended slightly by the proposed Paul's Hill II Wind Farm in three small areas west of Elgin, west of Dallas and around Blervie Castle to the north-west of Heldon Hill. Illustrative Wireline J of the scoping report

Rolling Farmlands and Forest and Valleys LCT (5a)
(Appendix 1.1) is located at the junction with the B9010 and the Dallas access road, and north of the settlement of Dallas, and indicates the theoretical view from this LCT and the change in the skyline resulting from the proposed Paul's Hill II Wind Farm. From areas where the proposed development would be visible in conjunction with the operational Paul's Hill and Berryburn developments, Paul's Hill II Wind Farm appears as a clear continuation of the operational Paul's Hill line of turbines and appear larger and closer to the viewer, with the visible difference between Paul's Hill operational turbines and the proposed Paul's Hill II Wind Farm turbines evident. In reality the forest enclosure and intervening vegetation further filters such views which would mitigate this difference and the proposed Paul's Hill II Wind Farm would fit into the general pattern of wind farm development on this backdrop ridgeline.
Predicted Cumulative experience of proposed development with cumulative baseline Scenarios 2 & 3
As demonstrated by Cumulative ZTVs Figures 6.11a-k, the visibility of scenario 2 consented wind farm developments of Meikle Hill and Kellas within this LCT largely overlap with the operational development of Rothes I and II with some slight extension of visibility. Hill of Glaschyle further extends visibility around Forres and Hill of Towie II overlaps with Hill of Towie operational wind farm visibility. The Cairn Duhie development would largely overlap with visibility of the Hill of Glaschyle development. Visibility for the consented Dorenell also overlaps with visibility of operational developments. The proposed Paul's Hill II Wind Farm fits in with the existing visibility of scenario 1 and 2 developments, with no areas of additional visibility where there was none before. Largely, the proposed development would be seen in the context of the operational or scenario 2 developments, Meikle Hill and Kellas being more prominent features further east along the enclosing ridge than the proposed Paul's Hill Wind Farm turbines. The scenario 3 proposed Dorenell Variation and Extension would barely increase the visible spread and density of operational and scenario 2 turbines. The proposed Paul's Hill II Wind Farm fits in with the existing visibility of scenario 3 developments, with no areas of additional visibility where there was none before. There is very little additional visibility as a result of Paul's Hill II Wind Farm to that which already occurs as a result of operational developments, scenario 1 and no additional visibility to that which already occurs as a result of scenario 2 and 3 developments. Some limited changes to the composition of such views would occur as detailed above, mainly negligible landscape change to the enclosing skyline but it is considered the key characteristics of LCT5a would remain unaffected.
Magnitude of Landscape Change
Geographical Extent: ***Small.*** It is considered a small area of the overall LCT is affected. *Size and Scale:* ***Negligible***. The difference in proposed turbine size to those of the operational turbines of Paul's Hill and Berryburn is theoretically evident from the areas of visibility of the proposed development highlighting the difference in the relationship between the operational and proposed turbines and affecting the visible skyline in this enclosed landscape. Forestry cover mitigates this difference. *Duration and Reversibility:* ***Long*** term theoretically ***reversible*** change *Overall Magnitude of landscape change:* ***Slight.*** Magnitude of landscape change causing a minor alteration to the southern skyline. Forestry screening mitigates effect and the underlying character of LCT5a including its strong perceptual and cultural qualities linked to the Pluscarden Abbey, remain unaffected.
Magnitude of Cumulative Landscape Change
Slight magnitude of Cumulative Change in respect of the existing/consented developments (scenario 1). Reduction in magnitude of cumulative landscape change for scenarios 2 and 3 to ***Negligible*** owing to the presence of Meikle Hill and Kellas which share the visible skyline with the proposed Paul's Hill II Wind Farm but are seen as more prominent features.
Landscape Effect

Rolling Farmlands and Forest and Valleys LCT (5a)
Moderate and ***Not significant.*** Considered a not significant overall landscape effect owing to the experience of the proposed development from this LCT in the context of operational wind farms and the localised effect on one feature of this LCT, the glimpsed skyline. Other key characteristics remain unaffected.
Cumulative Landscape Effect
Moderate and ***Not significant*** for scenario 1 developments. Despite reduction in magnitude of landscape change for scenarios 2 and 3, Cumulative landscape effect remains ***Moderate*** and ***Not significant*** for scenario 2 and scenario 3 owing to high landscape value.

Table 6.14: MN10: Open Uplands LCT

MN10: Open Uplands LCT
Location
A westwards extension of the LCT11 Open Rolling Uplands that also extends into the Strathdearn Hills which form the 'foothills' of the Cairngorms on the northern boundary of the CNP. This LCT also includes a thin strip of landscape between LCT11 and CNG2 to the south-west of the proposed development and wraps around the upper reaches of the Findhorn Valley. This part of the LCT is located 1.8 km to the south-west of the proposed development with the main part of this LCT located 14.4 km at its nearest point to the west of the proposed Paul's Hill II Wind Farm.
Sensitivity
Landscape Value: ***Medium***. This LCT is covered by the local Highland Council Drynachan, Lochindorb and Dava Moor SLA designation, exhibits high level scenic qualities and is in an average good condition. It is a common occurring LCT throughout Scotland and is true to its type. The perceptual qualities of naturalness and wildness are high in the core upland areas around Lochindorb and the proximity of the CNP has determined a high level of recreational value. *Landscape Susceptibility:* ***Medium***. This LCT is large in scale and geographical extent with an open character, simple pattern and land cover and a gentle landform. It is strongly inter-visible with neighbouring character areas with strong mixed developed/undeveloped skylines owing to operational developments and retains high perceptual qualities due to the long views possible across the CNP and neighbouring valley landscapes. It is considered that the landscape characteristics of this LCT including its large scale nature and openness have some ability to accommodate certain elements of the development without undue adverse effects. *Overall Landscape Sensitivity:* ***Medium*** sensitivity
Existing characteristics and experience (including cumulative baseline 1)
This is an extensive landscape with large central areas being relatively inaccessible due to its sparse population and few minor roads. Key characteristics and features include the sense of wildness in the more remote parts of the moorland and the distinct feature of Lochindorb with its island castle. Visibility of the existing Paul's Hill I Wind Farm occurs in the thin strip of this LCT in the eastern extremity of the character area, closest to the operational Paul's Hill development. Further west, visibility of Paul's Hill occurs from the elevated parts of the Dava Moor and the containing hills to the north of Lochindorb with larger patches of visibility extending out to the western edge of this LCT and following the ridgelines of higher ground within this moorland. The Berryburn development visibility increases the visibility of operational turbines substantially within this LCT, from along the Divie Valley and north and west around Lochindorb and stretches of the B9007, whereas visibility of Rothes I and II broadly overlaps with visibility of Paul's Hill. Clashindarroch and Hill of Towie do not extend existing areas of operational turbine visibility. Overall glimpses of operational turbines occur throughout the LCT with the main patches of visibility occurring to the west of the LCT at a

MN10: Open Uplands LCT
distance of between 21 -30 km from the proposed development. In such areas the perceptual qualities remain high but are reduced in closer proximity to the operational developments.
Predicted experience of proposed development (including cumulative baseline 1)
The existing extent of visibility of operational wind farm developments within this LCT would barely be extended by the proposed Paul's Hill II Wind Farm, with the patches of theoretical visibility which occur in the western part of the LCT mainly comprising partial visibility of between 1-4 nacelles with only small areas of between 5-7 nacelles occurring. This can be seen in Figure 6.11a. Across the whole LCT, only a 320 m additional section of the A939 would experience theoretical visibility of turbines where there was none before. In reality, existing roadside intermittent vegetation along this section of the road filters views towards the proposed development. The landscape ridgeline feature created by the summits of Carn Kitty, Sliabh Bainneach and Carn Ghiubhais, to the east of Moidach More and within LCT11 Open Rolling Uplands, screens visibility of the operational Paul's Hill development and the proposed Paul's Hill II Wind Farm from large areas of both LCT11 and MN10, such that the proposed development will mostly be viewed within the context of operational Paul's Hill turbines and almost always be viewed in the context of other operational turbine developments with the exception of the short stretch along the A939 which is mostly screened by roadside vegetation. The thin strip of MN10 between LCT 11 and CNG2 shows scattered, mainly partial visibility on the lower rising slopes of Glen Gheallaidh within 1.8 km of the proposed development. Form this area the difference in turbine size between the Paul's Hill, Berryburn operational turbines and the proposed turbines would be noticeable, but this is not an easily accessed location with no road routes or designated rights of way leading to very little change in the overall landscape experience in this area. Where visible, from the other areas of the LCT, the proposed turbines would generally be seen as additional features on the receding skyline fitting within the operational turbine pattern.
Predicted Cumulative experience of proposed development with cumulative baseline Scenarios 2 & 3
As demonstrated by Cumulative ZTVs Figures 6.11a-k, the visibility of scenario 2 consented wind farm developments of Meikle Hill, Kellas, Hill of Towie II and the consented Dorenell within this LCT largely overlap with the operational development of Paul's Hill as does the visibility of the proposed Paul's Hill II Wind Farm. Hill of Glaschyle visibility creates additional large patches of turbine visibility where there was none before largely to the north and west of Dava Moor. The Hill of Glaschyle turbines are located 5 km from the nearest point of LCT MN10 and well separated from the proposed development. There is no visibility from these additional areas of the proposed Paul's Hill II Wind Farm. The presence of the consented Carin Duhie which is located in this LCT would infill turbines visibility where there was none before, within 3 km of the Cairn Duhie development to the south, within 3.5 km to the east and within 7 km to the north and west. The experience of this LCT from such routes as the B9007 and A939 travelling through the LCT north-South would be substantially altered by the presence of Cairn Duhie at such close proximity. This would form a dominant feature in the LCT mitigating any moderate magnitude of landscape change resulting from the addition of the Paul's Hill II Wind Farm on the more distant skylines to the east. The scenario 3 proposed Dorenell Variation and Extension would not increase turbine visibility over and above other cumulative developments already seen in conjunction with Paul's Hill II development and has very little combined visibility with the proposed development.
Magnitude of Landscape Change
Geographical Extent: ***Medium.*** It is considered a moderate extent of the overall LCT is affected. *Size and Scale:* ***Moderate***. The difference in proposed turbine size to those of the operational turbines of Paul's Hill and Berryburn is evident from the areas of visibility of the proposed development highlighting the difference in the relationship between the operational and proposed turbines. This is considered a major level in close proximity from a relatively inaccessible sloping section of moorland within 2 km of the proposed

MN10: Open Uplands LCT
development, and a minor level from the more distant patches of partial visibility in the western part of the LCT. This is considered to exert a moderate effect in terms of size and scale across the LCT overall. *Duration and Reversibility:* ***Long*** term theoretically ***reversible*** change *Overall Magnitude of landscape change:* ***Moderate.*** Magnitude of landscape change causing a minor alteration to eastern skylines. The underlying character of MN10 would remain unaffected with perceptual value remaining high and key inter-visibility with valley landscapes remaining unaffected.
Magnitude of Cumulative Landscape Change
Moderate magnitude of Cumulative Change in respect of the existing/consented developments (scenario 1). Reduces to ***Slight*** owing to the introduction of the prominent new feature of Cairn Duhie within the LCT MN10 in close proximity to publicly accessible areas which mitigates change resulting from the introduction of Paul's Hill II Wind Farm. at Remains ***Slight*** for scenario 3.
Landscape Effect
Moderate and ***not significant*** across the LCT as a whole but some localised moderate significant effects from within 2 km of the proposed development in the relatively inaccessible Glen Gheallaidh. Considered a not significant overall landscape effect owing to the experience of the proposed wind farm development in the context of operational turbines and the retention of key characteristics and features of this LCT which remain largely unaffected.
Cumulative Landscape Effect
Moderate and ***Not significant*** for scenario 1 developments. Cumulative landscape effect reduces to ***Minor*** for scenario 2 and remains ***Minor*** for scenario 3.

Table 6.15: CNG2: Uplands and Glens LCT: Strathdearn Hills LCA (Area 4)

CNG2: Uplands and Glens LCT: Strathdearn Hills LCA
Location
A southern extension of the MN10 Open Uplands and LCT11 Open Rolling Uplands and at the CNP boundary it then overlaps with the LCA 82 The Strathdearn Hills identified in the 2009 CNPLCA, (which has been scoped out of the final LVIA assessment due to limited visibility and its location further from the proposed development than CNG2 Uplands and Glen LCT: Strathdearn Hills, Area 4, as detailed in Appendix A6.3). CNG2 Area 4 is located 2.2 km at its nearest point to the south-west of the proposed Paul's Hill II Wind Farm.
Sensitivity
Landscape Value: ***High***. This LCT is covered by the National designation of the Cairngorms National Park at its southern end, (although outwith the part of the CNG2: Area 4 under consideration), exhibits high level scenic qualities and is in a good overall condition. The perceptual qualities of naturalness and wildness are high in the core upland areas around Lochindorb and further south the CNP has determined a high level of recreational value. *Landscape Susceptibility:* ***Medium***. This LCT is large in scale and geographical extent with an open character, simple pattern and land cover and a gentle landform although some distinct features such as small pockets of native pine and muir burning and rocky outcrops create distinctive irregular pattern of different colours and textures in places. It is strongly inter-visible with neighbouring character areas with strong undeveloped skylines to the south and mixed developed/undeveloped skylines owing to operational developments to the north and retains high perceptual qualities due to the long views possible across the CNP and neighbouring valley landscapes. It is considered that the landscape characteristics of this LCT including its large scale

CNG2: Uplands and Glens LCT: Strathdearn Hills LCA
nature and openness have some ability to accommodate certain elements of the development without undue adverse effects. *Overall Landscape Sensitivity:* ***Medium*** sensitivity
Existing characteristics and experience (including cumulative baseline 1)
This is an extensive landscape with some areas being relatively inaccessible due to its sparse population and few minor roads while other areas are accessed by the Dava Way and the B9007 which pass through the LCA. Key characteristics and features include the usual openness and expanse of this upland landscape but it is punctuated by some distinct features such as small pockets of native pine and muir burning and rocky outcrops which create distinctive irregular pattern of different colours and textures in places. Sense of history and naturalness persist in some areas but the ruined state of some farmsteads and the Lochindorb island castle create a 'marginal appearance' which enhances the sense of wildness. Visibility of the existing Paul's Hill I Wind Farm occurs within 2 km of this operational development in the eastern extremity of the character area. Further west, visibility of Paul's Hill occurs from the elevated parts of the Dava Moor and the containing hills to the south of Lochindorb with scattered small patches of visibility extending out to the western edge of this LCT and following the summits of higher ground within this moorland. The Berryburn development visibility increases the visibility of operational turbines within this LCA, from along the Ourack Burn Valley and containing summits, including a stretch of the Dava Way. Rothes I and II create very little visibility all of which overlaps with the visibility of the operational Paul's Hill development from the Larig Hill ridgeline. There is no visibility of the operational Clashindarroch within this LCA and visibility of the Hill of Towie development broadly overlaps with other visibility of operational developments mainly from the Carn na Loine area. Overall glimpses of operational turbines occur from small patches throughout the LCA with the main patches of visibility occurring to the east of the LCA in close proximity to the operational developments of Paul's Hill and Berryburn. In such areas the perceptual qualities are reduced but key characteristics of openness and expanse remain.
Predicted experience of proposed development (including cumulative baseline 1)
The existing extent of visibility of operational wind farm developments within this LCT would barely be extended by the proposed Paul's Hill II Wind Farm, with the patches of theoretical visibility which occur in the western part of the LCA mainly comprising partial visibility of between 1-5 nacelles with only small areas of between 6-7 nacelles occurring to the eastern end of the LCA within 7 km of the proposed development. This can be seen in Figure 6.1 and 6.11a. The landscape ridgeline feature created by the summits of Carn na Loine and Carn an Fhuarain Mhoir within this LCA screens visibility of the operational Paul's Hill development and the proposed Paul's Hill II Wind Farm from further west resulting in only scattered visibility from the highest summits. Part of this area lies within the CNP and therefore within the LCA 82 Strathdearn Hills which has been scoped out of this LIA. However, such visibility which does exist would experience the proposed development within the context of the operational Paul's Hill turbines and always be viewed in the context of other operational turbine developments From the eastern extremity of the LCA, in close proximity to the this area the difference in turbine size between the Paul's Hill and Berryburn operational turbines and the proposed turbines would be noticeable, but this is not an easily accessed location with no road routes or designated rights of way leading to very little change in the overall landscape experience in this area. Where visible, from the other areas of the LCT, the proposed turbines would generally be seen as additional features on the receding skyline fitting within the operational turbine pattern.
Predicted Cumulative experience of proposed development with cumulative baseline scenarios 2 & 3
As demonstrated by Cumulative ZTVs Figures 6.11a-k, the visibility of scenario 2 consented wind farm developments of Meikle Hill, Kellas and Hill of Towie II overlap with the operational development of Paul's Hill as does the visibility of the proposed Paul's Hill II Wind Farm. Hill of Glaschyle visibility creates additional patches of turbine visibility where there was none before largely to the north of Carn na Loine with the

CNG2: Uplands and Glens LCT: Strathdearn Hills LCA
consented Dorenell extending such additional visibility further. These developments would be experienced as well separated developments from the proposed Paul's Hill II Wind Farm but would still contribute to further turbines in different sections of the skyline, increasing development on this skyline and affecting overall cumulative landscape effects. The presence of Scenario 2 Cairn Duhie which is located in LCT MN10 and would infill turbines visibility where there was none before, within 3 km of the Cairn Duhie development located 3.5 km to the north of this LCA would substantially increase visibility along the length of the Dava Way which cuts through this LCA. This would form a prominent feature from the more sensitive areas of this LCA and the experience of this LCA from such routes as the A939 and the Dava Way travelling through the LCA north-south would be substantially altered by the presence of Cairn Duhie at such close proximity. The proposed Paul's Hill II Wind Farm would not be visible from these areas. But rather from less accessed areas with small patches of glimpsed visibility at the same time as the operational Paul's Hill turbines, resulting in the experience of the proposed development as an extension of an existing line of turbines on the receding skylines to the east.
The scenario 3 proposed Dorenell Variation and Extension would not increase turbine visibility over and above other cumulative developments already seen in conjunction with Paul's Hill II development and has very little combined visibility with the proposed development.
Magnitude of Landscape Change
Geographical Extent: ***Small.*** It is considered a small extent of the overall LCA is affected.
Size and Scale: ***Minor***. The difference in proposed turbine size to those of the operational turbines of Paul's Hill and Berryburn is evident from the areas of visibility within 2 km and at 7 km of the proposed development highlighting the difference in the relationship between the operational and proposed turbines. This is considered a major level at 2 km and moderate level at 7 km reducing to a minor and negligible level of landscape change in terms of size and scale from the scattered visibility further west within the LCT. This is considered to exert a minor effect in terms of size and scale across the LCT overall.
Duration and Reversibility: ***Long*** term theoretically ***reversible*** change
Overall Magnitude of landscape change: ***Slight.*** Magnitude of landscape change causing a minor alteration to eastern skylines. The underlying character of Area 4 of CNG2 would remain unaffected with perceptual value remaining high and key inter-visibility with integrated glens remaining unaffected.
Magnitude of Cumulative Landscape Change
Slight magnitude of Cumulative Change in respect of the existing/consented developments (scenario 1). Reduces to ***Negligible*** for scenario 2 owing to the introduction of the prominent new feature of Cairn Duhie within the LCT MN10 in close proximity to publicly accessible areas which mitigates change resulting from the introduction of Paul's Hill II Wind Farm. Remains ***Neglgible*** for scenario 2.
Landscape Effect
Moderate and ***not significant*** across the LCT as a whole but some localised moderate significant effects from within 2 km of the proposed development in the relatively inaccessible Glen Gheallaidh. Considered a not significant overall landscape effect owing to the experience of the proposed wind farm development in the context of operational turbines and the retention of key sensitive characteristics and features of this LCT which remain largely unaffected.
Cumulative Landscape Effect
Moderate and ***Not significant*** for scenario 1 developments. Cumulative landscape effect remains ***Moderate*** and ***Not significant*** for scenario 2 and scenario 3 owing to the high landscape value of this LCA.

Table 6.16 CNG2: Uplands and Glens LCT: The North-Eastern Hills LCA (Area 6)

CNG2: Uplands and Glens LCT: The North-Eastern Hills LCA
Location
CNG2: Area 6 comprises containing hills of the Spey Valley and at the CNP boundary it then overlaps with the LCA 83 The Hills of Cromdale identified in the 2009 CNPLCA, (which has been scoped into the final LIA assessment) Only a small part of this extensive LCA has not been superseded by updated assessments such as the MWELCS and the CNPLCA. CNG2 Area 6 is located 2.2 km at its nearest point to the south-west of the proposed Paul's Hill II Wind Farm.
Sensitivity
Landscape Value: ***High***. This LCA is largely covered by the National designation of the Cairngorms National Park, (although outwith the part of the CNG2: Area 6 under consideration), exhibits high level scenic qualities and is in average condition as coniferous plantings are generally poorly integrated with the rolling character of the hills. The perceptual qualities of remoteness are high in the core upland areas around the Cairngorms massif and further south the CNP has determined a high level of recreational value.
Landscape Susceptibility: ***Medium***. This LCT is large in scale and geographical extent with a moderately open character, simple pattern and land cover and an intermediate variable landform with distinctive interlocking spurs. It is strongly inter-visible with neighbouring character areas with strong mixed developed/undeveloped skylines owing to operational developments to the north and strong undeveloped skylines to the south across the CNP. It retains high perceptual qualities due to the long views possible across the CNP and neighbouring valley landscapes. It is considered that the landscape characteristics of this LCA including its large scale nature and openness have some ability to accommodate certain elements of the development without undue adverse effects.
Overall Landscape Sensitivity: ***Medium*** sensitivity
Existing characteristics and experience (including cumulative baseline 1)
Considering the LCA as a whole, this is an extensive landscape with some areas being relatively inaccessible due to its sparse population and few roads. The area outwith the MLWELCS and CNPLCA areas comprises the northern section of the Cromdale hills including the summits of Carn Eachie, Carn a Ghille Chearr, Creag an Tarmachain, Craig Balnafuaran and Tom a Chait. Key characteristics and features include the immediate rounded summits and long smooth interlocking spurs and shallow valleys which cut through the hillside by small burns with glacial deposits peppering the larger valleys. Southern skylines also form a strong draw for the eye and there is a strong sense of remoteness due to the openness of the landscape and views toward the Cairngorms massif. The sample Viewpoint 5 taken from the summit of Carn a Ghille Chearr Figure 6.13e indicates the long views across the impressive topography of the CNP to the south and the Broad Spey Farmed Valley and background hills of LCT11 containing the proposed development to the north. Theoretical visibility of the existing Paul's Hill I Wind Farm occurs from the western slopes and summits of this range of the northern Cromdale hills between 7-11 km of this operational development. Throughout the rest of the LCA, within the CNP, and outwith the section of CNG2: Area 6 included in this LIA, visibility of operational developments extends to 33 km from the proposed development but is reduced to scattered patches of theoretical visibility from the highest summits with a large area of visibility north of Meall a' Bhuachaille. The other operational developments of Berryburn, Clashindarroch, Hill of Towie and Rothes I and II broadly overlap with visibility of Paul's Hill Wind Farm with the Hill of Towie and consented Dorenell development extending visibility to the eastern slopes of the hill range of the northern Cromwell hills within the part of the CNG2: Area 6 under consideration.
Predicted experience of proposed development (including cumulative baseline 1)
The existing extent of visibility of the operational wind farm developments within this LCA would not be extended by the proposed Paul's Hill II Wind Farm. This can be seen in Figure 6.13a. The sample VP5 Carn a

CNG2: Uplands and Glens LCT: The North-Eastern Hills LCA
Ghille Chearr, Figure 6.13e, does show the potential change in view with turbines appearing around Roy's Hill and appearing larger in size and closer to the viewer to the operational Paul's Hill and Berryburn turbines. The proposed turbines also increase the horizontal spread of the overall Paul's Hill development, producing an extended development focussed behind the landform of Roy's Hill. However, from this elevated viewpoint, the prominence of Roy's Hill as an elevated feature is substantially reduced as it blends into the rolling uplands on the other side of the Spey Valley from the viewer. From this perspective, the Paul's Hill extended development therefore appears to settle well within these uplands and is mostly backclothed against the retreating landform. Overall, the openness of the view is retained and southern key views remain unaffected.
Predicted Cumulative experience of proposed development with cumulative baseline scenarios 2 & 3
As demonstrated by Cumulative ZTVs Figures 6.11a-k, the visibility of scenario 2 consented wind farm developments of Meikle Hill, Kellas Hill of Towie and Hill of Glaschyle overlap with the operational developments of Paul's Hill as does the visibility of the proposed Paul's Hill II Wind Farm. The presence of Cairn Duhie would similarly not increase the extent of visibility of turbines from this LCT. Visibility of the consented Dorenell extends visibility further to the eastern slopes of the northern Cromdale Hills where there is no visibility of the proposed development. Where visible together, the Dorenell consented turbines appear in successive views to the proposed development as seen in Figure 6.13e. These developments would be experienced as well separated developments from the proposed Paul's Hill II Wind Farm but would still contribute to further turbines in different sections of the skyline, increasing development on this skyline and affecting overall cumulative landscape effects. The scenario 3 proposed Dorenell Variation and Extension would increase turbine visibility in addition to scenario 2 developments to the lower eastern slopes of the northern Cromdale Hills.
Magnitude of Landscape Change
Geographical Extent: ***Small.*** Although most of the small part of the CNG2: Area 6 indicates theoretical visibility and therefore some landscape change as a result of the introduction of the proposed development, in relation to the LCA as a whole which covers an extensive eastern area of the CNP, it is considered a small extent of the overall LCA is affected as visibility becomes scattered and more limited and distant further south-west. *Size and Scale:* ***Minor***. With regard to VP5, the screening of the full tower heights of most of the proposed turbines, mitigates the difference in turbine size of the proposed Paul's Hill II Wind Farm turbines compared to the original Paul's Hill and Berryburn turbines, although turbine no's. 6 and 7 remain highly visible above the existing vertical level of the Paul's Hill array. There is also a slight horizontal extension of the Paul's Hill array created by the proposed turbines. *Duration and Reversibility:* ***Long*** term theoretically ***reversible*** change *Overall Magnitude of landscape change:* ***Slight.*** Magnitude of landscape change causing a minor alteration to western skylines. The underlying character of Area 6 of CNG2 would remain unaffected with perceptual value or remoteness remaining high due to long southern views remaining unaffected and experience of the open, rounded summits of these northern Cromdale hills remaining.
Magnitude of Cumulative Landscape Change
Slight magnitude of Cumulative Change in respect of the existing/consented developments (scenario 1). Remains ***Slight*** for scenario 2 and 3 owing to the landscape fit of the proposed Paul's Hill II Wind Farm into the existing Paul's Hill array and the lack of new areas of visibility as a result of the proposed development where turbines were not present before.
Landscape Effect
Moderate and ***not significant*** across the LCT as a whole. Considered a not significant overall landscape effect owing to the experience of the proposed development in the context of operational turbines and the

CNG2: Uplands and Glens LCT: The North-Eastern Hills LCA
retention of key inter visibility with the CNP to the south and experience of rounded summits in the immediate vicinity remaining unaffected. Limited landscape effect on western skylines.
Cumulative Landscape Effect
Moderate and ***Not significant*** for scenario 1 developments. Cumulative landscape effect remains ***Moderate*** and ***Not significant*** for scenario 2 and 3.

Table 6.17: CNG3: Cairngorm Straths LCT: Lower Spey (Area 14)

CNG3: Cairngorm Straths LCT: Lower Spey (Area 14)
Location
CNG3: Area 14 is an extension of the LCA7 of the Broad Farmed Spey Valley and at the CNP boundary becomes the updated assessment area of LCA68 Lower Strathspey: Strathspey (which has been scoped out of the final LIA assessment due to limited visibility as detailed in Appendix A6.3). Both these areas supersede CNG3 Area 14 except for the small area between these updated LCT/LCA around Advie. CNG3 Area 14 is located 6.6 km at its nearest point to the south of the proposed Paul's Hill II Wind Farm.
Sensitivity
Landscape Value: ***Medium***. This LCA is largely covered by the National designation of the Cairngorms National Park, (although outwith the part of the CNG3: Area 14 under consideration), exhibits medium level scenic qualities and is in average condition as extensive forestry plantings cover the side slopes. Considered to be medium level recreational value owing to extensive tree cover restricting access in places and medium level perceptual qualities owing to the settled nature of the valley but with some cultural value linked to whisky production. *Landscape Susceptibility:* ***Medium***. This LCA is medium in scale with a moderately enclosed character as the river channel narrows within this LCA. It has a rather complex land cover and vegetation pattern comprising broadleaved woodlands following the Spey, more extensive coniferous plantations generally covering the hill tops, native pine and ornamental trees within policy woodlands, enclosed pastures, and the coarser textures of unimproved pastures/open grass/heather moorland on hill tops. It is a more inward looking landscape than the neighbouring upland LCAs, enclosed by mixed developed/undeveloped skylines and with lower perceptual qualities due to the heavily settled nature of Strathspey. *Overall Landscape Sensitivity:* ***Medium*** sensitivity
Existing characteristics and experience (including cumulative baseline 1)
The area outwith the MLWELCS and CNPLCA areas comprises a narrower section of Strathspey and the lower western slopes of the summit of Creag an Tarmachain, part of the chain of northern Cromdale hills in the neighbouring LCA of CNG2: LCA 6. Key characteristics and features include the visually diverse vegetation pattern, the sense of heritage related to the numerous whisky distilleries such as Tormore Distillery and the mixed settlement pattern from large planned towns to the isolated vernacular farmsteads. This is a rather inward looking landscape, owing to the landform and vegetation enclosure present in the LCA. The sample Viewpoint 1 taken from the frontage of the Tormore Distillery Figure 6.13a indicates the mixed vegetation pattern, the heritage value of key buildings such as the distillery complex and the containing topography of the valley. Theoretical visibility of the existing Paul's Hill I Wind Farm occurs from the eastern bank of the Spey, from the lower, often forested slopes of Tom a Chait and Creag an Tarmachain. Within the CNP and outwith the area of CNG3: Area 14 under consideration in this LIA, visibility of the original Paul's Hill Wind Farm continues along this bank of Spey toward Grantown with forested plantations becoming more extensive. The other operational developments of Berryburn, Clashindarroch, Hill of Towie, the consented

CNG3: Cairngorm Straths LCT: Lower Spey (Area 14)
Dorenell and Rothes I and II broadly overlap with visibility of the original Paul's Hill Wind Farm adding very little additional visibility to this valley landscape.
Predicted experience of proposed development (including cumulative baseline 1)
The existing extent of visibility of the operational wind farm developments within this LCA would be slightly extended by the proposed Paul's Hill II Wind Farm, as lower slopes experience partial visibility of up to 2 proposed turbine nacelles where there was no turbine visibility before. This is a narrow strip of land and can be seen in Figure 6.13a. The sample VP1 Tormore Distillery does show the potential change in view with 2 nacelles and 3 blade tips of the potential development theoretically visible. In reality as shown in Figure 6.14a, 2 blade tips are barely discernible owing to the intervening topography and distance of the viewpoint, leaving Turbine No's. 5, 6 and 7 as noticeable features on the skyline. There will be combined simultaneous visibility of the proposed turbines with the original Paul's Hill turbines. The proposed turbines overlap with the original Paul's Hill turbines and continue the original line across a small portion of the skyline, integrating the two schemes. The proposed Paul's Hill II turbines appear larger than the original Paul's Hill turbines making the overall wind farm development appear closer to the viewer and extending the depth of the development. Overall, the openness of the view is retained and there is a noticeable visual change to the skyline. In reality, throughout the LCA, the extent of visibility would be reduced by the extensive areas of existing vegetation, screening outward views.
Predicted cumulative experience of proposed development with cumulative baseline scenarios 2 & 3
As demonstrated by Cumulative ZTVs Figures 6.11a-k, the visibility of scenario 2 consented wind farm developments of Meikle Hill, Kellas, Hill of Glaschyle and Cairn Duhie add virtually no new visibility to this LCA. Visibility of the consented Dorenell adds a small pocket of visibility on the forested upper slopes of Straan wood where there is no visibility of the proposed development and Hill of Towie slightly extends visibility of the operational Hill of Towie Wind Farm, mainly in the valley bottom where there is no visibility of the proposed development. scenario 3 developments of Dorenell Variation and Extension also do not add any additional visibility to this LCA. As demonstrated by VP1, there is no additional landscape change as a result of Paul's Hill II Wind Farm being added to the scenario 2 and 3 developments.
Magnitude of Landscape Change
Geographical Extent: ***Medium.*** Although most of the eastern bank of this small part of the CNG3: Area 14 indicates theoretical visibility and therefore some landscape change as a result of the introduction of the proposed development, in relation to the LCA as a whole which covers a more extensive area, it is considered a medium extent of the overall LCA is affected as visibility becomes more scattered further south. *Size and Scale:* ***Moderate***. With regard to VP1, the screening of the full tower heights of most of the proposed turbines, mitigates the difference in turbine size of the proposed Paul's Hill II turbines compared to the original Paul's Hill turbines to some degree, although turbine no's. 5, 6 and 7 remain visible above the existing vertical level of the Paul's Hill array. There is also a slight horizontal extension of the Paul's Hill array created by the proposed turbines. Overall moderate landscape change in terms of size and scale of proposed development owing to a noticeable landscape change to the visible enclosing skyline. *Duration and Reversibility:* ***Long*** term theoretically ***reversible*** change *Overall Magnitude of landscape change:* ***Moderate.*** Magnitude of landscape change causing a partial alteration to the containing skyline and affecting heritage qualities owing to the increased presence of turbine development. The underlying character of Area 14 of CNG3 would however remain unaffected owing to the reduced extent of visibility by existing vegetation, the context of existing turbine development and the diversity of this vegetation and settlement pattern would remain unaffected.
Magnitude of Cumulative Landscape Change

CNG3: Cairngorm Straths LCT: Lower Spey (Area 14)
Moderate magnitude of Cumulative Change in respect of the existing/consented developments (scenario 1). Remains ***Moderate*** for scenario 2 and 3.
Landscape Effect
Moderate and ***not significant*** across the LCT as a whole. Considered a not significant overall landscape effect owing to the proposed wind farm extension being experienced mostly in the context of the operational Paul's Hill turbines. This mitigates potential effect on the heritage qualities as the operational line of turbines is being added to rather than new features being seen on the skyline. Key internal characteristics such as the diverse settlement and vegetation patterns are also retained.
Cumulative Landscape Effect
Moderate and ***Not significant*** for scenario 1 developments. Cumulative landscape effect remains ***Moderate*** and ***Not significant*** for scenario 2 and 3.

Table 6.18: Hills of Cromdale Landscape Character Area (LCA83)

Hills of Cromdale Landscape Character Area (LCA83)
Location
An updated assessment and continuation of CNG2: Area 6 at the CNP boundary, extending southwards to include the full range of the Cromdale Hills. LCA83 is located 9.2 km at its nearest point to the south of the proposed Paul's Hill II Wind Farm.
Sensitivity
Landscape Value: ***High***. This LCA is covered by the National designation of the Cairngorms National Park, exhibits high level scenic qualities and is in good condition. The perceptual qualities of remoteness are high in along the spine of hills and the CNP has determined a high level of recreational value. *Landscape Susceptibility:* ***Medium***. This LCT is large in scale and geographical extent with an open character, simple pattern and land cover and a distinctive landform of an easily recognised spine of hills, deeply incised by river valleys. It is strongly inter-visible with neighbouring character areas forming a strong visual backdrop and undeveloped skyline to the adjacent Strath Avon, the Haughs of Cromdale and the Glen of Dalvey. It retains high perceptual qualities due to the long views possible across the CNP and neighbouring valley landscapes. It is considered that the landscape characteristics of this LCA including its large scale nature and openness have some ability to accommodate certain elements of the development without undue adverse effects. *Overall Landscape Sensitivity:* ***Medium*** sensitivity
Existing characteristics and experience (including cumulative baseline 1)
This is a large scale landscape with a range of high rising summits and deeply incised river valleys with panoramic views southwards toward the North-eastern hills and the Cairngorm massif and high cultural qualities on lower slopes, associated with prehistoric and pre-improvement settlements. The southern skylines also form a strong draw for the eye and there is a strong sense of remoteness due to the openness of the landscape and views toward the Cairngorms massif. The spine of hills upon which this LCA is based include the summits of Carn a Ghille Chearr, Carn Eachie, An Sgoran, Creagan a Chaise, Carn Tuarneir, Carn na Cloiche and Sgor Gaoithe. The sample Viewpoint 5 is taken from the northern boundary of this LCA, from the summit of Carn a Ghille Chearr, is illustrated in Figure 6.13e and indicates the long views across the impressive topography of the CNP to the south and the Broad Spey Farmed Valley and background hills of

Hills of Cromdale Landscape Character Area (LCA83)

LCT11 containing the proposed development to the north. Theoretical visibility of Paul's Hill I Wind Farm occurs from the western slopes and summits of the range of the Cromdale Hills which lie between 9-21 km of this operational development. Visibility of Berryburn is limited to the higher slopes and seen in context of the operational Paul's Hill development as is the visibility of Rothes I and II. The eastern slopes of the Cromdale hills currently experience no visibility of operational turbines.

Predicted experience of proposed development (including cumulative baseline 1)

There is no additional extent of visibility of the proposed Paul's Hill II Wind Farm where there was no visibility before of operational developments. This can be seen in Figure 6.11a. The sample VP5 Carn a Ghille Chearr, Figure 6.13e, does show the potential change in view with turbines appearing around Roy's Hill and appearing larger in size and closer to the viewer to the operational Paul's Hill and Berryburn turbines. The proposed turbines also increase the horizontal spread of the overall Paul's Hill development, producing an extended development focussed behind the landform of Roy's Hill. However, from this elevated viewpoint, the prominence of Roy's Hill as an elevated feature is substantially reduced as it blends into the rolling uplands on the other side of the Spey Valley from the viewer. From this perspective, the Paul's Hill extended development therefore appears to settle well within these uplands and is mostly backclothed against the retreating landform. VP5 also represents the closest view from this LCA. Overall, the openness of the view is retained and southern key views remain unaffected.

Predicted Cumulative experience of proposed development with cumulative baseline scenarios 2 & 3

As demonstrated by Cumulative ZTVs Figures 6.11a-k, the visibility of scenario 2 consented wind farm developments of Meikle Hill, Kellas, Hill of Towie II and Hill of Glaschyle overlap with the operational developments of Paul's Hill. Visibility of the consented Dorenell extends visibility further to the eastern slopes of the Cromdale Hills where there is no visibility of the proposed development. Where visible together, the Dorenell consented turbines appear in successive views to the proposed development as seen in Figure 6.13e. As shown in Figure 6.13g, the presence of Cairn Duhie would increase the extent of visibility from the western slopes of this LCT, infilling gaps in visibility of operational developments. These newly extended areas have no visibility of the proposed development. These scenario 2 developments would be experienced as well separated developments from the proposed Paul's Hill II Wind Farm but would still contribute to further turbines in different sections of the skyline, increasing development on this skyline and affecting overall cumulative landscape effects.

The scenario 3 proposed Dorenell Variation and Extension would increase turbine visibility in addition to scenario 2 developments to the lower eastern slopes of the Cromdale Hills. These newly extended areas have no visibility of the proposed development.

Magnitude of Landscape Change

Geographical Extent: ***Large.*** Most of the western slopes of the range of the Cromdale Hills experience visibility of the proposed development with partial visibility of the proposal occurring on the lower slopes and full visibility of all 7 proposed turbines limited to the summit areas and upper slopes.

Size and Scale: ***Minor***. With regard to VP5, the screening of the full tower heights of most of the proposed turbines, mitigates the difference in turbine size of the proposed Paul's Hill II Wind Farm turbines compared to the original Paul's Hill and Berryburn turbines, although turbine no's. 6 and 7 remain highly visible above the existing vertical level of the Paul's Hill array. There is also a slight horizontal extension of the Paul's Hill array created by the proposed turbines. This is the closest experience of the proposed development from within this LCA with potential landscape change mitigated with distance further south-west into the LCA.

Duration and Reversibility: ***Long*** term theoretically ***reversible*** change

Overall Magnitude of landscape change: ***Moderate.*** Magnitude of landscape change causing a partial alteration to north-western skylines. The underlying character of LCA83 would remain unaffected with

Hills of Cromdale Landscape Character Area (LCA83)

perceptual value or remoteness remaining high due to long southern views remaining unaffected and experience of the open, rounded summits of these Cromdale hills remaining.

Magnitude of Cumulative Landscape Change

Moderate magnitude of Cumulative Change in respect of the existing/consented developments (scenario 1). Remains ***Moderate*** for scenario 2 and 3 owing to the landscape fit of the proposed Paul's Hill II Wind Farm into the existing Paul's Hill array and the lack of new areas of visibility as a result of the proposed development where turbines were not present before.

Landscape Effect

Moderate and considered ***Not Significant*** across the LCA as a whole. The high value of the LCA and extent of visibility determine a moderate level of landscape effect but this is considered not significant as the visibility would be experienced in the context of the operational development of Paul's Hill and key inter visibility with the CNP to the south and experience of the rounded summits in the immediate vicinity remain unaffected. Limited landscape effect on north-western skylines.

Cumulative Landscape Effect

Moderate and ***Not significant*** for scenario 1 developments. Cumulative landscape effect remains ***Moderate*** and ***Not significant*** for scenario 2 and 3.

Summary of Effects on Landscape Character

6.8.16 Potential landscape effects during the Construction Phase for the LCT containing the proposed development; LCT11 Open Rolling Uplands is considered to be Moderate and Significant. It is considered a significant overall landscape effect owing to the extent of operations and vehicular movements to and from the site within the LCT during this phase. Following reinstatement post construction, this landscape effect on LCT11 is predicted to be Moderate and Not significant, owing to the localised nature of the change, which is considered to be nearer the borderline minor/moderate magnitude level of change. Following reinstatement Post Decommissioning, the proposed development area will be returned to open moorland with no residual landscape effects predicted.

6.8.17 One out of the eleven identified LCAs/LCTs has been identified as potentially experiencing Moderate/Major and Significant landscape and cumulative effects for cumulative baseline 1 (operational wind farm developments). This is LCT7 Broad Farmed Valley as identified by MWELCS. The value of this landscape receptor is considered to be High due to its enclosed nature and importance of enclosing skylines and its rich heritage and cultural value linked to the Whisky industry. This resulted in a borderline Medium overall sensitivity, almost high. The Moderate magnitude of change at this viewpoint was largely based on the noticeable landscape change around Roy's Hill, an identified 'Landmark Hill' visible on the containing skyline as a result of the moderate contrast present between the different turbine sizes of the proposed and original Paul's Hill turbines and the medium geographical extent of visibility throughout the LCT. However, other operational developments will generally be experienced at the same time as the proposed development and the landmark feature of Roy's Hill is not the only key landmark hill enclosing the LCT. All other distinctive hills enclosing LCT7 remain unaffected by the proposed wind farm development. These mitigating factors lead to the conclusion that this significant effect is an acceptable and localised significant effect.

6.8.18 A further eight of the remaining ten LCAs/LCTs were considered to experience a Moderate level of landscape effect which has been considered in each case to represent a not significant effect, owing to the localised nature of the identified landscape effect, the key characteristics and features of the landscape character remaining unaffected with often only one of the features affected, namely the visible skyline and the experience of the proposed Paul's Hill II Wind Farm turbines within the context of the operational Paul's Hill turbines. The proposed turbines are therefore nearly always being introduced into a mixed, often developed skyline rather than introducing turbines into a skyline with no turbine development. These Character Types/Areas experiencing moderate and Not

Significant levels of landscape effect include the LCTs of LCT11 Open Rolling Upland, LCT12a Open Upland with Steep Slopes, LCT5a Rolling Farmlands and Forest and Valleys, MN10 Open Uplands, Areas 4 and 6 of the CNG2: Uplands and Glens, Area 14 of CNG3: Cairngorm Straths and LCA 83 Hills of Cromdale.

6.8.19 Out of these 8 LCTs/LCAs experiencing moderate landscape effects, 4 were assessed as experiencing moderate levels of magnitude of landscape change. In the case of LCT11 Open Rolling Upland, MN10 Open Uplands and Area 14 CNG3: Cairngorm Straths, this was due to the moderate level of the size and scale element of the magnitude of change owing to a noticeable landscape change to the visible enclosing skyline. This resulted from differences in turbines size between the operational and proposed Paul's Hill developments. In the case of LCA 83 The Cromdale Hills, the moderate magnitude of change resulted from the large geographical extent of potential landscape change considered to occur throughout this LCA.

6.8.20 Minor and not significant effects are considered to occur within LCT10 Upland Moorland and Forestry and LCT4 Coastal Farmland owing to the low sensitivity of LCT10 and the small extent affected of this LCT, and the localised effect on only one feature of LCT4, namely the distant skyline. All other key characteristics of these LCTs are considered unaffected by the proposed development.

6.8.21 It is noted there are no additional cumulative effects for baseline scenarios 2 and 3, consented and proposed developments. In the cases of LCT11 Open Rolling Uplands and MN10 Open Uplands, the overall level of effect is considered to diminish for scenarios 2 and 3, owing to the prominence of the Cairn Duhie proposed development which, it is considered provides some mitigation for any potential landscape change experienced as a result of the introduction of the proposed Paul's Hill II Wind Farm as potential visibility and landscape change as a result of the presence of Cairn Duhie are considered of greater effect than any experienced as a result of the proposed development. .

6.8.22 LCT10 Upland Moorland and Forestry would experience a reduction in landscape effect for both scenarios 2 and 3 as a result of the prominence of the consented Meikle Hill which would form a dominating feature in this LCT and mitigate potential landscape change as a result of the introduction of the proposed Paul's Hill II Wind Farm, as potential visibility and landscape change as a result of the presence of Meikle Hill are considered of greater effect than any experienced as a result of the proposed development.

6.8.23 The prominence of other developments also resulted in a reduction in overall magnitude of landscape change for LCT12a Open Uplands with Steep Slopes, LCT5a Rolling Farmlands and Forest and Valleys and Area 4 of CNG2: Cairngorm Uplands and Glens but the high landscape value of these LCTs/LCAs resulted in the overall landscape effect remaining as previously assessed.

6.8.24 No unacceptable significant effects are predicted to be experienced by any of the landscape character receptors.

Effect on Landscape Designations

6.8.25 The 3 Landscape Designations that were identified as requiring further detailed assessment are fully assessed below. The determination of the value and susceptibility and therefore overall sensitivity of each landscape receptor is detailed in these tables as part of the LIA assessment.

6.8.26 Equally the criteria for assessing the magnitude of the proposed change and consequent level of landscape effects are contained in the following tables and consider individual effects on the special qualities of these designations.

The Cairngorms National Park

6.8.27 The key Special Qualities of the CNP are identified in *'The special landscape qualities of the Cairngorms National Park*.' Scottish Natural Heritage and Cairngorms National Park Authority (2010). (Scottish Natural Heritage Commissioned Report, No.375) and listed in Table 6.5. Each Special Quality has been assessed for significant effects which are displayed in Table 6.19 below.

Table 6.19: The Cairngorms National Park: Effects on Special Qualities

Special Quality	Potential Landscape Change
Magnificent mountains towering over moorland, forest and strath	No change owing to the internal focus of this Special Quality;
Vastness of space, scale and height	The vast spaciousness of the CNP is not affected and the nearest experience of the proposed turbines is from a distance of 6.7 km. This is sufficiently removed from the receptor so as not to significantly affect perceptions of scale and height;
Strong juxtaposition of contrasting landscapes	These contrasting landscapes refer to the peaks and dips of the landform amongst the uplands and Glens, at their most distinctive within the core areas of the CNP over 20 km away. The proposed development does not significantly affect this internal quality;
A landscape of layers, from inhabited strath to remote, uninhabited upland	This is a vertical (as well as historical) stratification, largely based on vegetation diversity, particularly experienced from the more elevated parts of the CNP looking down into the adjacent valley landscapes resulting in no change as a result of the separation from the proposed development which does not play a part in this localised experience;
The harmony of complicated curves	No change owing to the internal focus of this Special Quality;
Landscapes both cultural and natural	No change owing to the internal focus of this Special Quality and strong perceptual qualities that are unaffected because of the separation of the proposed development;
The unifying presence of the central mountains	Located over 30 km from the proposed development with no significant effects owing to distance;
An imposing massif of strong dramatic character	Located over 30 km from the proposed development with no significant effects owing to distance;
The unique plateaux of vast scale, distinctive landforms and exposed, boulder-strewn high ground	Generally located within the core of the CNP where the 'top of the world feeling of freedom is experienced in the more remote areas of the CNP located over 30 km from the proposed development with no significant effects and therefore the extensive plateaux (or 'true summit' of the Cairngorm mountains are well separated from the proposed development. Some of the distinctive 'boulder

Special Quality	Potential Landscape Change
	strewn high ground' special qualities can appear in the northern hills closer to the proposed development but still located over 6 km away. These distinctive features draw the attention rather than any glimpsed view of the proposed development and, resulting in no significant effects on these special qualities;
The surrounding hills	Refer to the 'lesser hills' within the park which tend to be heather-covered, smooth and rounded, albeit with sudden unexpected crags, screes, gullies and glens. They contribute significantly to the wild, untamed appearance of the area, and many are easily accessible from the main roads. These hills provide a strong context for the central massif hills and plateaux and this connection will not be broken by the proposed development which is located far to the north.
The drama of deep corries	The northern corries of Cairn Gorm and Braeriach and the dark headwalls of Lochnagar corries are located outwith the 40 km study area with no significant effects owing to distance and also no change owing to the internal focus of this Special Quality;
Exceptional glacial landforms	No change owing to the internal focus of this Special Quality and the distinctiveness of these features which draw the attention rather than any glimpsed view of the proposed development;
Snowscapes	These create a sense of wonder when they occur as snow cover adds to the impressiveness and grandeur of the mountains and form a strong internal focus resulting in no significant effects on this quality;
Extensive moorland, linking the farmland, woodland and the high tops	Vast stretches of moorland characterise the Park, and it is probably the best place in the world to experience the distinctive browns and purples of swathes of heather. In late summer, the heather in full bloom is symbolic of the Scottish Highlands. The matrix of heather unifies the landscape elements of the whole Park, occurring throughout and linking the farmland, woodlands and the high tops. No change owing to the internal focus and connections which would remain unaffected as the proposed development is well separated and does not interrupt this internal connection;
A patchwork of muirburn	No change owing to the internal focus and localised nature of this Special Quality which provides a distinctive patchwork of diverse colours;
Steep glens and high passes	Long glens are frequent within the National Park, each emerging from the high mountains. They are steep-sided, with their slopes ending abruptly on a flat valley floor with very little if any theoretical visibility of the proposed

Special Quality	Potential Landscape Change
	development. Many are linked by spectacular upland passes, the most famous being Drumochter, The Lecht, Glenshee and the Lairig Ghru. Some glens contain remnants of Caledonian pinewood, and some are remote and uninhabited. In the latter case, the remains of long abandoned settlements, farms or shooting lodges are sometimes visible. These localised landscape features are well separated from the proposed development which does not play a part in this localised internal Park experience;
Broad, farmed straths	Known as the main arteries of the Park forming natural transport corridors. Their slopes contain pockets of native woodland, rough grazing, heather moor and plantation forest and localised roadside vegetation adds to the mix of screening to focus visibility to immediate surroundings rather than any glimpsed distant views in the northerly direction toward the proposed development. Found throughout the CNP of which Lower Strathspey LCAs are good examples, where visibility is limited to the less accessed upper side slopes, often forested. No significant effects on these sections of Straths as identified in initial landscape character assessment of effects in Appendix A6.3. This is the closest Strath with other examples such as Strath Avon showing extremely limited visibility of the proposed development and located 10.5 km away;
Renowned rivers	The Cairngorms National Park is home to some of the best known Scottish rivers, such as the Spey, Don and Dee. The journey upstream from strath to river source, through highland glen and upland burn to the snows of the corrie or plateau, encapsulates the diverse landscape qualities of the Park. The main experience of this journey is from within the Park although the Spey does pass to the south of the Open rolling upland containing the proposed development. Any effect on this stretch of the Spey is highly localised and does not affect the overall journey of this river or its special connection with the Park landscapes it passes through;
Beautiful lochs	Lochs and lochans are not common in the Park and where present are internal Park qualities unaffected by the well separated proposed development;
Dark and venerable pine forest	No change owing to the internal focus of the Special Quality of these tracts of ancient Scots Pine;
Light and airy birch woods	In many areas birch woods provide a lighter and more open contrast to the darker pines. No change owing to

Special Quality	Potential Landscape Change
	the internal focus of the Special Quality of this juxtaposition;
Parkland and policy woodlands	Particularly found in the Blair Atholl and Deeside areas, well separated from the proposed development but with a strong inward looking focus, resulting in no change;
Long association with forestry	There is a long legacy of managed forests, logging and forest industries which continues to this day. This legacy includes remnants of log dams, iron furnaces, saw mills and tramways, as well as numerous modern plantations. It also includes the continuing tradition of timber cladding, wooden porches and wooden outbuildings. No effect on these localised, internal Park Special Qualities.
Dominance of natural landforms	Remains unaffected owing to the dominance of this Special Quality and the separation of the proposed development;
Extensive tracts of natural vegetation	No change owing to the internal focus and localised nature of this Special Quality;
Association with iconic animals	The Park landscape is associated in many people's minds with iconic Highland wildlife such as golden eagle, osprey, red grouse, capercaillie, ptarmigan, wildcat, red squirrel, pine marten, red deer and salmon. No change owing to the internal focus and localised nature of this Special Quality;
Wild land	The mountain core contains some of the wildest and remotest areas of Britain, where the vegetation is natural, artefacts are rare, nature is in charge, and the long walk-in is the only means of getting there. These central areas are located over 30 km from the proposed development with no significant effects owing to distance;
Wildness	Other areas of the Park are less remote, but the preponderance of near natural vegetation, together with distinctive wildlife and the general lack of development, can still give a perception of the dominance of nature. This includes the managed grouse moors, which are well separated from the proposed development and visual receptors on these moors are engaged in sporting activities and unaffected by significant effects. It also includes the ancient, managed woods and plantations which are inward looking and unaffected by the proposed development.
Layers of receding ridge lines	It is a landscape of receding and interlocking layers, comprising a series of gently undulating and ascending ridge lines visible when looking across to distant horizons. In hazy light, these appear as hues of decreasing intensity, giving great depth to the landscape. Where ridges are not broken by human structures, the

Special Quality	Potential Landscape Change
	receding horizons reinforce the impression of natural landforms dominating. This impression is retained for southern views and for localised northern views which may contain the proposed development as a distant, glimpsed element, no significant effects are predicted;
Grand panoramas and framed views	Vast and distant panoramic views are frequent throughout the Park with eastern, southern and western views remaining unaffected and only northern views experiencing the proposed development as a distant, glimpsed element with no significant effects predicted;
A landscape of many colours	The Park however possesses characteristics which make its colours distinctive and recognisable. These include the distinctive dark green canopy and orange bark of Scots pine; the hillside patchworks of muirburn with its various subtle hues; the brilliant white snow fields and snow patches; the lochs nestled in woodland brightly reflecting the sky; the pink granite sparkling in a sharp winter sun; and the cloak of purple heather in late summer. No change owing to the internal focus of this Special Quality;
Dark skies	Would remain unaffected by the proposed development which would not be subject to aviation lighting.
Attractive and contrasting textures	As with colour, the landscape displays a myriad of attractive and contrasting textures specific to the area. This occurs at both the small scale, for example the rough, platy bark of pine with a soft heap of wood ant nest beneath; and at the large scale, such as the rolling hills of soft heather. In between, there are gritty plateaux; sheer, hard crags; rock outcrops in soft moorland; smooth pastoral grasslands; rough rivers churning over rounded pebbles; and serene, shiny loch surfaces. No change owing to the internal focus of this Special Quality;
The dominance of natural sounds	The Special Quality of the 'deep and primitive' silence would remain unaffected as the proposed development is well separated from the Park with no significant noise effects on the area of the Park.
Distinctive planned towns	No change owing to the internal focus of this Special Quality of vernacular architecture, materials and layout;
Vernacular stone buildings	No change owing to the internal focus of this Special Quality;
Dramatic, historical routes	The main roads still follow old routes through the dramatic, wild scenery of the high passes of Glenshee, The Lecht and Drumochter, following the line of the 18th century military roads. These passes provide a sense of anticipation during the ascent and during the descent the splendid Cairngorms' landscape comes into view, giving

Special Quality	Potential Landscape Change
	a sense of arrival once traversed, and also a sense of security on reaching habitation. Other traditional routes such as the Lairig Ghru, Glen Feshie, Glen Tilt, Glen Dee, Jock's Road and the Gaick Pass are now the domain of the hillwalker. Very little if any theoretical visibility from these routes, no significant effects owing to the perceptual aspect of the Special Quality involved in the journey being the key to this quality and remaining unaffected by the proposed development;
The wistfulness of abandoned settlements	These ruins form part of the Park character and provide points of reference for the visitor which are internal Park focal points and unaffected by the proposed development;
Focal cultural landmarks of castles, distilleries and bridges	These landmarks form part of the Park character and provide points of reference for the visitor which are internal Park focal points and unaffected by the proposed development;
The Royal connection	No change owing to the internal focus of this Special Quality;
A landscape of opportunities	Scenery plays a key role in the many recreational opportunities available within the Park. Any glimpsed visibility of the proposed development is, at its closest, 6.7 km from the northern boundary receptors of the Park, and here a southern facing view takes in the distant grandeur of the Park which draws the attention far more than the gentle northern uplands containing the proposed development. No significant effects are predicted.
Spirituality	No change to this Special Quality as it is generally associated with the more remote areas, that are well separated from the proposed development;

Source: Source: Scottish Natural Heritage and Cairngorms National Park Authority (2010). The special landscape qualities of the Cairngorms National Park. Scottish Natural Heritage Commissioned Report, No.375 (iBids and Project no 648).

6.8.28 No Special Qualities are considered to experience significant effects as a result of the proposed Paul's Hill II Wind Farm development, generally owing to the separation of the proposed development from the Park, being located 6.7 km to the north and away from key experiences of the park, concentrated on southern views. In addition, many of the Special Qualities are identified as internal Park features with a strong localised emphasis and experience which would not be affected by features located outwith the Park.

6.8.29 A full assessment of potential effects on the Park as a whole is displayed in the following table;

Table 6.20: Assessment of potential effects on the CNP

The Cairngorms National Park
Location
Located in the southern part of the proposed Paul's Hill II Wind Farm study area, 6.7 km at its closest northern point from the proposed development.
Sensitivity
Landscape Value: ***High***. National designation, exhibits high level scenic qualities and is in good and well managed condition. The perceptual qualities of wildness and naturalness are high, particularly in the core areas with a high level of recreational, conservation and cultural value. *Landscape Susceptibility:* ***High***. This designation is large in scale and geographical extent with mixed open character amidst the uplands and enclosed character amidst the Straths with a complex character in places and a distinctive and variable landform. Parts of the CNP are strongly inter-visible with neighbouring areas forming a strong visual backdrop and undeveloped skyline. It retains high perceptual qualities due to the long views possible across the CNP and neighbouring valley landscapes. An overall High level of susceptibility to the type of development proposed but some elements of character including its large scale and openness reduce this high level in places to a more medium-high level of susceptibility. *Overall Landscape Sensitivity:* ***High*** sensitivity
Existing characteristics and experience (including cumulative Baseline 1)
This is a large scale landscape with a range of high rising summits and deeply incised river valleys with panoramic views southwards across the CNP core and the Cairngorm massif. The special Qualities listed in Table 6.5 and Table 6.19 detail the characteristics of this designation. The sample Viewpoint 5 is taken from the northern boundary of this designation, from the summit of Carn a Ghille Chearr, is illustrated in Figure 6.13e and indicates the long views across the impressive topography of the CNP to the south and the Broad Spey Farmed Valley and background hills of LCT11 containing the proposed development to the north which borders the CNP. Theoretical visibility of operational wind farm developments is shown in the scenario 1 cumulative ZTV in Figure 6.13h. Operational developments are visible from the summits and western side slopes of the Cromdale Hills and the lower slopes of the eastern bank of the River Spey including some patches of visibility along the B970 road route. High points to the west of Aviemore and Grantown also experience visibility as do some high points within the Ladder Hills. Figures 6.13a-c indicate that visibility of Hill of Towie operational development is restricted to high points south of Tomintoul and occasional northern summits from the Ladder Hills. Visibility of Rothes I, II and Berryburn is also restricted to summit locations in the Cromdale, Ladder Hills and the core summits around Cairn Gorm. Visibility of Paul's Hill I is also experienced from these high points but extends onto the lower slopes of the Strathspey landscapes. The eastern slopes of the Cromdale Hills currently experience no visibility of operational turbines.
Predicted experience of proposed development (including cumulative baseline 1)
The ZTV in Figure 6.1 shows intermittent partial visibility of 2-4 turbines from along the A95 main Spey Valley road route and larger patches of visibility of up to 6 turbine nacelles across the north-west facing upper slopes of the Hills of Cromdale and the Ladder Hills in the north-east of the NP. Several patches of visibility occur from across the high points of the extensive interior plateau including and to the north of the Cairngorm massif. Up to 6 turbine nacelles would be theoretically visible from high points to the north-west such as Carn Bheadhair and around Bynack Beg and Bynack More rocky ridge and there is scattered partial visibility of up to 6 turbine nacelles from the north facing slopes of Cairn Gorm summit and southern spurs overlooking the Lairig Ghru pass which has no visibility. There are patches of visibility further east at the edge of the study area, around the Tors of Ben Avon, the summits of Stob an t-Sluichd, Stob Bac an Fhurain and the high point of Ben Avon, Leabaidh an Daimh Bhuidhe. Distant hubs and blade tips of the proposed development would be theoretically visible from the Ben Avon summit within this high-level plateau resulting in a barely perceptible change from this distant location. Key experiences of solitude and naturalness are focused around the impressive glacial features of the interior plateaux and barely perceptible changes to the distant northern skyline would not significantly affect these special qualities. In addition, the special qualities of the NSA

representing the core landscape of the NP, have no link or association with the open moorland containing the proposed development, owing to the distance separating the two landscapes and the intervening contextual landscapes consisting of the glens and straths and the dramatic glacial landforms. Overall, there is very little additional extent of visibility of the proposed Paul's Hill II Wind Farm where there was no visibility before of operational developments. This can be seen in Figure 6.13a-c, and includes patches of partial visibility from the lower side slopes of the eastern bank of the Spey Valley such as around Cromdale and east of Boat of Garten. In reality existing forestry and woodland reduces such theoretical visibility and the valley bottoms of these sensitive straths remain unaffected and distance substantially mitigates any potential change. Additional visibility of Paul's Hill II proposed turbines is theoretically possible mainly along the B970 road route where visibility of the proposed turbines would extend visibility of turbine development down to the lower slopes of the Speyside landscapes. However, in reality as demonstrated by SEQVP01, SEQVP02 and SEQVP03 (Figures 6.15a-c), the theoretical visibility consists of 2-4 blade tips from distant locations and intervening vegetation along these wooded straths further mitigates such effects to barely perceptible changes. The sample VP5 Carn a Ghille Chearr, Figure 6.14e, shows the potential change in view with turbines appearing around Roy's Hill and appearing larger in size and closer to the viewer to the operational Paul's Hill and Berryburn turbines. The proposed turbines also increase the horizontal spread of the overall Paul's Hill development, producing an extended development focussed behind the landform of Roy's Hill. However, from this elevated viewpoint, the prominence of Roy's Hill as an elevated feature is substantially reduced as it blends into the rolling uplands on the other side of the Spey Valley from the viewer. From this perspective, the Paul's Hill extended development therefore appears to settle well within these uplands and is mostly backclothed against the retreating landform. VP5 also represents one of the closest views of the proposed development from the CNP. Overall, the openness of the view is retained and southern key views across the key elements of the CNP remain unaffected.

Predicted cumulative experience of proposed development with cumulative baseline scenarios 2 & 3

As demonstrated by Cumulative ZTVs Figures 6.11c-k, very little combined visibility occurs with the proposed development and the consented Dorenell development, restricted to high points such as Meall a Bhuachaille, the northern Ladder Hills, Cairn Gorm and Bynack More. The consented Dorenell itself adds visibility to the eastern Cromdale slopes and central areas around Tomintoul where no visibility of the proposed Paul's Hill II development occurs. Combined visibility with the proposed development and Clashindarroch is extremely restricted to 2 summit locations. Limited combined visibility occurs with the proposed development and the consented developments of Meikle Hill and Kellas, restricted to Cromdale summits, Ladder Hills and distant Cairn Gorm summit and combined visibility with Hill of Glaschyle is also extremely restricted to southern summit locations. The presence of Cairn Duhie would increase the extent of visibility from the western slopes of the Cromdale Hills, infilling gaps in visibility of operational developments. These newly extended areas have no visibility of the proposed development. Where visible together, the Dorenell consented turbines appear in successive views to the proposed development as seen in Figure 6.13e and the other scenario 2 developments would also be experienced as well separated developments from the proposed Paul's Hill II Wind Farm. The proposed development would increase development on the northern skyline but would not considerably extend the horizontal spread of turbines, being seen in the context of Paul's Hill I turbines.

The scenario 3 proposed Dorenell Variation and Extension would increase turbine visibility in addition to scenario 2 developments to the lower eastern slopes of the Cromdale Hills. These newly extended areas have no visibility of the proposed development. Further into the NP, combined visibility with the proposed development and scenario 3 developments is extremely limited to southern summits.

Magnitude of Landscape Change

Geographical Extent: ***Small.*** Limited visibility across the whole CNP, restricted to summits and distant, partial barely perceptible visibility from lower slopes of Speyside Strath landscapes.

The Cairngorms National Park

Size and Scale: ***Minor***. Actual visibility restricted to partial visibility even from summit landscapes and the experience of the proposed development mostly in the context of an extension to the visible operational Paul's Hill I turbines.

Duration and Reversibility: ***Long*** term theoretically ***reversible*** change

Overall Magnitude of landscape change: ***Moderate.*** Magnitude of landscape change causing a partial alteration to north-western skylines. The underlying character and Special qualities of the CNP would remain unaffected with perceptual value or remoteness remaining high due to long internal views and appreciation of the key landscape features within the Park remaining unaffected.

Magnitude of Cumulative Landscape Change

Moderate magnitude of Cumulative Change in respect of the existing/consented developments (scenario 1). Remains ***Moderate*** for scenario 2 and 3 owing to the landscape fit of the proposed Paul's Hill II Wind Farm into the existing Paul's Hill array and the very limited combined visibility of the proposed development with scenario 2 and 3 developments.

Landscape Effect

Moderate and considered ***Not Significant*** across the CNP as a whole. The high value of the CNP and extent of visibility determine a moderate level of landscape effect but this is considered not significant as the visibility would be experienced in the context of the operational development of Paul's Hill and key special qualities would remain unaffected as detailed in Table 6.19

Cumulative Landscape Effect

Moderate and ***Not significant*** for scenario 1 developments. No additional cumulative landscape effect over and above that predicted in the LVIA for scenarios 2 and 3.

Drynachan, Lochindorb and Dava Moors SLA

6.8.30 The key Special Qualities of the SLA are identified in *'Assessment of Highland Special Landscape Areas'* (SNH, M. Wood, Horner & Maclennan, 2011) and listed in Table 6.21. Each Special Quality has been assessed for significant effects which are displayed in the table below.

Table 6.21: Drynachan, Lochindorb and Dava Moors SLA: Effects on Special Qualities

Special Quality	Potential Landscape Change
Expansive views and broad panoramas across open, rolling moorland and vast skies instil a boundless sense of scale and space, enhanced by the consistency of moorland cover and landform character;	The expansive views and broad panoramas would remain unaffected by the proposed development, which if visible would be experienced in the context of operational developments of greater horizontal spread than the proposed development which occupies a narrow angle of view from the few locations where it is largely partially visible. Moorland cover and internal landform would remain unaffected by the proposed development as these are strongly internal SLA features and Qualities.
A narrow, deep section of the Findhorn River Valley at Streens offers enclosed and intimate relief in contrast to the elevated and exposed	As shown in Figure 6.1: ZTV, there is no visibility from within this enclosed and intimate incised river valley resulting in no significant effect on this Special Quality;

Special Quality	Potential Landscape Change
moorland. Elsewhere, valleys frame views to Lochindorb;	
Land management practices create distinctive abstract muirburn patterns, accentuated by ever-changing weather and light patterns;	No change to these strongly internal SLA Special Qualities;
The limited extent of tree cover and human habitation creates a simple yet powerful moorland image of tranquillity, simplicity and isolation which is emphasized by Lochindorb and its ruined castle;	As shown in Figure 6.1: ZTV, there is no visibility from the ruined Castle at Lochindorb or from the unclassified road passing through this tranquil landscape. Partial theoretical visibility of up to 4 turbine nacelles only is restricted to the less accessed summit tops of Craig Tiribeg and Carn a Cheatraimh Mhoir located to the east and north of Lochindorb. Limited partial visibility from a distance of 14.4 km from the proposed development is considered not to experience significant visual or landscape effects. No significant effects on the perceptual qualities of tranquillity, simplicity and isolation due to the continued experience of these qualities from the sensitive Lochindorb loch side and Moidach More and Dava Moor areas which show very little visibility and no additional visibility of the proposed development in addition to the operational Paul's Hill and Berryburn developments;
Where buildings exist, these are of a distinctive estate character. Also building remains from pre clearance farmsteads, with enclosures, head dykes and associated field systems and improved land form one of the few built and 'managed' elements within the landscape. These engender a strong atmosphere which can arouse contemplative emotions of past human endeavour and hardship;	No change to these strongly internal SLA Special Qualities;
The long, fairly straight routes through this landscape allow an easy appreciation of the openness and simplicity of the landscape. These are typically lined with permanent snow poles which serve to reinforce the impression that this is a landscape exposed to adverse weather.	As shown in Figure 6.1, there is very limited visibility and generally only partial visibility of up to 2 turbine nacelles from the minor roads traversing the SLA resulting in no significant effects on them or thoseperceptual Special Qualities experienced while travelling along them such as the impression of exposure to adverse weather.

Source: 'Assessment of Highland Special Landscape Areas' (SNH, M. Wood, Horner & Maclennan, 2011)

6.8.31 No Special Qualities are considered to experience significant effects as a result of the proposed Paul's Hill II Wind Farm development, generally owing to the limited partial visibility of the proposed development and the visual and physical separation provided between the SLA and the proposed development by the Carn Kitty ridgeline to the west of the proposed development. Key sensitive areas within the SLA including Lochindorb shoreline, Moidach More and Dava Moor and he Dava Way long distance walking route remain unaffected by the proposed development. Overall, it is considered the 3 key Special Qualities comprising a sense of solitude, views over the heather moorland and the big skies will not experience significant effects as a result of the proposed development for the reasons cited above, together with some of the Special Qualities being identified as internal SLA features with a strong localised emphasis and experience which would not be affected by features located outwith the SLA.

6.8.32 A full assessment of potential effects on the SLA as a whole is displayed in the following table;

Table 6.22: Assessment of potential effects on the Drynachan, Lochindorb and Dava Moors SLA

Drynachan, Lochindorb and Dava Moors SLA
Location
Located in the Highland Council Administrative Area, between the rolling uplands containing the proposed development and the A9, to the north of Grantown-on-Spey. It lies 1.8km immediately to the west of the proposed Paul's Hill II Wind Farm study area at its closest point. This area covers most of the higher moorland which separates the Cawdor-Ferness-Beachans area of the Nairn district from Strathspey to the south and the route of the A9 to the west. It incorporates the continuous moors of Drynachan, Lochindorb and Dava and extends from Carn nan Tri-tighearnan in the west to Lang Hill and Carn Kitty in the east.
Sensitivity
Landscape Value: ***Medium***. This LCA is covered by the local landscape designation of the Highland Council Special Landscape Area, Cairngorms National Park, exhibits high level scenic qualities and is in a relatively good condition. The perceptual qualities of remoteness are High. *Landscape Susceptibility:* ***Medium***. This LCT is large in scale and geographical extent with an open character, simple pattern and land cover and a gentle topography amidst the plateau landform occasional distinctive landscape features. It is inter-visible with neighbouring character areas and forms a strong visual backdrop mainly from the A9 corridor. It retains high perceptual qualities. *Overall Landscape Sensitivity:* ***Medium*** sensitivity.
Existing characteristics and experience (including cumulative baseline 1)
This landscape comprises high rolling moorland, largely managed as grouse moor with gentle gradients and limited relief. Set amidst numerous settlements, the SLA is experienced and appreciated from several public roads traversing the area. Its key characteristics are the homogeneity of this area, its sense of spaciousness, wide views, and sparse human presence. It retains a strong sense of tranquillity as well as some wildness qualities, which are emphasised by an almost complete absence of built structures. The central feature of Lochindorb and the ruined castle in the centre of the Loch add to the perceptual qualities linked to the heritage value of the SLA. As shown in Cumulative ZTVs Figures 6.13a-c and h, there is extensive theoretical visibility of the operational Berryburn and Paul's Hill I developments, which are located to the north and east of the SLA. Theoretical visibility of both developments occurs across the eastern ridgelines around Larig Hill and visibility of Berryburn only occurs across the southern end of Moidach More to the east of the Dava Way, with a limited stretch of visibility of Berryburn from along the Dava Way itself. Visibility of both developments continues westwards from the east facing high points of the plateau including isolated patches of visibility from along the A940 and the B9007. Distant visibility of the operational Hill of Towie is restricted to the eastern ridgelines around Larig Hill and theoretical visibility of Rothes I development is restricted to the north-western plateau high point to the west of the incised Findhorn Valley. Some visibility of the operational Berryburn development exists from stretches of the minor Lochindorb road which connects the A940 and the B9007 and from the central part of the Loch containing the castle ruin, with visibility of the operational Paul's Hill I development restricted to the northern summits visually containing the bowl shaped landform containing the Loch. The current experience is a mix of undeveloped moorland with areas where operational wind farm developments are visible.
Predicted experience of proposed development (including cumulative baseline 1)
The SLA is located 2km to the west of the proposed development at its closest point. The ZTV shows visibility from the east facing slopes of the relatively inaccessible moorland to the south of Berryburn Wind Farm and within 4km of the proposed development. Visibility from the core landscape around Lochindorb is restricted to

Drynachan, Lochindorb and Dava Moors SLA

the containing summits surrounding the Loch. Large patches of partial visibility of between 2-6 turbine nacelles are located further west into the SLA, from east facing upper slopes and summits on both sides of the incised Findhorn Valley. As shown in Figure 6.13h, within the boundary of the SLA, there is no additional extent of visibility of the proposed Paul's Hill II Wind Farm development where there was no visibility of operational turbines before. Theoretical visibility of the proposed development occurs to the west of the Paul's Hill I turbines from east of Larig Hill but the ridgelines of Carn Kitty and Carn na Loine prevent further western views from the southern end of Moidach More where only the operational Berryburn development is visible from this sensitive area. There is no visibility of the proposed development from along the Dava Way. Theoretical visibility of the proposed development from around the sensitive landscape feature of Lochindorb and its ruined castle are restricted to the eastern and northern containing summits of Craig Tiribeg and Carn a Cheataimh Mhoir and Hill of Aitnoch where partial visibility of between 3-4 turbine tips would be visible from the summits. A short stretch of 450m from a high point along the B9007 indicates theoretical visibility of 1 blade tip but in reality this would be barely perceptible owing to the more extensive visibility of the Berryburn development. As the plateau moorland once again increases in height heading westwards throughout the SLA small patches of theoretical visibility of all 7 blade tips and up to 3 hubs would be visible from the very highest east facing summits and upper slopes such as Carn nan Tri-tighearnan, Carn Odhar and Carn a Mhais Leathain in the north-western section of the SLA to the west of the incised Findhorn Valley. From this area, the proposed development would be visible in the context of the operational Paul's Hill I and Berryburn Wind Farms located 'in front' of the proposed development as seen by the viewer.

Predicted Cumulative experience of proposed development with cumulative baseline scenarios 2 & 3

As demonstrated by Cumulative ZTVs Figures 6.11c-f, the theoretical visibility of the proposed Paul's Hill II development largely overlaps with the ZTVs of the scenario 2 consented wind farm developments of Meikle Hill, Kellas, Hill of Towie II, Hill of Glaschyle and Dorenell with small patches of visibility of the proposed development where no scenario 2 development would be visible, but scenario 1 operational developments would be visible in conjunction with the proposed development in these areas. Where visible together such as from the high points of the plateau, the proposed development would be viewed much more in the context of the operational Paul's Hill I and Berryburn developments and would also appear 'behind' these existing developments and this grouping would appear as a separate turbine cluster to those introduced in the scenario 2 baseline, owing to the geographical separation of the proposed development from the scenario 2 developments. The presence of the consented Scenario 2 Cairn Duhie development however, which is to be located 1.7 km to the north of the SLA boundary at Aitnoch, would have very little combined visibility with the operational developments, scenario 2 developments and the proposed development but would have extensive visibility on its own across the designation. Cairn Duhie would be visible from the entire length of the A940 and the Dava Way throughout and to the north of the SLA and extend visibility further across Moidach More and Carn Mor, west of Lochindorb, largely infilling gaps in the visibility of operational developments. These newly extended areas have no visibility of the proposed development.

The scenario 3 proposed Dorenell Variation and Extension would only slightly increase turbine visibility in addition to scenario 2 developments, extending visibility further along ridgelines or down onto lower slopes. These newly extended areas have no visibility of the proposed development.

Magnitude of Landscape Change

Geographical Extent: ***Medium.*** Although nearly only visible as partial visibility throughout the SLA, the overall extent of theoretical visibility of the proposed development from unscreened summits and ridgeline high points throughout the plateau moorland has been considered to be of medium extent.

Size and Scale: ***Minor***. Considered minor owing to the mostly partial visibility of the proposed development throughout the SLA, with the exception of 7 hubs visible only from the highly localised and adjacent areas around Larig Hill. Any visibility of the proposed development from the SLA would be seen in the context of,

Drynachan, Lochindorb and Dava Moors SLA

and 'behind' the operational turbine cluster of Paul's Hill I and Berryburn turbines. The proposed development would also not increase the horizontal extension of the Paul's Hill array but would slightly increase the overall 'depth' of development but would still be viewed as a logical extension to the existing Paul's Hill I Wind Farm. Potential landscape change would be further mitigated with distance further west into the SLA. As no new areas of visibility would be opened up as a result of the proposed development the existing special qualities and characteristics of the SLA would remain largely unchanged and in addition, the most highly sensitivity landscape areas of the SLA such as Moidach More, Lochindorb and the experience of the SLA from along the Dava Way would not experience any landscape or visual change as a result of the proposed development.

Duration and Reversibility: ***Long*** term theoretically ***reversible*** change

Overall Magnitude of landscape change: ***Moderate*** Magnitude of landscape change causing a partial alteration to eastern skylines. The underlying character of the SLA would remain unaffected with perceptual value remaining high.

Magnitude of Cumulative Landscape Change

Moderate magnitude of Cumulative Change in respect of the existing/consented developments (scenario 1). Reduces to ***Slight*** for scenario 3 owing to the introduction of the prominent new feature of Cairn Duhie to the north of the SLA in close proximity to publicly accessible areas which mitigates change resulting from the introduction of Paul's Hill II Wind Farm. Remains ***Slight*** for scenario 3.

Landscape Effect

Moderate and ***not significant*** across the SLA as a whole but some localised moderate significant effects possible from Hill of Larig from within 2 km of the proposed development in the relatively inaccessible Glen Gheallaidh. Considered a not significant overall landscape effect for the SLA as a whole, owing to the experience of the proposed wind farm development in the context of operational turbines and the retention of key characteristics and features of the SLA which remain largely unaffected.

Cumulative Landscape Effect

Moderate and ***Not significant*** for scenario 1 developments. Cumulative landscape effect reduces to ***Minor*** and ***Not significant*** for scenario 2 and remains ***Minor*** and ***Not significant*** for scenario 3.

Spey Valley AGLV

6.8.33 The Spey Valley AGLV overlaps with the CNP. In the absence of specific citation documents for this designation, the key characteristics, identified in the MWELCS 2017 for the relevant LCTs which cover the designation and are listed in Section 23 were analysed and compared to the Special Qualities already identified for the southern part of the AGLV which lies within the CNP. It is considered that the CNP Special Qualities equally apply to the northern section of the Spey Valley AGLV which lies adjacent to the CNP as it shares many characteristics and qualities with the Strathspey landscapes within the CNP.

6.8.34 The potential effects of the proposed development on the Special Qualities of the CNP have already been assessed in section 6.8.27, and this assessment applies equally to the assessment of effects on the Special Qualities of the Spey Valley AGLV and should be referred to for assessment of effects on the Special Qualities of the Spey Valley AGLV.

6.8.35 Although located closer to the proposed development than the CNP, theoretical visibility of the proposed development is substantially reduced for actual visibility, owing to the diversity of tree cover throughout the northern part of the AGLV. In addition, the AGLV is a vast designation with many areas exhibiting the Special Qualities that would experience no visibility and no effects of the proposed development. It is therefore considered that no AGLV Special Qualities would experience significant effects as a result of the proposed Paul's Hill II Wind Farm development, generally owing to the limited actual visibility and many of the Special Qualities are identified as

internal AGLV features with a strong localised emphasis and experience which would not be affected by features located outwith the AGLV.

6.8.36 A full assessment of potential effects on the AGLV as a whole is displayed in the following table;

Table 6.23: Assessment of potential effects on the Spey Valley AGLV

Spey Valley AGLV
Location
Located within the central part of the study area, partially overlapping with the CNP and located 3.9 km at its closest point from the proposed development. An extensive designation stretching from Inchberry in the north, widening out to include the open uplands with steep slopes and settled glens landscapes including Glen Rinnes and surrounding ridgelines and extending into the CNP to include the Glen Livet Glens and Straths landscapes, the North Eastern Hills, the Cromdale Hills and the Cairngorms central massif.
Sensitivity
Landscape Value: ***High***. The AGLV is a local landscape designation but also overlaps with the National CNP designation, it exhibits a high level of scenic qualities and is in good condition. The perceptual qualities of naturalness and remoteness are considered to be medium owing to the strong influence of the well settled Spey Valley. A high level of recreational value owing to easy accessibility. *Landscape Susceptibility:* ***Medium***. This AGLV is considered to be medium in scale with a moderately open character and relatively simple, informal pattern. There is a mixed heritage and industrial influence of development and settlement owing to the Whisky industry, experiences medium inter-visibility with surrounding landscapes with mixed outward and inward views owing to the varying elevation and enclosure throughout this AGLV. *Overall Landscape Sensitivity:* ***Medium*** sensitivity
Existing characteristics and experience (including Cumulative Baseline 1)
This is an extensive landscape designation with key characteristics including the relationship between the broad agricultural valley of the Spey River and the containing rolling farmland and steep slopes of the open uplands which shape the south-eastern edge of the valley. The rugged group of outlying Landmark Hills of Ben Rinnes, Meikle Conval and Little Conval are widely visible and form key landscape features within the northern part of this designation. The progression of the designation into the CNP includes the relationship between the Glen Livet landscapes and the Cromdale and North Western Hills and the culmination in the impressive Cairngorm massif are also key components to the overall designation. As shown in Cumulative ZTVs Figures a-c, the visibility of operational wind farm developments of Paul's Hill I and Berryburn largely overlap and mainly occur from the north-western slopes of Ben Rinnes and the northern facing slopes of the Ladder Hill within the North-Eastern Hills upland LCA. Rothes I Wind Farm extends the visibility of operational turbines as does the Hill of Towie development which is largely stand-alone theoretical visibility not in conjunction with other operational development from the north eastern part of the designation, largely outwith the CNP. The large extent of the designation results in a great variation of distance from the proposed development, from almost 4 km to 38 km at the southern end of the designation, where theoretical visibility of all operational developments occurs from the north facing slopes of Ben Avon and Cairn Gorm. Viewpoint 3 Ben Rinnes, (Figure 6.14c) indicates the existing visibility of the operational developments, where Hill of Towie and Clashindarroch are well separated from the Berryburn and Paul's Hill I development cluster.
Predicted experience of proposed development (including cumulative baseline 1)
Example Viewpoint 3 Ben Rinnes shows the change in view with turbines appearing around Roy's Hill and moving closer to the viewer, appearing larger in size to the operational Paul's Hill and Berryburn turbines, which they are. The proposed turbines also increase the depth of the overall Paul's Hill development and extends the horizontal spread, producing an extended development focussed behind the landform of Roy's

Spey Valley AGLV
Hill. However, from this elevated viewpoint, the prominence of Roy's Hill as an elevated feature is substantially reduced as it blends into the rolling uplands on the other side of the Spey Valley from the viewer. From this perspective, the Paul's Hill extended development therefore appears to settle well within these uplands and is entirely backclothed against the retreating landform. Overall, the openness of the view is retained and southern key views across the CNP remain unaffected. As shown in Figure 6.13h, within the Spey Valley AGLV there is no additional extent of visibility of the proposed Paul's Hill II Wind Farm where there was no visibility of operational turbines before, meaning the proposed development would always be seen within the context of the Paul's Hill and/or Berryburn cluster from those limited areas where it is visible throughout the AGLV.
Predicted cumulative experience of proposed development with cumulative baseline scenarios 2 & 3
As demonstrated by Cumulative ZTVs Figures 6.11c-f, the visibility of scenario 2 consented wind farm developments of Meikle Hill, Kellas, and Hill of Glaschyle within this LCT largely overlap with the operational development of Paul's Hill as does the visibility of the proposed Paul's Hill II Wind Farm. Hill of Towie II overlaps largely with Hill of Towie operational wind farm visibility but visibility of the extensive Dorenell consented development would extend operational wind farm visibility to the eastern slopes of this AGLV and as seen in Figure 6.13c, the Dorenell development would be highly visible on the adjacent ridgeline from the key vantage point of Ben Rinnes across the intervening Valley of Glen Rinnes. Dorenell would become a new prominent feature in many views throughout the AGLV, particularly from the northern part of this AGLV. The Scenario 2 Cairn Duhie development is associated with an upland landscape that is well separated from the AGLV with very little additional affect. The scenario 3 proposed Dorenell Variation and Extension would further increase the visible spread and density of operational turbines increasing the prominence of this new landscape feature. There is no additional visibility as a result of Paul's Hill II Wind Farm to that which already occurs as a result of operational, scenario 1 developments. Some limited changes to the composition of such views would occur as detailed above but it is considered key characteristics of the designation remain largely unaffected. Scenario 2 and 3 developments introduce prominent features of Dorenell and Dorenell Extension and Variation in close proximity to the AGLV resulting in further mitigation of landscape change as a result of the introduction of Paul's Hill II Wind Farm.
Magnitude of Landscape Change
Geographical Extent: ***Small.*** It is considered a small area of the overall AGLV is affected. *Size and Scale:* ***Moderate***. The difference in proposed turbine size to those of the operational turbines of Paul's Hill and Berryburn is evident from the areas of visibility of the proposed development highlighting the difference in the relationship between the operational and proposed turbines. This is considered a minor to moderate level of this element of magnitude depending on distance, as views across the AGLV and CNP to the south and east remain unaffected. Equally the key perceptual qualities are not considered to be strongly affected. *Duration and Reversibility:* ***Long*** term theoretically ***reversible*** change *Overall Magnitude of landscape change:* ***Moderate.*** Magnitude of landscape change causing a noticeable alteration to northern backclothed views from Ben Rinnes and other areas of visibility although increased distance from the proposed development such as from the Ladder Hills and as far as Cairn Gorm and Ben Avon would increasingly mitigate overall landscape change. The underlying character of the AGLV would remain unaffected with perceptual and recreational value remaining high and key inter-visibility with southern landscapes and neighbouring Glens remaining unaffected.

Spey Valley AGLV
Magnitude of Cumulative Landscape Change
Moderate magnitude of Cumulative Change in respect of the existing/consented developments (scenario 1). Reduces to ***Slight*** for scenario 2 and 3 owing to the prominence of the consented Dorenell and the scenario 3 proposed Dorenell Extension and Variation which mitigates change resulting from the introduction of Paul's Hill II Wind Farm.
Landscape Effect
Moderate and considered ***Not Significant*** across the AGLV as a whole. The High value of the LCA and moderate size and scale element of the magnitude of potential landscape change determine a moderate level of landscape effect but this is considered not significant as the proposed development would be experienced, particularly from elevated locations within the AGLV, in the context of the operational developments of Paul's Hill and Berryburn.
Cumulative Landscape Effect
Moderate and ***Not significant*** for scenario 1 developments. Cumulative landscape effect remains ***Moderate*** and ***Not significant*** for scenario 2 and 3 although magnitude of cumulative landscape change reduces to Slight for scenarios 2 and 3.

Summary of Effects on Landscape Designations

6.8.37 No Significant landscape effects are considered to occur from any of the three assessed landscape designations within the study area. Moderate and Not Significant levels of landscape effect have been considered for the Cairngorms National Park, The Cairngorm Mountains NSA and the Cairngorms WLA which were included in the initial assessment for significant effects within the Scoping report. Also, no significant levels of landscape effect have been considered for the Drynachan, Lochindorb and Dava Moors SLA and the Spey Valley AGLV. These not significant effects arise from limited magnitude of landscape change from the CNP and from medium levels of sensitivity combined with moderate levels of landscape change for the two local landscape designations.

6.8.38 Overall, no significant effects are considered to arise from potential landscape effects on each of the three designations as the proposed development would be experienced, particularly from elevated locations in the context of the operational development cluster of Paul's Hill I and Berryburn. In addition, the key characteristics and features of the designations would remain largely unaffected and the Special Qualities of each of the three designations as detailed in Table 6.19 and Table 6.21 would not be significantly affected as a result of the addition of the proposed Paul's Hill II Wind Farm development.

6.9 VISUAL IMPACT ASSESSMENT

6.9.1 The aim of the Visual Impact Assessment (VIA) is to identify, predict and evaluate potential key effects arising from the addition of the proposed Paul's Hill II Wind Farm development on people's views and visual amenity. Effects on views and visual amenity as experienced by people can be caused by changes in the appearance of the landscape resulting from the development. Description of the visual baseline and analysis of ZTVs is contained in Section 6.7 of the main chapter.

6.9.2 Assessing the significance of visual effects requires the identification of the visual receptors, the consideration of the nature of the visual receptors (sensitivity) and the nature of the effect (magnitude), which would be experienced by each visual receptor as a result of the proposed development. The methodology for the visual assessment is detailed in Appendix A6-1.

6.9.3 A Cumulative Visual Impact Assessment (CVIA) is also included in the following VIA and considers the level of effect as a result of the addition of the proposed development into each cumulative baseline scenario separately. The baseline scenarios are described in Section 6.7.

6.9.4 Section 6.7 details the visual receptors that have been identified and taken forward to be assessed in the VIA and CVIA below.

ZTV Analysis of overall visibility

6.9.5 The ZTV is a tool which can be used to calculate the theoretical visibility of the wind farm. It is important to note that visibility can be considerably reduced by screening afforded by buildings and woodland, particularly from built up and lowland areas. Views from along roads and in rural areas are often filtered by woodland, hedgerows and roadside vegetation and forestry plantations. This can be seasonal when trees are deciduous.

6.9.6 The ZTV (Figure 6.1 - 6.3) shows the theoretical visibility of the wind farm throughout the 40 km study area. Field surveys were undertaken to verify potential views on the ground and to assess the overall actual visibility of the wind farm.

6.9.7 The general pattern of theoretical visibility across the study area picks out the north-east-south-west orientation of the Spey Valley with more open, broad areas experiencing visibility of the proposals once set back from the visually enclosing upland edge. Localised high points from the transitional rolling farmland landscape to the north are also highlighted by the ZTV as are more distant summit tops from within the CNP to the south. An inner ring of hills within the open uplands close to the site visually screen western views from the moorland basins and lower lying farmland to the west, and the containing ridgelines around Ben Rinnes prevent south-eastern views from the Aberdeenshire lowlands. Further north, the open uplands containing the proposed development form a distant backdrop with some distant visibility from the subtle higher ridgelines within the coastal plain backing the Moray Firth coastline.

6.9.8 This assessment considers close, mid-range and distant views of the wind farm from the surrounding area, as detailed below.

Within 5 km

6.9.9 Turbines will be visible from most areas of the surrounding landscape up to 2 km from the proposed turbines. Roy's Hill however provides some immediate south-eastern screening resulting in patchy theoretical visibility only from the south-eastern side slopes of the western bank of the Spey up to 5 km from the proposed development. In reality, these side slopes are forested further cutting down actual visibility from the south-eastern direction beyond 1.5 km from the proposed turbines.

6.9.10 South-western visibility extends across the rolling hillside of the proposed development area and across most of the operational Paul's Hill Wind Farm site up to 1.5 km from the proposed turbines. The summit of Paul's Hill landform screens views from its' steep western slopes with a strip of non-visibility corresponding to the narrow incised Valley of the Glen Gheallaidh marking the Authority boundary and the transition from the Moray LCT11 open rolling uplands to the Moray and Nairn MN10 Open uplands character area and the Cairngorms CNG2: Area 4; Strathclyde Hills LCA. Visibility then picks up again in this direction, rising to full visibility again of all 7 proposed turbines from the upper slopes and summits of the CNG2: Area 4 ridgeline of Larig Hill, located to the south-west of Pauls Hill II Wind Farm development and including the summits of Carn na h-Eige and Gheal-charn, and located up to 4 km from the proposed turbines.

6.9.11 To the north-west, theoretical visibility continues for 1.5 km with some localised patches of none or reduced partial visibility of blade tips from shallow valley depressions cut by the numerous burns into the hillside. In this direction, there is then a break in visibility around the lower lying complex landform area with numerous basins and lochans until theoretical visibility resumes and continues in large patches to the north and north east across the extensive forested Glen Lossie. In reality very little actual visibility or public access occurs within this dense forested land.

6.9.12 To the north-east, theoretical visibility of all 7 proposed turbines extends virtually continually up to and beyond 5 km from the proposed turbines, across the eastern edge of the open rolling uplands to the forested moorland landscape across the Burn of the Cowlatt and Knockando Burn, with some small areas of localised non-visibility for valley depressions and low points.

Between 5-20 km

6.9.13 Beyond 5 km, theoretical visibility extends to the south-east in large patches between 5-10 km from the proposed development with intermittent theoretical visibility from the lower slopes of the eastern bank of the Spey Valley, extending upslope to cover the western slopes of the containing hills, such as Tom a Chait, Hill of Knocknashalg and the higher peak of Ben Rinnes at 13 km from the proposed development. Here, there is variable partial visibility as the slope rises until all proposed 7 turbines are theoretically visible from the Ben Rinnes summit and the summits and upper west facing slopes of Meikle Conval and Little Conval, further east. Beyond Ben Rinnes, only the high ridgelines set further away between 13-20 km to the south of Glen Rinnes and Strath Avon show potential visibility of the proposed Paul's Hill II Wind Farm to the south-east.

6.9.14 To the south, visibility continues from the rising slopes of the eastern bank of the Spey Valley as it enters the CNP and becomes the Lower Strathspey series of LCAs. There is no visibility from the lower valley bottom but theoretical visibility does extend up the valley sides within the Lower Strathspey: Haughs of Cromdale LCA and the Lower Strathspey: Burn of Dalvey Glen LCA which form the western slopes of the Cromdale Hills in the north of the CNP. This southern visibility forms a narrow strip on these upper slopes and the summits prevent further southern visibility within 20 km from the lower lying Strath Avon landscapes.

6.9.15 Visibility from the south-west and west is very limited between 5-20 km from the proposed development, owing to the high summits located in MN10 Open uplands LCT to the south-west and comprising Carn Ruighe an Uain to Creag a' Bharrain at around 8 km from the proposed development and the summits of Carn Kitty and Carn Ghiubhais close to the proposed development to the west and north west which restrict views across the moorland basin of Moidach More and beyond. Western visibility is therefore restricted to small patches of partial visibility of up to 4 of the proposed turbine nacelles from the higher summits containing Lochindorb and other localised high points such as Hill of Aitnoch and north of the Cairn Duhie landform.

6.9.16 Visibility from the north-west and north, beyond 5 km extends across the high points of the Upland Moorland LCT10 on both sides of the road pass from Knockando to Dallas. In reality this includes extensive areas of dense forestry, parts of the operational Rothes I and II Wind Farms and the southern slopes of Meikle Hill which is the site of the consented 6 turbine development west of Rothes I and II. Beyond 10 km, visibility is restricted to the lower slopes of the forested Hill of the Wangie ridge, north of the settlement of Dallas which shows limited partial to no visibility, Hill of mulundy and to the north, the western end of the Heldon Hill forested ridge. Much of these areas of theoretical visibility are from dense forested land with no actual visibility toward the proposed development.

6.9.17 Visibility from the north-east extends to the southern slopes of Carn na Cailliche with a gap in visibility until scattered patches of visibility occur, beyond 10 km, from the partly forested, subtle moorland ridgeline of Moss of

Birnie and Green Hill and beyond 15 km, from west facing slopes of Brown Muir and the forested Hunt Hill and Findlay's Seat.,…..

Between 20-40 km

6.9.18 Visibility from the south-east beyond 20 km is very limited to small isolated patches of theoretical visibility from northern upper slopes of the Ladder Hills and the Lecht ski area, up to 31 km from the proposed development with no further visibility beyond this. Visibility more from the south, includes isolated small patches of visibility from higher summits such as Carn na Farraidh, Geal Charn Beag, Carn na Ruabraich and Little Drum Loin. Larger patches of mixed full and partial visibility occur beyond 36 km from within the Cairngorms central massif from the Munros of Stob an t'sluichd and Stob Bac an Fhurain, North Top and Cnap a Chleirich.

6.9.19 Further south-west, visibility continues as scattered patches of visibility of all proposed 7 turbines from Cairn Gorm and the high ridgelines radiating from it at a distance of 39 km from the proposed development. Visibility extends further west and beyond 35 km to large patches of partial visibility from the Upper Strathspey landscapes around Boat of Garten and further south around Aviemore and containing ridgelines such as the Meall a Bhuachaille, Creagan Gorm and Craiggowrie.

6.9.20 Visibility from the west is restricted to scattered isolated small patches of partial visibility of up to 4 turbines from the highest parts of the Strathdearn Hills and the edge of the Monadhliaths, continuing further north to patches of mixed full and partial visibility from the higher parts of the MN10 open uplands west of Banchor. North-west, visibility is limited to low, often forested hills in the transitional landscapes from upland to lowland. Visibility from the north is extremely limited around Elgin to low hills on the edge of the town and large patches of mixed full and partial visibility occur between Burghead and east of Lossiemouth, corresponding to a subtle raised ridgeline which backs the shoreline landscapes which dip towards the Moray Firth and consequently has very little visibility southwards towards the development. In reality this is very distant visibility experiencing the ridgeline across many different intervening landscapes with views easily intercepted by woodland blocks, built up development within the settled coastal plain and roadside vegetation.

6.9.21 Visibility from the north east beyond 20 km is limited to the broad forested hills set within farmland such as Ordequish and Millstone Hill, together with a swathe of distant visibility south of Buckie. Eastern visibility is restricted further to small isolated patches from the transitional moorland edge landscapes of Aberdeenshire.

6.9.22 Overall, visibility is limited to the uplands surrounding the proposed development and the containing slopes of the eastern bank of the Spey. Scattered distant visibility occurs from some summits within the CNP to the south and from parts of the coastal plain to the north.

Analysis of the ZTVs with other existing wind farms

6.9.23 There are a number of operational wind farms in the study area, which include Paul's Hill, Berryburn, Rothes I and II, Hill of Towie and Clashindarroch. These wind farms are included as part of the baseline for the assessment, since they are already present in views.

6.9.24 Figure 6.11h shows the ZTV of the proposed development in combination with the ZTVs of all of the operational wind farms combined out to a distance of 40 km from the proposed development. Figure 6.11h shows the visibility of the proposed Paul's Hill II Wind Farm largely overlaps with the operational developments, and mostly with the operational Paul's Hill development, as corroborated by Figure 6.11a. Two main areas of additional visibility occur of the proposed development where, currently no wind farm visibility occurs. These are distant visibility beyond 35 km from the proposed development around Buckie in the north east of the study area, and a thin strip of visibility extending to lower slopes of the Upper Spey from Grantown to Aviemore. Scattered throughout the study area, slight extensions of visibility occur, from down the side slopes from summit visibility of operational developments.

6.9.25 There are extensive areas of yellow on the figure, indicating where operational developments are visible but the proposed development is not.

Effect on Selected Viewpoints

6.9.26 The ten selected viewpoints that were identified to represent the general visual amenity throughout the study area are assessed in detail in the following Table 6.24 - Table 6.33.

Viewpoint 1

Table 6.24: Viewpoint 1 Assessment

Viewpoint 1: Tormore Distillery
Location
This Viewpoint is located 5.9 km to the south south east of the proposed Paul's Hill II Wind Farm development at an elevation of 229 m AOD. It is situated within the River Valleys LCT (MRN3) of Moray and Nairn. It is taken from the grass verge of the A95 adjacent to the perimeter fencing of the Tormore Distillery frontage. It is representative of views obtained from the A95 transport route and the front entrance to the recreational attraction of the Distillery which is advertised on the Whisky Trail throughout Speyside. In addition, nearby receptors include the residential properties along Richardson Road, to the west of the Distillery buildings, and a section of the long distance footpath of the Speyside Way which joins the A95 approximately 600 m to the west of the viewpoint location.
Sensitivity
Value of the view: ***Medium***. Popular visitor attraction that is well promoted by tourist literature but the view does not necessarily form a key part of the visitor experience. Heritage buildings associated with the distillery are the visual focus. *Susceptibility:* ***High***. Nearby residents, travellers along the Whisky Trail advertised route with some focus on the landscape and particular views along the route although, the view is not integral to the heritage asset of the distillery and environs. *Overall Sensitivity:* ***Medium*** sensitivity of this viewpoint as residents and walkers of the Speyside Way are located further west from the viewpoint itself and the view is not integral to the experience from the distillery.
Existing View (including cumulative baseline 1)
Clear views northwards across the open pastures and riparian woodland along the banks of the Spey Valley toward the low containing Hills including Roy's Hill and Geal-Charn which form the current skyline. The forest cover of Straan wood and Hill of Dalnapot soften the lower slopes and intervening mixed woodland blocks and shelter belts on the gentle slopes of the southern bank of the river break up the view toward the skyline hills. A line of the existing Paul's Hill turbines are partially visible above the yoke of land which forms a dip in the skyline created between the summits of Geal-Charn and Roy's Hill. The full tower heights are obscured by forest cover and topography.
Predicted View (including cumulative baseline 1)
The predicted operational view is depicted in Figure 6.14a. Parts of 5 of the 7 Paul's Hill II turbines are theoretically visible from this viewpoint. This comprises 2 nacelles and 3 blade tips. In reality as shown in EIAR Figure 6.14a, 2 blade tips are barely discernible owing to the intervening topography and distance of the viewpoint, leaving Turbine No's. 5, 6 and 7 as noticeable features on the skyline. There will be combined simultaneous visibility of the proposed Paul's Hill II turbines with the original Paul's Hill turbines. The proposed turbines overlap with the original Paul's Hill turbines and continue the original line across a small portion of the skyline, integrating the two schemes. The Paul's Hill II turbines appear larger than the original Paul's Hill turbines making the overall wind farm development appear closer to the viewer and extending the depth of the development. Overall, the openness of the view is retained and there is a noticeable visual change to the skyline.

Viewpoint 1: Tormore Distillery

Predicted Cumulative View

No other scenario 2 or scenario 3 wind farm developments are visible from the viewpoint. There will be no additional cumulative effects over and above those identified in the LVIA assessment.

Magnitude of Visual Change

Geographical Extent: ***Small***. Clear, though oblique view for some distance from this viewpoint along this sequential route.

Size and Scale: ***Moderate***. Difference in scale of Paul's Hill II turbines and original turbines is apparent but some visual integration owing to the overlapping of the two schemes and narrow portion of view affected.

Duration and Reversibility: Long term theoretically reversible change

Overall Magnitude of visual change: ***Moderate*** Magnitude of visual change causing a noticeable change in the view as a result of the additional of new features on the skyline. Horizontal overlapping of original and proposed turbines allow some integration with existing cumulative baseline but some visual contrast in developments. Changes would be long term but theoretically reversible.

Magnitude of Cumulative Change

Moderate Magnitude of Cumulative Change in respect of the existing/consented developments (scenario 1). ***No additional change*** for scenario 2 and 3.

Visual Effect

Moderate and ***Significant***. Considered borderline significant effect owing to the wide extent of this view along this section of the A95 and the importance of the containing hills to the view from the promoted Whisky Trail.

Cumulative Visual Effect

Moderate/Major and ***Significant*** for scenario 1 developments. ***No additional cumulative visual effect*** for scenario 2 and 3

Viewpoint 2

Table 6.25: Viewpoint 2 Assessment

Viewpoint 2: Ben Aigan

Location

This Viewpoint is located 18.1 km to the north east of the proposed Paul's Hill II Wind Farm development at an elevation of 472 m AOD. It is situated within the Rolling Forested Hills LCT (9) of Morayshire. It is taken from the western side of the rounded summit of Ben Aigan. It is representative of views obtained from this recreational walking summit located just to the north of the village of Craigellachie and above the lower lying walking route of the Speyside Way.

Sensitivity

Value of the view: **High**. Popular hill for walkers that appears in tourist literature. More popular with keen walkers than casual visitors as some fitness is required to reach the summit. As with all summit views the view forms a key part of the visitor experience. Views of local importance rather than national importance, recognised by local landscape designation of the Spey Valley AGLV which this viewpoint lies on the edge of.

Susceptibility: **High**. Walkers whose principal interest and attention is focussed on the wider view.

Viewpoint 2: Ben Aigan

Overall Sensitivity: **High** sensitivity of this viewpoint as walkers' attention is focussed on the landscape and the viewpoint is a relatively accessible and popular walking hill.

Existing View (including cumulative baseline 1)

Clear views westwards across the forested upper slopes of the Broad farmed Spey Valley toward the open rolling uplands containing Paul's Hill I Wind Farm development which is visible as a distant line of turbines, partially obscured by the intervening ridgeline between Roy's Hill whose summit is clear of existing turbines and Carn na Dubh-Claise. Berryburn turbines are seen as a similarly distant element, set within the distant hills and as the eye scans northwards the existing Rothes I and II Wind Farm developments are visible closer to the viewer, partially backclothed within the forested upland moorland. As the view progresses northwards the sea is visible on a clear day, drawing the eye to this strong horizon line. Continuing eastwards the view takes in the existing Hill of Towie Wind Farm which takes up an approximate 25º angle of view in the near to middle distance where infrastructural access roads and crane pads of this development are visible.

Predicted View (including cumulative baseline 1)

The predicted operational view is depicted in Figure 6.14b. The full tower heights of 6 of the 7 Paul's Hill II turbines are theoretically visible from this viewpoint together with the nacelle of the remaining turbine. The Paul's Hill II turbines appear larger than the original Paul's Hill turbines making the overall wind farm development appear closer to the viewer and extending the depth of the development as the proposed turbines coming forward beyond the ridgeline of Roy's Hill and Carn na Dubh-Clais. However the proposed turbines remain a separate array to the Berryburn turbines and in appearance (vertical size) are not incongruous to the Rothes I and II turbine grouping seen in the simultaneous view. The existing Hill of Towie turbines seen in the successive view are still much closer to the viewer than the proposed Paul's Hill turbines and would remain a focal point in the panoramic view. Overall, the openness of the view is retained and there is a perceptible visual change to the skyline.

Predicted Cumulative View

scenario 2 consented wind farm developments of Hill of Glaschyle, Meikle Hill and Kellas would be visible overlapping the existing Rothes I and II developments and therefore continuing this Rothes array, separate to the proposed Paul's Hill II development. The consented Hill of Towie would also extend the Hill of Towie array in the successive view to a 45º angle of turbines. This would further draw the eye from the direction of view containing the Paul's Hill II development as the extended Hill of Towie array would be substantially closer to the viewer taking up a substantial portion of view in the opposite direction. The scenario 2 consented Dorenell and Cairn Duhie and the scenario 3 proposed developments of Dorenell Variation and Extension would be sufficiently distant so as to result in no additional cumulative effects.

Magnitude of Change

Geographical Extent: ***Small.*** Clear view from summit and upper western slopes with lower slopes covered in forestry reducing extent of visibility from Ben Aigan hill and very narrow portion of overall panoramic view affected.

Size and Scale: ***Minor***. Owing to the distance from the proposed development, the difference in scale of Paul's Hill II turbines and the original turbines is not prominent and there is some visual integration owing to the overlapping of the two schemes and narrow portion of panoramic view affected. The existing Hill of Towie turbines in the successive view to the left hand side of the Paul's Hill turbines draws the eye taking up a larger portion of the view at a closer proximity to the viewer.

Duration and Reversibility: ***Long*** term theoretically ***reversible*** change

Viewpoint 2: Ben Aigan

Overall Magnitude of visual change: ***Slight.*** Magnitude of visual change causing a perceptible change in the view as a result of the addition of new features partially on the skyline, which partially alters the composition of a narrow part of the overall panoramic view. Horizontal overlapping of original and proposed turbines allow some integration with existing cumulative baseline but some visual contrast in developments, although barely perceptible at this distance. Changes would be long term but theoretically reversible.

Magnitude of Cumulative Change

Slight Magnitude of Cumulative Change in respect of the existing/consented developments (scenario 1). Reduces to ***negligible*** for scenario 2 because of the prominence of the Hill of Towie and Hill of Towie II combined developments in a successive view to the Paul's Hill array, (the viewer must turn their head). No additional change for scenario 3.

Visual Effect

Moderate and ***not significant.*** Considered a not significant effect owing to the limited portion of the view affected and the far distance of the viewer from the view.

Cumulative Visual Effect

Moderate and ***not significant*** for scenario 1 developments. Cumulative visual effect remains ***moderate*** for scenario 2 and ***no additional change*** for scenario 3.

Viewpoint 3

Table 6.26: Viewpoint 3 Assessment

Viewpoint 3: Ben Rinnes

Location

This Viewpoint is located 13.2 km to the east south east of the proposed Paul's Hill II Wind Farm development at an elevation of 833 m AOD. It is situated within the Open Uplands with Steep Slopes LCT (12a) of Morayshire. It is taken from a rock outcrop adjacent to the Trig Point on the summit of Ben Rinnes. It is representative of views obtained from this recreational walking summit located to the south west of Aberlour to the north of the CNPA boundary.

Sensitivity

Value of the view: **High**. Popular hill for walkers that appears in tourist literature. More popular with keen walkers than casual visitors as some fitness is required to reach the summit. As with all summit views the view forms a key part of the visitor experience. Views of local importance rather than national importance, recognised by local landscape designation of the Spey Valley AGLV which this viewpoint lies on the edge of.

Susceptibility: **High**. Walkers whose principal interest and attention is focussed on the wider view.

Overall Sensitivity: **High** sensitivity of this viewpoint as walkers' attention is focussed on the landscape and the viewpoint is a relatively accessible and popular walking hill.

Existing View

Clear views north westwards across the forested upper slopes of the Broad Farmed Spey Valley toward the open rolling uplands containing Paul's Hill I Wind Farm which is visible as a distant grouping of turbines wholly backclothed against the retreating hills, owing to the elevated nature of this summit viewpoint. The Berryburn turbines are barely discernible but are present behind the Paul's Hill turbines and partially overlapping with this existing array. The Rothes I and II developments are visible as a separate turbine grouping to the right

Viewpoint 3: Ben Rinnes

hand side of the Paul's Hill existing development on a separate but identifiable landform. As the view progresses northwards the sea is just visible on a clear day, with the Hill of Towie existing turbine array intercepting views toward the coast. Clashindarroch is barely noticeable in the south eastern view and views south west extend toward the impressive core peaks of the CNP with no existing turbine development visible in this direction of view.

Predicted View (including cumulative baseline 1)

The predicted operational view is depicted in Figure 6.14c. The full tower heights of 2 of the 7 Paul's Hill II turbines are theoretically visible from this viewpoint together with the nacelles of the remaining 5 turbines which are visible behind Roy's Hill. The Paul's Hill II turbines appear larger than the original Paul's Hill turbines which fits with the natural perspective in this case as the Paul's Hill II turbines are closer to the viewer. The proposed turbines also increase the depth of the overall Paul's Hill development and extends the horizontal spread. This produces an extended development focussed behind the landform of Roy's Hill. However, from this elevated viewpoint, the prominence of Roy's Hill as an elevated feature is substantially reduced as it blends into the rolling uplands on the other side of the Spey Valley from the viewer. From this perspective, the Paul's Hill extended development therefore appears to settle well within these uplands and is entirely backclothed against the retreating landform. Other existing developments within this simultaneous view and successive views, where the viewer must turn their head, appear as well separated developments from the Paul's Hill extended development and appear settled within their own identifiable landforms. Overall, the openness of the view is retained and there is a perceptible visual change.

Predicted Cumulative View

scenario 2 consented wind farm developments of Meikle Hill and Kellas would be visible overlapping the existing Rothes I and II developments and therefore continuing this array, separate to the proposed Paul's Hill II development and the consented Hill of Glaschyle would be barely perceptible at a distance of 24.7 km from the viewer. In successive views, the consented Hill of Towie II would also extend the Hill of Towie array slightly in the distant view with a barely perceptible effect and the consented Dorenell would introduce turbines to an approximate 45^{o} angle of view in the south-eastern successive view at a closer distance then the Paul's Hill II turbines at 7.7 km from the viewer. This would draw the eye from the direction of view containing the Paul's Hill development as the Dorenell array would be closer to the viewer taking up a substantial portion of view in the opposite direction. The Scenario 2 Cairn Duhie development is sufficiently distant so as to result in no additional cumulative effect..The scenario 3 proposed developments of Dorenell Extrension and Variation would create a similar effect to the consented Dorenell, although this revised turbine array would be denser but with a similar horizontal spread.

Magnitude of Change

Geographical Extent: ***Small.*** Clear view from summit and northern approach to the summit. Very narrow portion of overall panoramic view affected.

Size and Scale: ***Minor***. Owing to the distance from the proposed development and the screening of the full tower heights of most of the proposed turbines, the difference in the scale of Paul's Hill II turbines compared to the original turbines is not as obvious and there is some visual integration owing to the overlapping of the two schemes and the narrow portion of panoramic view affected, despite the slight horizontal extension created by the proposed turbines. The Paul's Hill II turbines also continue to fit with the overall wind farm pattern which consists of separate turbine arrays on their own identifiable landforms.

Viewpoint 3: Ben Rinnes

Duration and Reversibility: ***Long*** term theoretically ***reversible*** change

Overall Magnitude of visual change: ***Slight.*** Magnitude of visual change causing a perceptible change in the view as a result of the addition of new features which partially alters the composition of a narrow part of the overall panoramic view. Horizontal overlapping of original and proposed turbines allow some integration with existing cumulative baseline. Changes would be long term but theoretically reversible.

Magnitude of Cumulative Change

Slight Magnitude of Cumulative Change in respect of the existing/consented developments (scenario 1). Reduces to ***negligible*** for scenario 2 because of the prominence of the Dorenell development in the south-eastern successive view to the Paul's Hill array, (the viewer must turn their head). No additional change for scenario 3, Magnitude of cumulative change remains at ***negligible***.

Visual Effect

Moderate and ***not significant.*** Considered a not significant effect owing to the limited portion of the view affected and the distance of the viewer from the view.

Cumulative Visual Effect

Moderate and ***not significant*** for scenario 1 developments. Cumulative visual effect remains ***moderate,*** although borderline for scenario 2 and ***no additional change*** for scenario 3.

Viewpoint 4

Table 6.27: Viewpoint 4 Assessment

Viewpoint 4: Minor road, Knockando to Dallas, nr Aultnahuish

Location

This Viewpoint is located 7.5 km to the north north east of the proposed Paul's Hill II Wind Farm development at an elevation of 230 m AOD. It is situated within the Upland Moorland and Forestry LCT (10) of Morayshire. It is taken from the grass verge at the side of the Dallas to Knockando minor road near to the access entrance to the property of Aultnahuish. It is representative of views obtained from the local transport route and residents travelling to and from their properties.

Sensitivity

Value of the view: **Low**. A local access road connecting the A95 and village of Knockando to Dallas and the northern coastal routes. The viewpoint is not recognised by any landscape or scenic designations.

Susceptibility: **Low**. Travellers on the route where the view is not important to the journey. Residents travelling to and from their properties.

Overall Sensitivity: **Low** sensitivity of this viewpoint as this is a local transport route which passes through substantial areas of commercial forestry and where the focus is on travel, not on the landscape.

Existing View

Open views south westwards across the riparian scrub woodland and forestry blocks of Glen Lossie and the forested moorland toward the open tops of the rolling upland where the proposed development is situated. Forestry restructuring is evident and scattered farmsteads occupy the view, often partially obscured by shelterbelts. Nacelles of the original Paul's Hill Wind Farm are barely visible on the skyline above the broad topped Carn Shalag landform which obscures the full height of this development. The Berryburn development is more evident and is partially backclothed against Carn Kitty, appearing as a separate development to the Paul's Hill turbines. In the successive south eastern view, the original Rothes I and II developments occupy a

Viewpoint 4: Minor road, Knockando to Dallas, nr Aultnahuish

45º angle of the view at a distance of 3.2 km and 2.3 km from the viewer. This is a prominent feature in the landscape and draws the eye from the south-western view towards the Paul's Hill development. This stretch of the minor road is also well vegetated in places with intermittent visibility between the gaps in vegetation toward the proposed development site.

Predicted View (including cumulative baseline 1)

The predicted operational view is depicted in Figure 6.14d. The full tower heights of 6 of the 7 Paul's Hill II turbines are theoretically visible from this viewpoint together with the nacelle of the remaining turbine which would theoretically be visible behind the Carn Shalag/Roy's Hill ridgeline. The proposed development therefore theoretically brings the Paul's Hill development over the lip of the intervening ridgeline. However, in reality, intervening remaining forestry in the upper reaches of Glen Lossie filter views toward turbine no's. 1, 4, 2 and 3, softening this effect of the turbines coming off the skyline. Some stacking is evident owing to the angle of the viewer but this is a glimpsed view from a 'snapshot' location along a continuous route, and this stacking would not be a continuous visible feature. The few turbines actually visible of the original Paul's Hill development are well separated from the Paul's Hill II turbines appearing as a separate development focused around the adjacent hilltop. This reduces any potential incongruous view relating to the difference in scale between the original and proposed Paul's Hill turbines. The existing Rothes I and II developments continue to draw the eye in the successive south eastern view reducing the perceptibility of the proposed turbines. Overall, the openness of the view is retained and there is a noticeable visual change to the skyline.

Predicted Cumulative View

The scenario 2 consented wind farm development of Meikle Hill would introduce 6 turbines adjacent to the roadside. This would draw the eye from the south-western view toward Paul's Hill and would create a dominant feature in the landscape. The consented development of Kellas would be barely distinguishable from the Rothes I and II developments. No scenario 3 proposed developments would be visible from this viewpoint.

Magnitude of Change

Geographical Extent: ***Small.*** View from a 'snapshot' location as viewer travels along a road route. Narrow portion of overall view affected.

Size and Scale: ***Moderate***. Owing to the intervening forestry screening the full tower heights of most of the Paul's Hill II turbines and the limited visibility of the existing Paul's Hill I Wind Farm development, the Paul's Hill array appears as separate turbine developments from this viewpoint. This limits the horizontal spread of visible turbines and creates a wind farm pattern of compact developments focussed on separate hilltops. 5 nacelles would be actually visible above or through the tracery of the intervening forestry. The movement of the 'stacked' or overlapping turbines no's. 5 and 6 would be noticeable above the skyline.

Duration and Reversibility: ***Long*** term theoretically ***reversible*** change

Overall Magnitude of visual change: ***Moderate.*** Magnitude of visual change causing a noticeable change in the view as a result of the addition of new features which alters the composition to a moderate degree to only a narrow part of the overall view. The existing features of the Rothes I and II turbines remain the prominent visible feature from this viewpoint drawing the eye from the south western view containing the proposed Paul's Hill II turbines. Changes would be long term but theoretically reversible.

Magnitude of Cumulative Change

Moderate Magnitude of Cumulative Change in respect of the existing/consented developments (scenario 1). Reduces to ***slight*** for scenario 2 owing to the size and scale predicted to be negligible, because of the dominance of the view by the Meikle Hill development in the north-eastern successive view to the Paul's Hill array. No additional change for scenario 3. Magnitude of cumulative change remains ***slight***.

Visual Effect

Viewpoint 4: Minor road, Knockando to Dallas, nr Aultnahuish
Negligible/Minor and ***not significant.*** Considered a not significant effect owing to the low sensitivity of the viewpoint, the limited portion of the view affected and the prominence of other visible existing turbine developments which focus the viewer's attention away from the direction of view containing the proposed development site.
Cumulative Visual Effect
Negligible/Minor and ***not significant*** for scenario 1 developments. Cumulative visual effect remains ***Negligible/Minor*** and ***not significant,*** although borderline with negligible for scenario 2 and ***no additional change*** for scenario 3.

Viewpoint 5

Table 6.28: Viewpoint 5 Assessment

Viewpoint 5: Carn a Ghille Chearr summit, Hills of Cromdale
Location
This Viewpoint is located 10.6 km to the south south east of the proposed Paul's Hill II Wind Farm development at an elevation of 708 m AOD. It is situated within the Strath Avon: Lower Strath Avon LCT (34) of the CNP. It is taken from a position to the north of the summit Trig Point from amidst the rounded heathland summit of Carn a Ghille Chearr. It is representative of views obtained from this recreational walking summit located on the CNPA boundary.
Sensitivity
Value of the view: **High**. Popular hill for walkers that appears in tourist literature. More popular with keen walkers than casual visitors as some fitness is required to reach the summit. As with all summit views the view forms a key part of the visitor experience. Views of national importance, recognised by the CNP designation. *Susceptibility:* **High**. Walkers whose principal interest and attention is focussed on the wider view. *Overall Sensitivity:* **High** sensitivity of this viewpoint as walkers' attention is focussed on the landscape and the viewpoint is a relatively accessible and popular walking hill.
Existing View
Clear views northwards, across the forest blocks of Knockfrink and Straan woods on the upper slopes of the Broad farmed Spey Valley toward the open rolling uplands containing the existing Paul's Hill I Wind Farm development. This is visible as a grouping of turbines wholly backclothed, owing to the elevated nature of this summit viewpoint, against the retreating hills on the other side of the Spey Valley. The Berryburn turbines are barely discernible, theoretically visible as blade tips from behind the Carn Kitty landform with the exception of the eastern Berryburn turbines which blend with the existing Paul's Hill turbines. The existing Rothes I and II developments are just visible at distances of 19 and 20 km from the viewer on the identifiable moorland edge, visible as a darker swathe of landform well separated from the rolling hills containing Paul's Hill. The Hill of Towie existing turbines are visible in the successive eastern view emerging behind the peak of Ben Rinnes at a distance of 26.4 km from the viewer. Progressing southwards the view takes in the impressive peaks of the CNP with no turbine development visible in this direction.
Predicted View (including cumulative baseline 1)
The predicted operational view is depicted in Figure 6.14e. The full tower height of 1 of the 7 Paul's Hill II turbines are visible from this viewpoint together with nacelles of 4 turbines and 2 blade tips which are visible behind Roy's Hill. The Paul's Hill II turbines appear larger than the original Paul's Hill turbines and turbines no's. 6 and 7 are visible at the side of Roy's Hill. This gives the impression of extending Paul's Hill development closer to the viewer and increases the horizontal spread and depth of the overall development

Viewpoint 5: Carn a Ghille Chearr summit, Hills of Cromdale
around Roy's Hill. From this elevated viewpoint, the prominence of Roy's Hill as an elevated feature is substantially reduced, the summit does not skyline and it blends into the rolling uplands on the other side of the Spey Valley from the viewer. Roy's Hill also provides screening of the full tower heights and nacelles of the Paul's Hill II turbines. The Paul's Hill extended development appears settled within these uplands and is mostly backclothed with the exception of turbine no. 6 against the retreating landform. Other existing developments within this simultaneous view and successive views, where the viewer must turn their head, appear as well separated developments from the Paul's Hill extended development and appear settled within their own identifiable landforms. Overall, the openness of the view is retained and there is a perceptible visual change to the view.
Predicted Cumulative View
scenario 2 consented wind farm developments of Hill of Glaschyle and Meikle Hill would be visible over 20 km from the viewer but would appear as separate developments to the proposed Paul's Hill II development. The consented Kellas at 21.6 km would be barely visible overlapping the existing Rothes I and II developments. In successive views, the consented Hill of Towie II would also extend the Hill of Towie array slightly in the distant view with a barely perceptible effect and the consented Dorenell would similarly be barely visible at 15.9 km from the viewer with only the very northern most turbines visible beyond the Corryhabbie Hill ridgeline. The Scenario 2 consented Cairn Duhie, located at 19.6 km from the viewer would also be visible in the successive western view but again would be visible as a separate array on its own landform and is sufficiently distant so as to result in no additional cumulative effect. More turbines of the scenario 3 proposed Dorenell variation and proposed Extension development would be visible but still appear as distant features on a completely separate landform to Paul's Hill II turbines with a barely perceptible cumulative effect.
Magnitude of Change
Geographical Extent: ***Small.*** Clear view from summit and northern approach to the summit. Very narrow portion of overall panoramic view affected. *Size and Scale:* ***Minor***. Owing to the screening of the full tower heights of most of the proposed turbines, there is some mitigation for the appearance of the difference in scales of the Paul's Hill II turbines compared to the original turbines, although turbine no's. 6 and 7 remain highly visible above the existing vertical level of the Paul's Hill array. There is also a slight horizontal extension of the Paul's Hill array created by the proposed turbines. *Duration and Reversibility:* ***Long*** term theoretically ***reversible*** change *Overall Magnitude of visual change:* ***Slight.*** Magnitude of visual change causing a perceptible change in the view as a result of the addition of new features which alters the composition of a narrow part of the overall panoramic view. The limited angle of view affected and the screening of most of the full tower heights offers some integration with existing cumulative baseline. Changes would be long term but theoretically reversible.
Magnitude of Cumulative Change
Slight Magnitude of Cumulative Change in respect of the existing/consented developments (scenario 1). No additional change for scenarios 2 and 3, owing to distance of other developments and clear separation from the proposed Paul's Hill II turbines. Magnitude of cumulative change remains at ***Slight***.
Visual Effect
Moderate and ***Not Significant.*** Considered not significant owing to the limited portion of the view affected, the moderate distance from the viewer, and the mitigating screening factors of the full height of the proposed turbines, although considered a borderline not significant owing to the high sensitivity of the viewpoint, being

Viewpoint 5: Carn a Ghille Chearr summit, Hills of Cromdale
of national importance. Overall, despite the sensitivity, the level of change experienced from this viewpoint is not considered to be an unacceptable change.
Cumulative Visual Effect
Moderate and ***Not Significant*** for scenario 1 developments. Cumulative visual effect remains ***moderate,*** with ***no additional change*** for scenarios 2 and 3 developments.

Viewpoint 6

Table 6.29: Viewpoint 6 Assessment

Viewpoint 6: Archiestown
Location
This Viewpoint is located 9.3 km to the east north east of the proposed Paul's Hill II Wind Farm development at an elevation of 232 m AOD. It is situated within the Broad Farmed Valley LCT (7) of Morayshire. It is taken from the grass verge at the side of the minor south bound road leading from the High Street/B9102, at a field access gate and adjacent to a residential property. It is representative of views obtained from the local transport route and residents of this edge of Archiestown.
Sensitivity
Value of the view: **Low**. A local access road connected to the B9102. The viewpoint is not recognised by any landscape or scenic designations. *Susceptibility:* **High**. Travellers on the route where the view is not important to the journey. Residents travelling to and from their properties and also residents within the curtilage of their properties. *Overall Sensitivity:* **Medium** sensitivity of this viewpoint as this is a local transport route where the focus is on travel, not on the landscape. However the viewpoint also represents residents within the garden grounds and environs of their properties including moving through the village.
Existing View
Open views westwards across garden grounds, open fields and the dense forestry of Monahoudie Moss toward Roy's Hill amidst the rolling upland. The original Paul's Hill development is visible to the right hand side of Roy's Hill as a line of partially screened turbines emerging from behind the shoulder of land between the high points of Roy's Hill and Carn na Dubh-Chlais. The foreground forestry screens views of Berryburn Wind Farm. Successive northern and eastern views take in the village context including other residential properties and garden vegetation which screen views toward the line of existing turbines of the Hill of Towie array, located 12 km from the viewer. This stretch of the minor road is well vegetated with intermittent visibility between the gaps in vegetation toward the proposed development site, as represented by this viewpoint.
Predicted View (including cumulative baseline 1)
The predicted operational view is depicted in Figure 6.14f. Almost the full tower heights of 5 of the 7 Paul's Hill II turbines are theoretically visible from this viewpoint, together with the nacelle of the remaining 2 turbines which would be visible behind the Roy's Hill ridgeline. The proposed development therefore brings the Paul's Hill Wind Farm over the lip of the intervening ridgeline, closer to the viewer. The intervening Monahoudie Moss forestry is not at a height to screen the upper parts of the Roy's Hill landform and the Paul's Hill array. The precise location of this viewpoint is determined by the rare glimpse from this minor road through gaps in the roadside vegetation and affords a stacked view of turbine no's. 2 and 3. A slight shift in the position of the viewpoint and this stacked view would no longer occur. The Paul's Hill II turbines appear larger and closer to the viewer which they are, providing a realistic perspective and overlap with the existing Paul's Hill array to provide some integration between the original and proposed turbines. Berryburn and Hill of Towie developments are theoretically but not actually visible in conjunction with the proposed turbines. Overall, the openness of the view is retained and there is a noticeable visual change to the skyline.
Predicted Cumulative View
Both scenario 2 developments of Dorenell and Hill of Towie would be theoretically but not actually visible owing to dense vegetation. The scenario 3 developments of the Dorenell Variation and Extension would also be theoretically but not actually visible from this viewpoint.

Viewpoint 6: Archiestown
Magnitude of Change
Geographical Extent: ***Small*****.** View from a 'snapshot' location as viewer travels along a road route, much of which is visually contained by roadside and garden vegetation. Narrow portion of overall view affected. *Size and Scale:* ***Moderate***. The overall spread of the combined Paul's Hill and Paul's Hill II turbines is limited owing to the proposed turbine overlapping with the existing array. However, the proposed turbines are larger and closer to the viewer and appear so, increasing the overall depth of the Paul's Hill array. The movement of the 'stacked' or overlapping turbine no's. 2 and 3 would be noticeable above the skyline. The view would not last long from along this sequential route as it is an oblique and glimpsed view from a farm access gate providing a break in roadside vegetation at the edge of the village properties. *Duration and Reversibility:* ***Long*** term theoretically ***reversible*** change *Overall Magnitude of visual change:* ***Moderate*****.** Magnitude of visual change causing a noticeable change in the view as a result of the addition of the new features of the Paul's Hill II turbines which alters the composition to a moderate degree. Changes would be long term but theoretically reversible but occur to only a narrow part of the overall view and from a glimpsed view.
Magnitude of Cumulative Change
Moderate Magnitude of Cumulative Change in respect of the existing/consented developments (scenario 1). No additional change for scenarios 2 and 3 as no other wind farm developments are actually visible owing to intervening vegetation. Magnitude of cumulative change remains ***Moderate***.
Visual Effect
Moderate effect considered to be ***not significant*** owing to the limited portion of the view affected and the limited experience of this view from a rare glimpsed location at the edge of Archiestown village from along a minor undesignated road.
Cumulative Visual Effect
Moderate and ***not significant*** for scenario 1 developments. ***No additional change*** for scenarios 2 and 3. Cumulative visual effect remains ***Moderate*** and ***not significant.***

Viewpoint 7

Table 6.30: Viewpoint 7 Assessment

Viewpoint 7: Upper Knockando
Location
This Viewpoint is located 4.3 km to the east north east of the proposed Paul's Hill II Wind Farm development at an elevation of 183 m AOD. It is situated within the Upland Moorland and Forest LCT (10) of Morayshire. It is taken from a farm access gate at the side of the minor road leading between Dallas and Upper Knockando. It is representative of views obtained from the local transport route. Residents of Upper Knockando would not have this view as they are located within a dip in the landform, further visually contained by riparian woodland.
Sensitivity
Value of the view: **Low**. A local access road connecting the A95 and village of Knockando to Dallas and the northern coastal routes. The viewpoint is not recognised by any landscape or scenic designations. *Susceptibility:* **Low**. Travellers on the route where the view is not important to the journey. Residents travelling to and from their properties.

Viewpoint 7: Upper Knockando

Overall Sensitivity: **Low** sensitivity of this viewpoint as this is a local transport route which passes through substantial areas of commercial forestry and where the focus is on travel, not on the landscape.

Existing View

Open views westwards across grassed banks adjacent to a tributary of Knockando Burn, towards the skyline of Roy's Hill and the closer hill top of Hill of Slackmore of the rolling uplands. The view continues northwards to take in the forested moorland before continuing east and southwards to take in the broad fields and riparian woodland of the farmed valley bottom. The original Paul's Hill development is visible in the westwards view, to the right hand side of Roy's Hill summit as a line of 5 nacelles and a number of blade tips, partially screened and emerging from behind the closer hilltop of Hill of Slackmore. Intervening woodland blocks on the upper slopes of the Hill of Slackmore provide negligible screening and scattered farmsteads are visible with associated shelterbelts across the intervening hillside. No other wind farm developments are visible from this viewpoint. This stretch of the minor road is visually open until north of Milton Farm access road where roadside vegetation and forestry visually enclose views.

Predicted View (including cumulative baseline 1)

The predicted operational view is depicted in Figure 6.14g. The nacelles and partial tower heights of 5 of the 7 Paul's Hill II turbines are theoretically visible from this viewpoint, together with the edge of blade tips of the remaining 2 turbines which would be visible behind Roy's Hill and Hill of Slackmore skyline. The proposed development remains behind the skylining ridge but appear as larger turbines closer to the viewer, which they are. The proposed turbines appear in front of and overlap with the existing Paul's Hill turbines but are far more noticeable than the existing turbines which would be just perceptible looking 'through' the proposed turbines and continuing to the right hand side of proposed turbine no. 3. There is some overlap between turbine no's. 2 and 3 but a slight shift in position further northwards along the road would increase the visible spacing between the proposed turbines, 'loosening' the density of the layout. No other wind farm development is visible from this viewpoint meaning the proposed turbines represent a new addition to the view. The openness of the view toward the containing skyline is retained and views toward the forested moorland skyline and broad farmed valley bottom remains unaffected.

Predicted Cumulative View

There would be no additional change to the scenario 2 and 3 views.

Magnitude of Change

Geographical Extent: ***Small.*** This view is experienced from approximately a 300m short section of road as the viewer travels along the route. Narrow portion of the overall view affected.

Size and Scale: ***Major***. The proposed turbines do not substantially increase the horizontal spread of the Paul's Hill array. However, the proposed turbines are larger and closer to the viewer and appear so, increasing the overall depth of the Paul's Hill extended development. The movement of the slightly 'stacked' or overlapping turbine no's. 2 and 3 would be prominent above the skyline. This is an oblique view from the road as it exits the village.

Duration and Reversibility: ***Long*** term theoretically ***reversible*** change

Overall Magnitude of visual change: ***Moderate.*** Magnitude of visual change causing a noticeable change in the view as a result of the addition of the new features of the Paul's Hill II turbines which alters the composition to a moderate degree. Changes would be long term but theoretically reversible but occur to only a narrow part of the overall view and from a short stretch of minor road.

Magnitude of Cumulative Change

Viewpoint 7: Upper Knockando

Moderate Magnitude of Cumulative Change in respect of the existing/consented developments (scenario 1). No additional change for scenarios 2 and 3 as no other wind farm developments are actually visible owing to intervening vegetation. Magnitude of cumulative change remains ***Moderate***.

Visual Effect

Minor/Moderate effect and ***not significant.*** Considered to be ***not significant*** owing to the low sensitivity of the viewpoint, the limited angle of the overall view affected and the limited experience of this view from a short stretch of minor, undesignated road.

Cumulative Visual Effect

Minor/Moderate and ***not significant*** for scenario 1 developments. ***No additional change*** for scenarios 2 and 3. Cumulative visual effect remains ***Minor/Moderate*** and ***not significant.***

Viewpoint 8

Table 6.31: Viewpoint 8 Assessment

Viewpoint 8: Carn Diamh

Location

This Viewpoint is located 16. 4 km to the south south east of the proposed Paul's Hill II Wind Farm development at an elevation of 560 m AOD. It is situated on the edge of the Strath Avon: Lower Strath Avon (34). Strath Avon: Mid Strath Avon (33) and Glen Livet (35) LCAs of the CNP. It is taken from a position on the north eastern upper heathland slopes of the rounded summit of Carn Diamh. It is representative of views obtained from this recreational walking summit located within the CNPA.

Sensitivity

Value of the view: **High**. Popular hill for walkers that appears in tourist literature. More popular with keen walkers than casual visitors as some fitness is required to reach the summit. As with all summit views the view forms a key part of the visitor experience. Views of national importance, recognised by the CNP designation.

Susceptibility: **High**. Walkers whose principal interest and attention is focussed on the wider view.

Overall Sensitivity: **High** sensitivity of this viewpoint as walkers' attention is focussed on the landscape and the viewpoint is a relatively accessible and popular walking hill.

Existing View

Clear views northwards, across the north eastern edge of the forest block covering the landform Coire na Fuaraig. The riparian woodland, along the upper slopes of Strath Avon is visible above the interlocking peaks of Carn Liath, Carn Ghrantaich, Carn a Ghille Chearr and Creag an Tarmachain which otherwise screen views of the lower valley landscapes. The tip of one of the original Paul's Hill turbines is visible behind the intervening landform of Carn a Ghille Chearr and to the left hand side of Roy's Hill which forms the horizon line in this direction. The Rothes I and II developments are revealed behind Carn na Cailliche up to 24.6 km from the viewer and well separated along the horizontal plane from Paul's Hill Wind Farm. Continuing north east, the view takes in Glen Livet and the settlement of Tomnavoulin, backclothed against Cairn Muldonich and the open uplands beyond. No other existing wind farm developments would be visible in this direction. Positioned on the northern side of Carn Diamh, southern views take in the rounded summit looming above the viewer.

Viewpoint 8: Carn Diamh
Predicted View (including cumulative baseline 1)
The predicted operational view is depicted in Figure 6.14h. The nacelles of up to 5 of the proposed Paul's Hill II turbines would be theoretically visible to the left hand side of Roy's Hill and on either side of the existing Paul's Hill nacelle and the blade tips of the remaining 2 proposed turbines. In reality, the distance of over 16 km from the viewer mitigates this view to some extent. The proposed turbines would be seen well separated from the only other existing developments in this view which would be Rothes I and Rothes II. Proposed turbine no's. 5, 6 and 7, are the most westerly proposed turbines and represent the most noticeable in this view, being too far west to be screened by the summit of Roy's Hill. Overall, the openness of the view is retained and there is a perceptible visual change to the view.
Predicted Cumulative View
Scenario 2 consented wind farm development of Meikle Hill would be visible over 25 km from the viewer as blade tips on the horizon which at this distance would be barely perceptible. The scenario 2 consented Kellas would be seen 'behind' and as part of the original Rothes I and II developments and not perceptible. The consented Dorenell would not be visible and the proposed scenario 3 Dorenell variation would be theoretically visible as one blade tip in the eastern view on the horizon above Glen Livet. This would not be perceptible owing to the foreground interest of the view in this direction. The proposed Paul's Hill II turbines would also appear as a very separate development with no relationship to these other theoretically visible developments.
Magnitude of Change
Geographical Extent: ***Small.*** Clear view from summit and northern slopes. Very narrow portion of overall panoramic view affected. *Size and Scale:* ***Minor***. Owing to the screening of the full tower heights of the proposed turbines and the visibility of only one of the existing Paul's Hill turbines, the difference in scales of the Paul's Hill II turbines compared to the original turbines is not apparent. There is a horizontal extension of the Paul's Hill array created by the proposed turbines. The distance of the viewer provides some mitigation. *Duration and Reversibility:* ***Long*** term theoretically ***reversible*** change *Overall Magnitude of visual change:* ***Slight.*** Magnitude of visual change causing a perceptible change in the view as a result of the addition of new features which alters the composition of a narrow part of the overall panoramic view. The limited angle of view affected and the screening of most of the full tower heights offers some integration with the existing cumulative baseline. Changes would be long term but theoretically reversible.
Magnitude of Cumulative Change
Slight Magnitude of Cumulative Change in respect of the existing/consented developments (scenario 1). No additional change for scenarios 2 and 3, owing to distance of other developments and clear separation from the proposed Paul's Hill II turbines. Magnitude of cumulative change remains at ***Slight***.
Visual Effect
Moderate and ***Not Significant.*** Considered not significant owing to the limited portion of the view affected, the distance from the viewer, and the mitigating screening factors of the full height of the proposed turbines, although considered a borderline not significant owing to the high sensitivity of the viewpoint, being of national importance. Overall, despite the sensitivity, the level of change experienced from this viewpoint is not considered to be an unacceptable change.
Cumulative Visual Effect
Moderate and ***Not Significant*** for scenario 1 developments. Cumulative visual effect remains ***moderate,*** with ***no additional change*** for scenarios 2 and 3 developments.

Viewpoint 9

Table 6.32: Viewpoint 9 Assessment

Viewpoint 9: A95 between Aberlour and Ballindalloch
Location
This Viewpoint is located 10.7 km to the east of the proposed Paul's Hill II Wind Farm development at an elevation of 193 m AOD. It is situated within the Broad Farmed Valley LCT (MN7) of Morayshire. It is taken from the grass verge of the A95 south west of the access road to Rinnachat cottages and the first open stretch of road route southbound from Aberlour along the A95. It is representative of views obtained from the A95 transport route. In addition, nearby receptors include the residential properties accessed off this road route. However most residential properties are set within established garden grounds or partially enclosed by shelterbelt plantings. The Speyside Way diverges substantially at this point from the A95 and so this viewpoint is not representative of potential views from along this long distance footpath.
Sensitivity
Value of the view: ***Medium***. Views of local importance recognised by local landscape designation of the Spey Valley AGLV. *Susceptibility:* ***Medium***. Nearby residents, although mostly oblique views toward the proposed development, travellers along the A95 route with oblique views although this is a fast road and the viewer's attention is generally less focussed on the landscape and more of travel between destinations. *Overall Sensitivity:* ***Medium*** sensitivity of this viewpoint as residents experience oblique and mostly filtered views through vegetation and the principle focus along this fast connecting A road is that of travel.
Existing View
Clear views westwards across the open slopes of the valley pastures across to the forested summit of Drum Wood toward the rolling uplands and Roy's Hill on the distant skyline to the right hand side of Drum Wood. An electricity connection is visible in the foreground as a series of receding wooden poles. The upper parts of up to 5 of the existing Paul's Hill turbines are visible from this viewpoint, stretching along the landform of Carn Shalag on the skyline. The full tower heights are obscured by the intervening landform. Part of the existing Paul's Hill access track is visible on this east facing slope as a pale crescent shape cut into the grassy moorland. Berryburn turbines are theoretically visible as blade tips but in reality at a distance of 14.5 km from the viewer, are not perceptible. Rothes I and II developments are screened by the Wood of Rinnachat and the blade tips of the existing Hill of Towie development theoretically visible to the east are also screened by further intervening vegetation. As the view progresses southwards the settled valley landscape with well-defined field boundaries and small hamlets and property groups is contained by the distinctive peaks of Little Conval and Meikle Conval. The full southern view culminates in the rounded summit of Ben Rinnes. No existing wind farm developments are present in the southerly direction allowing uninterrupted views of these attractive peaks.
Predicted View (including cumulative baseline 1)
The predicted operational view is depicted in Figure 6.14j. Nacelles of 6 of the 7 Paul's Hill II turbines are theoretically visible from this viewpoint on the distant skyline. The proposed turbines are located on the lower northern slopes of Roy's Hill and therefore not screened from this direction by the landform. Their position does relate to the existing access road. The proposed turbines are closer to the viewer and appear larger as they are taller to blade tip than the existing Paul's Hill turbines, but the proposed turbine are arranged on either side of the existing development creating a greater depth of turbine development and slightly extending the Paul's Hill development along the horizontal plane. The southern view remains unchanged, allowing full open views across the valley landscape toward the distinctive peaks of Ben Rinnes, Little Conval and Meikle Conval. There is no relationship with any other existing development in the overall view. Overall, the openness of the view is retained and there is a noticeable visual change to the skyline.

Viewpoint 9: A95 between Aberlour and Ballindalloch
Predicted Cumulative View
No other scenario 2 or scenario 3 wind farm developments are actually visible from this viewpoint. There will be no cumulative effects over and above those identified in the LVIA assessment.
Magnitude of Change
Geographical Extent: ***Medium*** Clear, though oblique view for some distance along this sequential route.
Size and Scale: ***Moderate***. Difference in scale of Paul's Hill II turbines and original turbines is apparent but some visual integration owing to the overlapping of the two schemes and narrow portion of view affected.
Duration and Reversibility: ***Long term*** theoretically ***reversible*** change
Overall Magnitude of visual change: ***Moderate*** Magnitude of visual change causing a noticeable change in the view as a result of the additional of new features on the skyline. Horizontal overlapping of original and proposed turbines allow some integration with existing cumulative baseline but some visual contrast in developments. Changes would be long term but theoretically reversible.
Magnitude of Cumulative Change
Moderate Magnitude of Cumulative Change in respect of the existing/consented developments (scenario 1). ***No additional change*** for scenario 2 and 3.
Visual Effect
Moderate and ***Not Significant***. Considered not significant owing to the limited angle of view affected and the retention of the key view across the pastoral valley landscape toward the distinctive peaks of Ben Rinnes and Little and Meikle Conval.
Cumulative Visual Effect
Moderate and ***Not Significant*** for scenario 1 developments***. No additional cumulative visual effect*** for scenario 2 and 3.

Viewpoint 10

Table 6.33: Viewpoint 10 Assessment

Viewpoint 10: A95 Memorial at Junction with B9008
Location
This Viewpoint is located 7.5 km to the south east of the proposed Paul's Hill II Wind Farm development, at an elevation of 191 m AOD. It is situated within the Broad Farmed Valley LCT (MN7) of Morayshire. It is taken from the grass verge between the memorial and the carriageway of the A95. It is representative of views obtained from the A95 transport route as it turns the sharp corner to the west of Ballindalloch Castle entrance (views from Ballindalloch Castle, Dovecot and Grounds are considered in Chapter 9: Cultural Heritage). The Speyside Way also follows this route at this point. In addition, nearby receptors include the residential property of Glen A'an.
Sensitivity
Value of the view: ***Medium***. Views of local importance recognised by local landscape designation of the Spey Valley AGLV and the recognition as a long distant walking footpath and tourist route of the Speyside Way.
Susceptibility: ***High***. Nearby residents, Travellers along the A95 route and Speyside Way with direct views in the direction of travel westwards. The attention of travellers along the A95 are generally less focussed on the landscape and more on travel between destinations. The attention of those travelling along the Speyside Way, particularly in open stretches with long views, is on the landscape.

Viewpoint 10: A95 Memorial at Junction with B9008
Overall Sensitivity: ***Medium*** sensitivity of this viewpoint as residents restricted to one property owing to intervening vegetation, and although the attention of Speyside Way travellers is focussed on the landscape, The attention of travellers along the A95 are generally less focussed on the landscape and more on travel between destinations, particularly in the area of this hazardous road corner.
Existing View
Clear views north westwards across this narrower wooded section of the Spey Valley, west of Ballindalloch. The foreground view is of the carriageway of the A95 and the Delnashaugh Hotel which sits lower than the road and viewer, set in woodland. The view takes in the forested summit of Hill of Dalnapot and the open moorland of Roy's Hill, visible on the skyline to the right hand side with the extensive rolling moorland extending to the left hand side of the forested Hill of Dalnapot. The roadside batters are visible on the edge of the view, covered in grassland mix, broom and gorse. Paul's Hill I Wind Farm is visible as 6 clear nacelles and towers emerging from behind the Hill of Dalnapot and centred on the Paul's Hill landform. Sweeping east and southwards, the view takes in the A95 carriageway and the junction with the B9008, where the memorial is located. These structures obscure visibility toward the rounded summit of Cairnacay. Sweeping back round toward the Delnashaugh Hotel, the view takes in the nearby summit of Craggan More which dominates this south-western view.
Predicted View (including cumulative baseline 1)
The predicted operational view is depicted in Figure 6.14k. The nacelles of 2 of the 7 Paul's Hill II turbines, turbine nos. 6 and 7 which are the most southerly located of the proposed turbines are theoretically visible from this viewpoint on the skyline, together with 2 very edge of blade tips. However, owing to the intervening landform, the 2 blade tips are not perceptible in the predicted view. The rest of the turbines are screened by Roy's Hill. The proposed turbines extend the horizontal array of the existing Paul's Hill turbines and are theoretically located amidst original Paul's Hill turbine blade tips. However, these tips are not perceptible above the intervening landform, resulting in a gap between the existing and proposed Paul's Hill turbines. The proposed turbines do appear as a separate development which makes more visual sense in this context, owing to the proximity of the viewer and the obvious contrast in turbine size. Owing to the landform containment of this viewpoint no other existing wind farm is visible. Overall, the openness of the view is retained and owing to the movement of the turbines, there is a noticeable visual change to the skyline.
Predicted Cumulative View
Owing to the landform containment of this viewpoint no other scenario 2 or scenario 3 wind farm developments are visible from this viewpoint. There will be no cumulative effects over and above those identified in the LVIA assessment.
Magnitude of Change
Geographical Extent: ***Small.*** Clear, direct view for a short stretch of road while it remains elevated above intervening landform and woodland. Much of the A95 is visually enclosed by landform, built structures or roadside vegetation allowing glimpsed outward views such as this viewpoint. A small angle of the overall view is affected.
Size and Scale: ***Moderate***. Difference in scale of Paul's Hill II turbines and original turbines is apparent but narrow portion of view affected.
Duration and Reversibility: ***Long term*** theoretically ***reversible*** change
Overall Magnitude of visual change: ***Moderate*** Magnitude of visual change causing a noticeable change in the view as a result of the additional of new features on the skyline. Visual contrast in developments. Changes would be long term but theoretically reversible.
Magnitude of Cumulative Change

Viewpoint 10: A95 Memorial at Junction with B9008
Moderate Magnitude of Cumulative Change in respect of the existing/consented developments (scenario 1). ***No additional change*** for scenario 2 and 3.
Visual Effect
Moderate and ***Not Significant***. Considered not significant owing to the limited angle of view affected and the visibility of only 2 of the 7 proposed turbines.
Cumulative Visual Effect
Moderate and ***Not Significant*** for scenario 1 developments***. No additional cumulative visual effect*** for scenario 2 and 3.

Summary of Effects on Selected Viewpoints

6.9.27 One out of the ten selected viewpoints has been identified as potentially experiencing ***Moderate*** and ***Significant*** visual and cumulative effects for cumulative baseline 1 (operational wind farm developments). Viewpoint 1, taken from the frontage of Tormore Distillery is a close proximity viewpoint at 5.9 km from the proposed development. The susceptibility of the viewers, or receptors present at this viewpoint was considered to be ***High,*** as they included residents and tourists focussed on the landscape. This resulted in a ***Medium*** (borderline with High) overall sensitivity. The ***Moderate*** magnitude of change at this viewpoint was largely based on the moderate contrast present between the different turbine sizes of the proposed and original Paul's Hill turbines and the small geographical extent of visibility, both in the angle of view affected, and the duration of visibility along the sequential route, as this is one of the few occurrences of visibility of the proposed development from the A95 road route. When combined with this higher level of susceptibility, a moderate effect was determined which was considered high enough to be a significant effect. However, the effect was not considered sufficient to be a moderate/Major effect as the view is an oblique view when travelling along the A95, and both the original and proposed Paul's Hill schemes overlap, creating some visual integration making visual sense of the proposed development as an extension of the existing. The overall openness of the view is also retained and only a small part of the skyline is changed by the presence of additional features. These mitigating factors lead to the conclusion that this significant effect, experienced by receptors at a distance of 6 km from the proposed development is an acceptable and localised significant effect.

6.9.28 A further seven of the remaining nine viewpoints were considered to experience a ***Moderate*** level of effect which have been considered in each case to represent a not significant effect. These include the summit viewpoints of Ben Aigan, Ben Rinnes, Carn a Ghille Chearr and Carn Diamh, the settlement view from Archiestown and the A95 viewpoints 9 and 10 west of Aberlour and west of Ballindalloch. The summit viewpoints represent high sensitivity receptors such as walkers who have a strong focus on experiencing the wider landscape view. Owing to distance from the proposed development, some visual integration with the existing Paul's Hill turbines and partial screening from intervening landform, the magnitude of change predicted from these elevated viewpoints is considered to be ***slight*** with a perceptible change occurring as a result of the proposals. It is considered that such lower levels of change result in a not significant effect on these viewpoints.

6.9.29 The road route viewpoints are all considered to experience a ***moderate*** and noticeable level of change as a result of the proposed development

6.9.30 . This largely resulted from the visibility of 'stacked' turbines, overlapping each other and/or a more noticeable contrast between the different sizes proposed for the Paul's Hill II turbines from those currently present on site at Paul's Hill. However these viewpoints and associated receptors were considered to be of medium sensitivity, generally more locally valued and with less focus on the wider landscape and more on travelling between destinations. Overall, the small angle of each view affected and the localised nature of these effects is considered to result in not significant effects on the experience at these viewpoints.

6.9.31 In the case of viewpoint 7, a ***Major*** level of size and scale was identified as part of the overall ***moderate*** magnitude of change, largely as a result of the close proximity viewpoint and the higher level of contrast between the two turbine types. However, a ***Low*** sensitivity from a local, undesignated minor road with no immediate residential properties results in a ***Minor/Moderate*** and ***not significant effect***, mainly due to the short duration of this view.

6.9.32 It is noted there are no additional cumulative effects for baseline scenarios 2 and 3, consented and proposed developments. In the cases of Viewpoints, 2 – Ben Aigan, Viewpoint 3 – Ben Rinnes and Viewpoint 4 – Dallas to Knockando Road, the overall level of effect is considered to diminish, owing to the prominence of other consented or proposed wind farm developments in each view.

6.9.33 No unacceptable significant effects are predicted to be experienced by visual receptors at any of the selected viewpoints.

Effect on residential receptors

6.9.34 As identified in Section 6.7, residential receptors are divided into settlements and individual residential properties close to the proposed development within the agreed study area of 3km from the outer turbine edge of Paul's Hill II Wind Farm development. The assessment of the effect on residential properties, both within settlements and as individual properties, considers the overall visual amenity of the properties and is referred to as the Residential Visual Amenity Assessment (RVAA).

6.9.35 Other effects on residents are considered in other parts of the ES. Noise impacts are assessed in Chapter 13: Human Health and Population, for example.

6.9.36 The aim of this Residential Visual Amenity Assessment (RVAA) is to identify, predict and evaluate potential key effects on the visual component of residential amenity as experienced by local residential properties as a result of the introduction of the proposed development. This assessment focuses on the effect on the visual component of residential amenity only and does not consider other components such as noise, dust, shadow flicker etc. The assessments of these effects are contained in other sections of this ES.

6.9.37 For properties considered to experience a substantial or moderate magnitude of visual change, this assessment evaluates the potential effects on the visual component of residential amenity or 'living conditions'. The visibility of existing and under construction wind farms considered as scenario 1 cumulative developments are taken into account as part of the existing visual baseline. Potential cumulative effects are also assessed with other consented (scenario 2) and proposed (scenario 3) wind farms.

Effect on individual residential properties

6.9.38 The three individual residential properties included in the RVAA are located as shown in Figure 6.6 Residential Receptors and are assessed in Table 6.34, Table 6.35 and Table 6.36.

6.9.39 The overall sensitivity of each property is judged to be ***High*** as residential receptors represent high value receptors with a high susceptibility to visual change owing to their fixed position. The visibility of the proposed development includes visibility from the property and its curtilage and immediate parts of the access road to each property.

Property 1

6.9.40 The property of Glenarder is located on the lower north-eastern slopes of Roy's Hill at an approximate elevation of 212m AOD. An indicative view of the property, but facing in the opposite direction to the proposed development is shown in Photographic Figure 6.2 below. Potential wireline views of the proposed Paul's Hill II development from the property itself are shown in Figure 6.7a Residential Wireline RRVP01 Glenarder

Photographic Figure 6.2: Illustrative Photograph of Glenarder property taken looking north eastwards towards the property from along the Corglass Farm access road, leading from the B9102.

Table 6.34: Assessment of potential effects on the property of Glenarder

Individual Property 1: Glenarder
Description of Property
This property is located 2.5 km to the east of the proposed Paul's Hill II Wind Farm development, at an elevation of 212 m AOD. It is situated within the Broad Farmed Valley LCT (7) of Morayshire. The property is a one and a half storey stone and slate house with a southern extension and a main frontage elevation facing west which is largely open. Opposite the residential house, across an open yard and parking area is a large outbuilding of wood and corrugated roof construction. Scrub vegetation lines the access track to the property and more managed garden vegetation is located to the south of the property.
Existing View (including cumulative baseline 1)
Clear views westwards from the property and curtilage currently have no visibility of operational turbines but rather take in the level foreground of rough grassland which surrounds the property to the south and west and look along the minor valley of Allt Arder with mixed rough and wet grassland and scrub riparian vegetation. The descending moorland slopes of Roy's Hill form the western limit of visibility in the middle distance. Both the original operational Paul's Hill I and the Berryburn turbines are not visible owing to the screening landform of Roy's Hill. Rear views eastwards theoretically include visibility of the operational Hill of Towie turbines as a line of turbines on the distant horizon looking along the Spey Valley. In reality localised landform and vegetation would further restrict views of the Hill of Towie turbines. Views are relatively open on three sides of the property with only eastern views along the Spey Valley experiencing some enclosure from localised landform and vegetation.

Individual Property 1: Glenarder
Predicted View (including cumulative baseline 1)
The predicted operational view of the proposed Paul's Hill II Wind Farm development is depicted in Figure 6.7a. The nacelles of 2 of the 7 Paul's Hill II turbines, turbine no's. 1 and 2 which are the most northerly located of the proposed turbines located at the lowest elevations are visible from this viewpoint above the descending slopes of the Roy's Hill landform. In addition 3 blade tips, 2 of which are the very edge of the blade tips of turbines set further 'back' and away from the viewer which would be theoretically visible, but in reality it is predicted that in addition to the 2 turbine hubs that only the blade tip of turbine 4, which is closer to the viewer is likely to be actually visible above the heather moorland slopes. The rest of the turbines are screened by Roy's Hill. The proposed turbines do appear as a new development emerging from 'behind' the tail end slopes of Roy's Hill at a close proximity of 2.5 km from the viewer. Owing to the movement of the turbines, there is a noticeable visual change to the skyline. Overall, the openness of the view along the Allt Arder Valley would be retained.
Predicted Cumulative View
Owing to the landform containment of this viewpoint no other scenario 2 or scenario 3 wind farm developments are perceptibly visible from this viewpoint. There will be no cumulative effects over and above those identified in the LVIA assessment.
Magnitude of Change
Geographical Extent: ***Small.*** Where visible, the proposed development would affect only a narrow portion of overall vista from the property. *Size and Scale:* ***Moderate***. A moderate degree of contrast of the new features with the existing undeveloped skyline. Narrow portion of skyline affected and general openness of view retained. Blade movement would be a noticeable feature. *Duration and Reversibility:* ***Long term*** theoretically ***reversible*** change *Overall Magnitude of visual change:* ***Moderate*** Magnitude of visual change causing a noticeable change in the view as a result of the additional of new features on the skyline. Changes would be long term but theoretically reversible. Overall openness and visibility of the remaining undeveloped skyline of Roy's Hill which takes up the south-western elevation view from the property would remain unaffected.
Magnitude of Cumulative Change
Moderate Magnitude of Cumulative Change in respect of the existing/consented developments (scenario 1). ***No additional change*** for scenario 2 and 3.
Visual Effect
Moderate/Major and ***Significant effect***. Considered significant owing to high level of sensitivity of the residential viewer, the noticeable movement of blades on the currently undeveloped skyline and the close proximity of the viewer together with lack of screening or filtering of view towards Roy's Hill. Significant effect affecting a limited angle of overall view and there would be actual visibility of parts of only 3 of the 7 proposed turbines.
Cumulative Visual Effect
Moderate/Major and ***Significant*** for scenario 1 developments owing to the visibility of Pauls Hill II by itself***.*** ***No additional cumulative visual effect*** for scenario 2 and 3.
Effect on the visual component of living conditions
The magnitude of change at this location is judged to be moderate. An assessment of potential effects on the visual component of living conditions has therefore been considered. The current visual experience from this property takes in open rough grassland immediately surrounding the property with scattered scrub vegetation and the subtle depression of the Allt Arder Valley and associated scrub woodland visible from the yard area

Individual Property 1: Glenarder
within the property curtilage and from the main front windows. The lower slopes of Roy's hill form a visual 'stop' to the slightly oblique south-western view from the property windows. The addition of two visible new turbine features emerging from behind this enclosing landform will change a small part of this containing skyline view, but it is not considered these would be dominant features owing to the only partial view of the development and the separation of open grassland immediately around the property and the retention of open northern views across the Allt Arder Valley, particularly from the open yard area. The proposed development is therefore not predicted to dominate the Glenarder property or curtilage but will change a small part of the skyline to a moderate degree with moving blades causing a noticeable change that is not anticipated to significantly affect the overall visual amenity of living in this property.

Property 2

6.9.41 The property of Corglass Farm is located on the lower north-eastern slopes of Roy's Hill at an approximate elevation of 261m AOD. An indicative view of the property, taken from the access gate into the property curtilage, but not facing in the same direction as the proposed development, is shown in Photographic Figure 6.3 below. Potential wireline views of the proposed Paul's Hill II development from the property itself are shown in Figure 6.7b Residential Wireline RRVP02 Corglass Farm Building Group and more detailed photowires are shown in RRVP04 Corglass Farm Holiday Cottage and RRVP05 Corglass Farm Parking Area.

Photographic Figure 6.3: Illustrative Photograph of Corglass Farm property taken looking north westwards towards the property from along the Corglass Farm access road, leading from the B9102.

Table 6.35: Assessment of potential effects on the property of Corglass Farm

Individual Property 2: Corglass Farm Building Group
Description of Property
This property group is located 1.5 km to the east of the proposed Paul's Hill II Wind Farm development, at an elevation of 261 m AOD. It is situated within the Open Rolling Upland LCT (11) of Morayshire. The building group consists of a single owner occupied one and a half storey stone and slate house(main property) with separate outbuildings of mixed stone and steel construction located to the south-west, (in front of the viewer at the main access gate). The main property has a frontage south-eastern elevation of. A second, temporary residence used as a holiday let property is located to the rear of the property curtilage to the north. Both properties are centred on an open yard area with a dense strip of mixed woodland along the south-western boundary of the property curtilage. Additional sporadic stands of vegetation are scattered throughout the curtilage.
Existing View (including cumulative baseline 1)
Relatively open views east-south-eastwards from the property and curtilage along the Allt Arder Valley across mixed rough and wet grassland and scrub riparian vegetation toward the property of Glenarder. There is currently no visibility of operational turbines as both the original operational Paul's Hill I and the Berryburn turbines are not visible owing to the screening landform of Roy's Hill. Dense mixed woodland along the south-western perimeter of the main property wraps around the south-west of the properties and limit views of the currently undeveloped moorland slopes of Roy's Hill. Theoretical views along the shallow valley toward the operational Hill of Towie I Wind Farm on the distant hills, which in reality are barely discernible.
Predicted View (including cumulative baseline 1)
The predicted theoretical operational view of the proposed Paul's Hill II Wind Farm development is depicted in Figure 6.7b, 6.7d and 6.7e. The nacelles of 3 of the 7 Paul's Hill II turbines, turbine no's. 1, 2 and 4 which are the most easterly located of the proposed turbines located at the lowest elevations are theoretically visible from this viewpoint above the descending slopes of the Roy's Hill landform. In addition 2 blade tips of turbine no's. 3 and 5 which are set further 'back' and away from the viewer would be theoretically visible. In realitythis view depicted in Figure 6.7d would be possible from the more open north-western boundary where the temporary residence and holiday let is located. As demonstrated by Figure 6.7e, the photowire from the parking area 'behind' the main property shows substantial filtering of potential views of the proposed development through the dense vegetation screening along the south-western perimeter of the property curtilage. This photowire shows the winter situation where the branches provides some filtering but allows glimpsed views of turbine nrs 1 and 2 only with coniferous planting screening all other theoretically visible turbines. In Spring and summer, however, leaf growth would allow more dense screening and even more substantial filtering of views. The rest of the turbines are screened by Roy's Hill. Where visible, mostly from the access road, and from the relatively unscreened north western boundary and holiday let property, the proposed turbines do appear as a new development emerging from 'behind' the tail end slopes of Roy's Hill at a close proximity of 1.5 km from the viewer. Owing to the movement of the turbines, where they are visible, there would be a substantial visual change to the skyline. From within the curtilage of the property itself, such as the main property and main parking area, it is predicted that visibility would likely be reduced by dense mixed woodland which would provide some degree of screening year round. Overall, the openness of the view along the Allt Arder Valley would be retained.
Predicted Cumulative View
Owing to the landform containment of this viewpoint no other scenario 2 or scenario 3 wind farm developments are perceptibly visible from this viewpoint. There will be no cumulative effects over and above those identified in the LVIA assessment.
Magnitude of Change

Individual Property 2: Corglass Farm Building Group
Geographical Extent: ***Small.*** Where visible, the proposed development would affect a medium portion of the overall vista from the holiday let property, but would be experienced from a small area of the overall property curtilage.
Size and Scale: ***Major.*** Where visible, ahigh degree of contrast of the new features would be potentially experienced but with mostly filtered views across most parts of the property curtilage. Where the wind farm would be visible largely from unscreened sections of the approaching access road or through gaps in the screening vegetation surrounding the property curtilage and from the holiday let property, it is predicted a major size and scale element would be considered. However the screening effect may produce more of a Minor degree of Size and Scale of Magnitude from the main property itself and moderate degree of size and scale of magnitude across most other parts of the property curtilage, such as the main parking/yard area. Relatively narrow portion of skyline affected and general openness of existing views retained. Blade movement would be a prominent feature where visible, outwith vegetation screening.
Duration and Reversibility: ***Long term*** theoretically ***reversible*** change
Overall Magnitude of visual change: ***Moderate*** Magnitude of visual change which represents the balance between the worst case scenario experienced from the holiday let property and unscreened northern boundary and the heavily filtered views from the main property and most of the rest of the property curtilage. Changes would be long term but theoretically reversible.
Magnitude of Cumulative Change
Moderate Magnitude of Cumulative Change in respect of the existing/consented developments (scenario 1) owing to the visibility of the proposed development by itself. ***No additional change*** for scenario 2 and 3.
Visual Effect
Major and ***Significant***. Some potential for Major effect from open areas of the approach road and from unscreened northern boundary and temporary holiday let residence. However mitigating factors including the limited angle of view affected and the heavily filtered views through dense mixed woodland screening across the rest of the property including the main property residence itself lead to this being considered an acceptable significant effect. Even in the event that trees around the curtilage of the property were removed, it is still considered that the visual effect from the property, due to the carefully designed layout, would be an acceptable significant effect.
Cumulative Visual Effect
Moderate/Major and ***Significant*** for Scenario 1 developments owing to potential visibility of the proposed development by itself***. No additional cumulative visual effect*** for Scenarios 2 and 3.
Effect on the visual component of living conditions
The overall magnitude of change at this location is judged to be moderate. An assessment of potential effects on the visual component of living conditions has therefore been considered. The current visual experience from this property takes in open rough grassland immediately surrounding the property with scattered scrub vegetation and the subtle depression of the Allt Arder Valley and associated scrub woodland visible from the yard area within the property curtilage and from the main front windows of the main property. The dense established screen of mixed Rowan, Birch and Scots Pine shelterbelt along the southern perimeter of the property heavily filters the theoretical view toward the site substantially limiting any visual effect from the properties themselves. The theoretical view as shown in Figure 6.7e would be actually visible from along parts of the access road from breaks in the vegetation. From here, the addition of three visible new turbine features and small parts of two moving blades emerging from behind this enclosing landform will change a small part of this containing skyline view, but it is not considered these would be dominant features across the whole property curtilage, owing to the limited geographical extent of any higher levels of visual change, together with the oblique angle this would be experienced from the access road. The open south-eastern views, particularly from the main property across the Allt Arder Valley would also remain unaffected. The proposed development is therefore not predicted to dominate the Corglass Farm properties or curtilage but will change a small to moderate part of the skyline with moving blades only causing a substantial change from a small area of the curtilage and from a temporary residence. The main property and well utilised yard area which represents the core of the property activity would experience a more slight to moderate magnitude of visual change resulting in more moderate visual effects that are not anticipated to significantly affect the overall visual amenity of living in this property.

Property 3

6.9.42 The property of Leakin Farm is located on the lower southern slopes of Hill of Slackmore at an approximate elevation of 173m AOD. An indicative view of the property, and facing slightly away from the direction of the proposed development, is shown in Photographic Figure 6.4 below. Potential wireline views of the proposed Paul's Hill II Wind Farm development from the property itself are shown in Figure 6.7c Residential Wireline RRVP03 Leakin Farm Building Group.

Photographic Figure 6.4: Illustrative Photograph of Leakin Farm property taken looking west-north-westwards towards the property from along the Garlinemore and Leakin Farm access road, leading from the B9102.

Table 6.36: Assessment of potential effects on the property of Leakin Farm Building Group

Individual Property 1: Leakin Farm Building Group
Description of Property

Individual Property 1: Leakin Farm Building Group

This property is located 4.3 km to the east-north-east of the proposed Paul's Hill II Wind Farm development, at an elevation of 173 m AOD. It is situated within the Upland Moorland and Forestry LCT (10) of Morayshire. The property is a one and a half storey stone and slate house with attached outbuildings and a main frontage elevation facing south-east which is largely open with minimal garden and hedge planting enclosing a front garden. The partially gravelled private access road is largely open with periodic accesses into open fields surrounding the farm complex. The north western elevation is largely enclosed by landform with juvenile planting which blends into established deciduous riparian woodland associated with the lower slopes of Allt Arder Valley.

Existing View (Including cumulative baseline 1)

Clear views south-eastwards from the property and curtilage across open improved pastures toward the property of Garlinemore and the Spey Valley beyond. There is currently some theoretical visibility of operational turbines as the original operational Paul's Hill I turbines are theoretically visible as a line of 3 nacelles and a further 5 set of blade tips with the rest of the Paul's Hill I turbines being screened by the slopes of the Roy's Hill landform. Deciduous woodland to the south-west of the Leakin property intercepts views toward the Paul's Hill Wind Farm and in reality views of the operational turbines are screened. No other operational turbines are visible throughout the 360 degree view from the property curtilage.

Predicted View (including cumulative baseline 1)

The predicted theoretical operational view of the proposed Paul's Hill II Wind Farm development is depicted in Figure 6.7c. The nacelles of 5 of the 7 Paul's Hill II turbines, turbine no's. 1, 2, 4, 5 and 6 which are the most easterly located of the proposed turbines are theoretically visible from this viewpoint above the descending slopes of the Roy's Hill landform. In addition 2 blade tips of turbine no's. 3 and 7 which are set further 'back' and away from the viewer would be theoretically visible. The rest of the turbines are screened by Roy's Hill. The proposed turbines are larger and closer to the viewer and in reality, although the woodland to the south west of the property curtilage would largely intercept views toward the proposed development it is likely some visibility of the upper tips of the proposed turbines may be visible above the vegetation due to the descending slope and elevated position of Leakin Farm. Some clearer views would also be possible from along the access road, particularly as the track emerges (heading towards the property) from Scots Pine woodland, with dense deciduous understorey adjacent to it, located between Garlinemore and Leakin Farm. The separation of the receptor from the proposed development does reduce the magnitude of visual change as the view towards the development site takes in the shallow Allt Arder Valley and the extensive grasslands on the southern bank in the vicinity of the Glenarder property. Where visible, mostly from the access road, the proposed turbines do appear as a closer new development emerging from 'behind' the tail end slopes of Roy's Hill. Owing to the movement of the turbines, there would be a noticeable visual change to the skyline. From within the curtilage of the property itself it is predicted that visibility would be reduced by existing woodland which would provide some degree of seasonal screening. The openness of the south-eastern view across the Spey Valley would remain unaffected.

Predicted Cumulative View

Owing to the landform containment of this viewpoint no other scenario 2 or 3 wind farm developments are visible from this viewpoint. There will be no cumulative effects over and above those identified in the LVIA assessment.

Magnitude of Change

Geographical Extent: ***Small.*** Where visible, the proposed development would affect only a narrow portion of overall vista from the property.

Size and Scale: ***Minor***. A slight degree of contrast of the new features owing to the partially screened view across existing woodland to the south west. Where the wind farm would be visible largely from unscreened sections of the approaching access road, it is predicted a moderate size and scale element would be

Individual Property 1: Leakin Farm Building Group

considered. Narrow portion of skyline affected and general openness of south-eastern view retained. Blade movement would be a noticeable feature where visible, outwith vegetation screening.

Duration and Reversibility: ***Long term*** theoretically ***reversible*** change

Overall Magnitude of visual change: ***Slight*** Magnitude of visual change causing a perceptible change in the view as a result of the additional of new features on the skyline which would only be visible from within the curtilage across partially screening vegetation. Changes would be long term but theoretically reversible.

Magnitude of Cumulative Change

Slight Magnitude of Cumulative Change in respect of the existing/consented developments (scenario 1). ***No additional change*** for scenario 2 and 3.

Visual Effect

Moderate and ***borderline Significant***. Considered significant owing to the high level of sensitivity and potential for partial visibility from within curtilage. Considered borderline owing to the separation of the property from the proposed development, the limited angle of view affected and the partial screening of views across existing woodland screening. Some potential for Moderate/Major effect from open areas of the approach road which leads to a conclusion of potentially significant, albeit borderline significant effect.

Cumulative Visual Effect

Moderate and ***borderline Significant*** for scenario 1 developments owing to the potential visibility of the proposed development by itself***. No additional cumulative visual effect*** for scenario 2 and 3.

Effect on the visual component of living conditions

The magnitude of change at this location is judged to be slight. An assessment of potential effects on the visual component of living conditions has therefore been considered. The current visual experience from this property takes in open improved grassland immediately surrounding the property with enclosing riparian woodland located to the south-east of the property intercepting views in this direction toward the proposed Paul's Hill II Wind Farm development. The main front windows face south-east and would retain open views across the Spey Valley with partially screened oblique angle views possible from the outer yard areas and along parts of the access road where views would be more in the direction of travel. From where it is visible, it is not considered the proposed turbines would be dominant features owing to the separation of the distance of over 4 km and the only partial view of the development, together with the oblique angle this would be experienced from the yard and property areas. The open south-eastern views across the Spey Valley would also be retained. The proposed development is therefore not predicted to dominate the Leakin Farm property or curtilage but will change a small part of the skyline to a slight degree with moving blades causing a perceptible change where visible that is not anticipated to significantly affect the overall visual amenity of living in this property.

Summary of Effects on Individual Residential Receptors

6.9.43 Potential ***Major*** level visual effects have been identified from the Corglass Farm property mainly from open areas of the approach road and from unscreened northern boundary and temporary holiday let property within this property group. However, mitigating factors including the limited angle of view affected, the temporary nature of this residence and the heavily filtered views through dense mixed woodland screening across most of the rest of the property curtilage including the main property itself. This leads to this being considered an acceptable significant effect. Even in the event that trees around the curtilage of the property were removed, it is still considered that the visual effect from the property, due to the carefully designed layout, would be an acceptable significant effect.

6.9.44 A ***Moderate/Major*** level of visual effect has been identified from the Glenarder property owing to the proximity of the property to the proposed development, the high level of sensitivity and the clear uninterrupted visibility of the noticeable change to a currently undeveloped skyline. However the angle of overall view affected is very limited and open views remain in other directions from the property mainly along the Allt Arder Valley which, it is considered, mitigates this effect to an acceptable effect.

6.9.45 A Moderate level of effect has been identified from the Leakin Farm property, owing to potential views from within the curtilage and are considered a ***Significant effect*** owing to the high level of sensitivity of this residential receptor. However this is considered to be a borderline significant effects owing to the limited actual visibility throughout the curtilage of the property, together with the limited angle of view affected and the oblique angle of viewing.

6.9.46 No significant effects on the visual component of living conditions have been identified from any of the three assessed properties and their curtilages in this RVAA. Some major and ***moderate/major*** and significant levels of visual effect have been identified from parts of the access roads to Corglass and Leakin Farms owing to a lack of screening and in the case of Corglass Farm, the proximity to the proposed development. These effects are highly localised and when travelling by car would be of short duration.

6.9.47 Overall two significant effects and one borderline significant effect are identified from individual and isolated properties within 3 km of the proposed development. However screening, the carefully designed layout and the localised nature of these effects mitigate these effects which are assessed as not significantly affecting the overall visual component of living conditions for any of these three properties.

Effect on settlements

6.9.48 The four settlements included in the VIA are located as shown in Figure 6.8 Settlement Receptors and are assessed in Table 6.37, Table 6.38, Table 6.39 and

6.9.49

6.9.50 Table 6.40.

6.9.51 The overall sensitivity of each settlement is judged to be ***High*** as residential receptors represent high value receptors with a high susceptibility to visual change owing to their fixed position.

Archiestown

6.9.52 The settlement of Archiestown is located toward the edge of the Broad Farmed Valley LCT 7 at its' transition with the Upland Moorlands and Forestry LCT 10 on the lower slacker slopes of Hunt Hill. It is surrounded by extensive forestry plantations to the north which cover the southern slopes of Hunt Hill and the eastern slopes of Carn na Cailliche and Monahoudie Moss to the west. The settlement itself is a planned settlement with a grid iron pattern and lines of mature deciduous trees along the main central street which follows the B9102 as shown in Photographic Figure 6.5. This image is taken looking Iin the approximate direction of the proposed development and approximately 200m further east along the central street from the location of the settlement wireline SVP01 in Figure 6.8a which indicates the theoretical view of the proposed development from within the village itself. Visualisation 6 in Figure 6.14f also indicates the potential view from a selected viewpoint on the southern edge of the Archiestown settlement as detailed in Table 6.37.

Photographic Figure 6.5: Illustrative Photograph looking westwards from along the B9102 from within Archiestown.

Table 6.37: Assessment of potential effects on the settlement of Archiestown

Settlement: Archiestown
Description of Settlement
This settlement is located 9.3 km to the north-east of the proposed Paul's Hill II Wind Farm development.. It is situated within the Broad Farmed Valley LCT (MN7) of Morayshire at the transition with the extensively forested LCT10 Upland Moorland and Forestry. Archiestown is a planned grid iron pattern settlement based around the central street which follows the route of the B9102. An avenue of mature deciduous specimen trees line the main street and main central square around the war memorial. Properties within the settlement range from single storey to one and half and two storey properties, with some of the commercial establishments such as Archiestown Hotel being a two and a half storey property. Most properties are of the vernacular stone and slate style construction.
Existing View (Including cumulative baseline 1)
Views from within the settlement are generally enclosed by the density of housing given the close grid iron pattern of housing development and mature vegetation pattern along the main street and square and towards the edge of the settlement. Occasional localised glimpses would be possible from upper storey properties and along open sightlines, through gaps in buildings and vegetation particularly from edge of settlement locations as demonstrated in Viewpoint 6, Figure 6.14f. Such views would face westwards looking across garden grounds, open fields and the forestry of Monahoudie Moss toward Roy's Hill amidst the rolling upland. The original Paul's Hill development is visible to the right hand side of Roy's Hill as a line of partially screened turbines emerging from behind the shoulder of land between the high points of Roy's Hill and Carn na Dubh-

Settlement: Archiestown

Chlais. The foreground forestry would likely largely screen views of Berryburn Wind Farm. The tips of the Rothes I and II turbines are theoretically visible but in reality the dense forestry planting to the north of the settlement screens views of these operational developments, and the Hill of Towie I turbines are theoretically visible and are potentially visible only from edge of settlement locations.

Predicted View (including cumulative baseline 1)

The ZTV in Figure 6.1 indicates full visibility of all the proposed Paul's Hill II turbines from all areas of the Archiestown settlement. However, as detailed above, where visible from the settlement, mainly from upper storey properties and through gaps in buildings and vegetation particularly from edge of settlement locations, the predicted theoretical operational view of the proposed Paul's Hill II Wind Farm development is depicted in Figure 6.8a and Figure 6.14f. The nacelles of 6 of the 7 Paul's Hill II turbines, turbine no's. 1- 6 are theoretically visible from the settlement. The proposed development therefore brings the Paul's Hill array over the lip of the intervening ridgeline, closer to the viewer. The intervening Monahoudie Moss forestry is not at a height to screen the upper parts of the Roy's Hill landform and the Paul's Hill I and Paul's Hill II array. All other operational developments are theoretically visible in successive views but forestry screens actual views of Rothes I and II blade tips and dense vegetation and buildings within the settlement screen all but edge of settlement locations from the Hill of Towie I development on the distant skyline.

Predicted Cumulative View

The scenario 2 consented Hill of Towie II and Dorenell developments and scenario 3 proposed Dorenell Extension and Variation would only be actually visible away from the screening elements of the internal structure of the settlement with occasional localised views only possible from edge of settlement locations and occasional higher storeys of properties with clear sightlines. Visibility with the Paul's Hill II turbines is highly unlikely as a clear 180 or 270 degree visibility arc would be required to see all developments together in a successive view. The density of the development and associate internal planting and intervening vegetation prevents this possibility, reducing any magnitude of cumulative visual change. It is predicted there will be no cumulative effects over and above those identified in the LVIA assessment.

Magnitude of Change

Geographical Extent: ***Small.*** Where visible, the proposed development would affect only a narrow portion of overall vista from the settlement.

Size and Scale: ***Negligible***. Throughout the settlement as a whole, only occasional and glimpsed views of the proposed development would be possible with the central core of the village and most of the village footprint not experiencing any visibility of the proposed development owing to the settlement density, internal vegetation structure and surrounding intervening screening forestry. Where visible, intervening features would still filter views toward the proposed development resulting in localised experiences of a minor level of size and scale element of visual change.

Duration and Reversibility: ***Long term*** theoretically ***reversible*** change

Overall Magnitude of visual change: ***Slight*** Magnitude of visual change causing a perceptible change in the view as a result of the additional of new features on the skyline which would only be visible from occasional gaps in vegetation and built structures and from upper storeys of properties. Changes would be long term but theoretically reversible.

Magnitude of Cumulative Change

Slight Magnitude of Cumulative Change in respect of the existing/consented developments (scenario 1). ***No additional change*** for scenario 2 and 3.

Visual Effect

Settlement: Archiestown

Moderate and ***Not Significant***. Considered not significant owing to the limited actual visibility throughout the settlement due to the dense settlement pattern, internal vegetation structure and intervening screening forestry, with a moderate level of effect predicted owing to the high sensitivity of the settlement receptor.

Cumulative Visual Effect

Moderate and ***Not Significant*** for scenario 1 developments***. No additional cumulative visual effect*** for scenario 2 and 3.

Upper Knockando

6.9.53 The settlement of Upper Knockando is located toward the edge of the Broad Farmed Valley LCT 7 at its' transition with the Upland Moorlands and Forestry LCT 10 on the lower slacker slopes of Carn na Cailliche. It is a well spread out settlement with arguably several centres including the area around Knockando School and western parts of Cardhu. The main western part of Upper Knockando which is assessed here is largely to the west of the village hall and set in the shallow wooded valley depression associated with a local tributary of Knockando Burn. The linear settlement has an unplanned, dispersed building pattern of mainly residential properties scattered along the B9102 and a few along the minor Upper Knockando to Dallas unclassified road heading north. Photographic Figure 6.6 is taken looking in the approximate direction of the proposed development less than 100m to the east from the position of the Settlement wireline SVP02 in Figure 6.8b, which indicates the theoretical view of the proposed development from within the village itself at the location of the junction of the B9102 and the unclassified Upper Knockando to Dallas road. At this Viewpoint wireline location, the line of single and one and half storey properties illustrated in the photographic figure has come to an end but the B9102 road still lies within the shallow valley depression and is surrounded by mixed woodland. Visualisation 7 in Figure 6.14g also indicates the potential view from a selected viewpoint on the northern edge of the Upper Knockando settlement, from the unclassified Dallas road as the route climbs out of the village. Assessment of this viewpoint is detailed in Table 6.38 and illustrates potential views from upper storey rear windows of properties within the settlement that line the B9102.

Photographic Figure 6.6:Illustrative Photograph looking westwards from along the B9102 from within Upper Knockando. (Image:Google)

Table 6.38: Assessment of potential effects on the settlement of Upper Knockando

Settlement: Upper Knockando
Description of Settlement
This settlement is located 4.3 km to the east-north-east of the proposed Paul's Hill II Wind Farm development.It is situated within the Broad Farmed Valley LCT (MN7) of Morayshire at the transition with the extensively forested LCT10 Upland Moorland and Forestry. Upper Knockando is a linear settlement mainly running along the B9102 and consists of a mix of single and one and half storey properties, some adjacent to the road and some set back along access drives and on embankments adjacent to the road. Some of these elevated properties to the north of the B9102 have vegetated rear gardens and the northern most property of the village, accessed off the eastern side of the unclassified Dallas road, to the south of Milton Farm has a large outbuilding which serves as screening for the elevated properties lying to the east. Properties are of a mixed modern style of render and tile/slate roof with some of vernacular stone and slate style construction.
Existing View (Including cumulative baseline 1)
Views from within the settlement are generally enclosed by the shallow valley landform and the intervening vegetation. Occasional localised glimpses are likely to be possible from upper storey rear and side windows of the northern, elevated properties along the B9102, although views from here would be filtered through garden vegetation and building structures and also from the northern most parts of the settlement as the Dallas road rises out of the valley depression allowing more elevated views across to the proposed Paul's Hill II Wind Farm development, as demonstrated in Viewpoint 7, Figure 6.14g. Such views would face westwards across grassed banks adjacent to the tributary of Knockando Burn, which runs through the settlement, taking in the skyline of Roy's Hill and the closer hill top of Hill of Slackmore of the rolling uplands. The original Paul's Hill development is visible in the westwards view, to the right hand side of Roy's Hill summit as a line of nacelles and a number of blade tips, partially screened and emerging from behind the closer hilltop of Hill of Slackmore. Intervening woodland blocks on the upper slopes of the Hill of Slackmore provide negligible screening and scattered farmsteads are visible with associated shelterbelts across the intervening hillside. No other wind farm developments are visible from any parts of the settlement.
Predicted View (including cumulative baseline 1)
The ZTV in Figure 6.1 indicates visibility of between 5 and 7 of the proposed Paul's Hill II turbines from the parts of the Upper Knockando settlement to the north of the B9102. Where visible from the settlement, mainly from the northern-most part of the settlement from along the Dallas road, the predicted theoretical operational view of the proposed Paul's Hill II Wind Farm development is depicted in Figure 6.8b and Figure 6.14g and shows the nacelles of 5 of the 7 Paul's Hill II turbines, turbine no's. 1- 4, 5 and 6 are theoretically visible, together with the edge of blade tips of the remaining 2 turbines which would be visible behind Roy's Hill and Hill of Slackmore skyline. The proposed development remains behind the skylining ridge but appear as larger turbines closer to the viewer. The proposed turbines appear in front of and overlap with the existing Paul's Hill turbines but are more noticeable than the existing turbines which would be just perceptible looking 'through' the proposed turbines and continuing to the right hand side of proposed turbine no. 3. No other wind farm development is visible from this viewpoint meaning the proposed turbines represent a new addition to the view.
Predicted Cumulative View
There would be no additional change to the scenario 2 and 3 views as no other wind farm development would be visible.

Settlement: Upper Knockando
Magnitude of Change
Geographical Extent: ***Small.*** Where visible, the proposed development would affect only a narrow portion of overall vista from the settlement. *Size and Scale:* ***Minor***. Throughout the settlement as a whole, only localised views of the proposed development from the northern most part of the settlement would be possible with the central core of the village and most of the village footprint not experiencing any visibility of the proposed development owing to the subtle, containing valley, settlement density and surrounding intervening screening vegetation. Where visible, intervening features would still filter views toward the proposed development resulting in localised experiences of a moderate level of size and scale element of visual change. *Duration and Reversibility:* ***Long term*** theoretically ***reversible*** change *Overall Magnitude of visual change:* ***Slight*** Magnitude of overall visual change causing a perceptible change in the view as a result of the additional of new features on the skyline which would only be visible from the northern most parts of the settlement and from occasional upper storeys of properties. Changes would be long term but theoretically reversible.
Magnitude of Cumulative Change
Slight Magnitude of Cumulative Change in respect of the existing/consented developments (scenario 1). ***No additional change*** for scenario 2 and 3.
Visual Effect
Moderate and ***Not Significant***. Considered not significant owing to the limited actual visibility throughout the settlement due to the subtle, containing valley, settlement density and surrounding intervening screening vegetation, with a moderate level of effect predicted owing to the high sensitivity of the settlement receptor.
Cumulative Visual Effect
Moderate and ***Not Significant*** for scenario 1 developments***. No additional cumulative visual effect*** for scenario 2 and 3.

Craigellachie

6.9.54 The settlement of Craigellachie is located within the Broad Farmed Valley LCT 7 on the lower slacker slopes of Ben Aigan. It is well contained by surrounding forested hills and is centred on the original A95 road route and the old Speyside railway route. Refer to Table 6.39 for the complete assessment. The settlement itself is densely developed with mainly vernacular properties adjacent to the old A95 road route and around the school building higher up the hill, and are of stone/render and slate construction, ranging from one and half to two storey properties with the Craigellachie Hotel commanding an elevated position and standing at 3 storeys. Modern two storey terraced properties are generally found toward the periphery of the settlement and on the elevated parts of the village such as around John street. The Photographic Figure 6.7 below is taken from the A95 approach road into the village approximately 60m downhill from the Craigellachie hotel entrance. The image is taken looking toward the settlement and not toward the proposed Paul's Hill II development area of which there is no visibility from these lower parts of the settlement as shown in the ZTV (Figure 6.1).

6.9.55 The settlement wireline SVP03 in Figure 6.8c indicates the theoretical view of the proposed development from the elevated parts of the village near to Craigellachie School and the two storey housing estate around John Street. Photographic Figure 6.8 Photographic Figure 6.8is taken looking in the approximate direction of the proposed development from Craigellachie School, near to the location of the wireline SVP03, to illustrate the dense development of this area

Photographic Figure 6.7: Illustrative Photograph south-eastwards from along the A95 from within Craigellachie.

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Photographic Figure 6.8: Illustrative Photograph looking south-westwards from Craigellachie School (Image:Google)

Table 6.39: Assessment of potential effects on the settlement of Craigellachie

Settlement: Craigellachie
Description of Settlement
This settlement is located 15.2 km to the north-east of the proposed Paul's Hill II Wind Farm development. It is situated within the Broad Farmed Valley LCT (MN7) of Morayshire. Craigellachie is a vernacular settlement following the original route of the A95 and is a mix of largely stone/render and slate properties, ranging from one and half to two storey properties with the Craigellachie Hotel standing at 3 storeys.
Existing View (Including cumulative baseline 1)
Views from within the settlement are generally enclosed by the steep valley sides of the low hills which shape the Spey Valley. Figure 6.8c indicates no operational wind farm developments are visible from this part of the settlement and the cumulative ZTV shown in Figure 6.13a indicates limited visibility, only from peripheral settlement areas of the operational Paul's Hill and Berryburn developments. In these rare glimpses of operational turbines, the rolling upland hills containing the Paul's Hill I and Berryburn Wind Farm developments would appear as low distant skylining hills over 15 km from the settlement and would be barely perceptible. The experience of the vernacular settlement style, the A95 road route and the shadow of Ben Aigan all currently dominate the visual experience from the Craigellachie settlement.
Predicted View (including cumulative baseline 1)
The ZTV in Figure 6.1 and cumulative ZTV in Figure 6.13a indicates visibility of up to 5 of the proposed Paul's Hill II turbines from peripheral parts of the Craigellachie settlement and up to 4 of the proposed turbines from the elevated streets around Craigellachie School as represented by settlement wireline SVP03 Figure 6.8c. In reality views from here are of 1 nacelle and 3 further edge of blade tips which would be further restricted by intervening forested hills and built development with any possible views throughout the village likely to be restricted to the upper storey south-west facing windows, such as from Craigellachie Hotel which commands an elevated position. The distance and intervening vegetation would mean the proposed development would be barely perceptible on the distant skyline. The experience of the vernacular settlement style, the A95 road route and Ben Aigan would remain dominant features unaffected by the proposed development. Figure 6.1 and site verification indicates no visibility of the proposed development from the main A95 approach road into Craigellachie village.
Predicted Cumulative View
There is very little visibility of other consented and proposed wind farm developments from within Craigellachie. As demonstrated by Figure 6.8c, parts of 3 of the consented Hill of Towie II turbines would be theoretically visible above intervening forested hills and between building structures. Cumulative ZTVS, Figures 6.13j and 6.13k show a similar picture of minimal additional visibility of other scenario 2 and 3 developments.
Magnitude of Change
Geographical Extent: ***Negligible.*** Where visible, the proposed development would affect only a very narrow portion of overall vista from the settlement.
Size and Scale: ***Negligible***. Throughout the settlement as a whole, it is likely only localised views of the proposed development from the upper storeys of the tallest properties with south-western facing windows would be possible with the central core of the village and most of the village footprint not experiencing any visibility of the proposed development owing to the containing valley landform. Where visible, distance would substantially reduce the level of any visual change.

Settlement: Craigellachie
Duration and Reversibility: ***Long term*** theoretically ***reversible*** change
Overall Magnitude of visual change: ***Negligible*** Magnitude of overall visual change causing a barely perceptible change in the view as a result of the additional of new features on the skyline which would only be visible from a restricted number of locations throughout the village with further mitigation owing to distance. Changes would be long term but theoretically reversible.
Magnitude of Cumulative Change
Negligible Magnitude of Cumulative Change in respect of the existing/consented developments (scenario 1). ***No additional change to Negligible*** for scenarios 2 and 3.
Visual Effect
Minor/Moderate and ***Not Significant***. Considered not significant owing to the limited actual visibility throughout the settlement due to the containing valley.
Cumulative Visual Effect
Minor/Moderate and ***Not Significant*** for scenario 1 developments***. No additional cumulative visual effect*** for scenario 2 and 3.

Dallas

6.9.56 The settlement of Dallas (refer to Table 6.40) is located within the Rolling Farmland and Forests with Valleys LCT 5a on the broad floodplain of the Lossie Valley and at the transition with the Upland Moorland and Forestry LCT10. It is surrounded by extensive forestry to the north, on the containing rolling farmland ridgelines and to the west. The settlement itself is a linear compact settlement along the unclassified road between Upper Knockando and the B9010, to the east of Dallas. It comprises a mix of single storey and one and half storey modern style stone/render and tile construction on the edges of the settlement and a core of vernacular properties of single and one and half storey stone/render and slate construction. The settlement wireline SVP04 in Figure 6.8d indicates the theoretical view of the proposed development from the northern end of the village, near the junction with the minor Dallas to Upper Knockando road. The photographic image in Photographic Figure 6.9 is taken approximately 200m to the east along the main street looking toward the proposed Paul's Hill II development area and illustrates the dense development of the village which largely restricts outward views.

Photographic Figure 6.9: Illustrative Photograph looking southwards from Main Street within Dallas

Table 6.40: Assessment of potential effects on the settlement of Dallas

Settlement: Dallas
Description of Settlement
This settlement is located 10.8 km to the north-east of the proposed Paul's Hill II Wind Farm development, at an elevation of 149 m AOD. It is situated within the Rolling Farmland and Forests with Valleys LCT 5a of Morayshire. The settlement itself is a linear compact settlement along the unclassified road between Upper Knockando and the B9010, to the east of Dallas. It comprises a mix of single storey and one and half storey modern style stone/render and tile construction on the edges of the settlement and a core of vernacular properties of single and one and half storey stone/render and slate construction.
Existing View (Including cumulative baseline 1)
Views from within the settlement are generally enclosed by the forested moorland hills which shape the Lossie Valley. Figure 6.8d indicates theoretical visibility of the original Paul's Hill, Berryburn and the tips of Rothes I and II operational wind farm developments. In reality, dense riparian vegetation associated with the River Lossie further contains views from the village and operational turbines are barely perceptible from within the village.
Predicted View (including cumulative baseline 1)
The ZTV in Figure 6.1 and settlement wireline SVP04 Dallas, shown in Figure 6.8d indicates theoretical visibility of all 7 of the proposed Paul's Hill II turbines from the western area of the Dallas settlement including the Primary School, road junction with the Upper Knockando road and the War Memorial. In reality, this view is obscured by intervening amenity trees to the north of the Primary School and extensive intervening forestry south of the settlement, particularly around Glen Lossie. Any possible views throughout the rest of the village are likely to be restricted to the upper storey southern facing windows with less intervening vegetation to screen the possible view. Any turbines visible would appear as nacelles and blade tips on the distant skylining

Settlement: Dallas
hills over 10 km away from the settlement and would be a barely perceptible feature on the distant skyline. Dallas would remain a largely inward looking settlement owing to its valley position.
Predicted Cumulative View
As shown in Figure 6.8d, and cumulative ZTV 6.13f the scenario 2 consented developments of Kellas and Meikle Hill would be theoretically visible from parts of Dallas and would appear as blade tips and nacelles and blade tips respectively and where visible would appear as more noticeable, closer features to the viewer, where clear visibility is possible above intervening forestry and building structures. No scenario 3 developments would be visible from the settlement as shown in the cumulative ZTVs Figures 6.13c, 6.13e and 6.13g.
Magnitude of Change
Geographical Extent: ***Small.*** Where visible, the proposed development would affect only a narrow portion of overall vista from the settlement. *Size and Scale:* ***Negligible***. Throughout the settlement as a whole, it is likely only localised views of the proposed development from the upper storeys of the tallest properties with southern facing windows would be possible with the central core of the village and most of the village footprint not experiencing any visibility of the proposed development owing to the containing valley landform and intervening vegetation and village density of built structures. *Duration and Reversibility:* ***Long term*** theoretically ***reversible*** change *Overall Magnitude of visual change:* ***Slight*** Magnitude of overall visual change causing, where visible a perceptible change in the view as a result of the additional of new features on the skyline which would only be visible from a very restricted number of locations throughout the village and not from publicly accessible ground level locations. Changes would be long term but theoretically reversible.
Magnitude of Cumulative Change
Slight Magnitude of Cumulative Change in respect of the existing/consented developments (scenario 1). Remains as ***Slight*** for scenario 2 and 3 owing to the limited difference in visual change with the addition of the proposed development into cumulative scenarios 2 and 3.
Visual Effect
Minor/Moderate and ***Not Significant***. Considered not significant owing to the limited actual visibility throughout the settlement due to the containing valley.
Cumulative Visual Effect
Minor/Moderate and ***Not Significant*** for scenario 1 developments***. No change*** in visual effect for scenarios 2 and 3.

Summary of Effects from Settlements

6.9.57 No significant visual effects have been identified from any of the four assessed settlements. Some moderate levels of visual change have been identified from Upper Knockando and Archiestown within 10 km of the proposed Paul's Hill II Wind Farm development mainly due to the high sensitivity of the settlement receptors rather than any high level of visual change predicted. These effects are not considered significant owing to the limited actual visibility throughout the settlements resulting from the containing valley sides, settlement density, internal vegetation structure and/or surrounding intervening screening vegetation.

Effect on Sequential Routes

6.9.58 The 8 routes included in the final VIA are shown in Figure 6.9 with full ZTV mapping illustrated in Figure 6.1 and detailed ZTV mapping for the central parts of each sequential route falling within the study area being illustrated in Figures 6.10a-f. Cumulative ZTV mapping in Figures 6.13a-k are also referred to for the CLVIA included below. It should be noted that the SW04 Moray Core Path route is included within the Speyside Way route as these routes follow the same path. In addition SP19 and SP20 Moray Core Paths are combined into one assessment as these paths follow successively from each other. A total of 6 route assessments are therefore included in this VIA.

6.9.59 The following two tables have been prepared summarising the statistics illustrated in the detailed sequential ZTVs in Figures 6.10a-f. The lengths of the sequential routes considered within the study area, the proportion of the routes that experience differing degrees of openness and enclosure and the proportion of the route experiencing visibility of the proposed Paul's Hill II Wind Farm development are included in Table 6.41 and Table 6.42.

Table 6.41: Lengths of Openness/Enclosure along Sequential Routes

Route	Total length (m)	Fully Open	Mostly Open	Intermittent Openness	Mostly Enclosed	Fully Enclosed
A95	74794	28487	9259	12037	13052	11959
B9102	20564	5802	4589	3586	1758	4829
B970	28276	2708	5922	5070	4515	10061
C13E Dallas to Knockando minor road	11755	2211	3442	1497	1471	3134
Moray CP SP 19 & 20	2661	229	560	185	57	1630
Speyside Way	116296	13978	19837	28728	14219	39534

Table 6.42: Lengths of Openness/Enclosure where the proposed development is visible along Sequential Routes

Route	Total length (m)	Total length of visibility	Fully Open	Mostly Open	Intermittent Openness	Mostly Enclosed	Fully Enclosed
A95	74794	26191	10151	1285	2537	6762	5456
B9102	20564	11272	2847	4069	1187	1019	2150
B970	28276	13988	1076	2840	2979	3227	3866
Dallas to Knockando minor road	11755	10235	2161	3033	1497	1216	2328
Moray CP SP 19 & 20	2661	2008	229	560	130	57	1032
Speyside Way	116296	36441	5637	5704	5209	6121	13770

6.9.60 Detailed assessment of potential effects on the 6 sequential routes are included in Table 6.43, Table 6.44, Table 6.45, Table 6.46, Table 6.47 and Table 6.48.

A95

6.9.61 This main road route runs for 74.79 km within the study area, between Keith, Grantown-on-Spey and the A9 road route in the west of the study area. This is a heavily used route, featuring in tourist literature. Cartographic desktop

study and site verification has identified that for 33% of its length, it is largely visually contained by the enclosing hills of the Spey Valley, roadside vegetation and building structures.

6.9.62 The route lies 5.8 km from the proposed development at its closest point at Tormore Distillery and largely follows the Spey River for its length, running through numerous landscape character areas. The route begins in Keith and passes through the Upland Farmland LCT8 which surrounds this urban centre. The route then passes through the Rolling Forested Hills LCT9 until it enters the recognisable Broad Farmed Valley LCT7 and joins the route of the River Spey. West of Advie, the road route enters the CNP and passes through the Lower Strathspey and Strathspey Glen Landscape Character Areas, until the route joins the A9 at Aviemore. The entire of the A95 road route lies within the study area.

6.9.63 Representative visualisations from this sequential route include Viewpoint 1, Tormore Distillery (Figure 6.14a), Viewpoint 9, A95 between Aberlour and Ballindalloch (Figure 6.14j), Viewpoint 10 A95 Memorial at Junction with the B9008 (Figure 6.14k) and Sequential Route Viewpoint SEQ01 A95 at Cromdale, (Figure 6.15a). The Viewpoint locations are shown on the Sequential Route visibility ZTV maps for the A95, (Figure 6.10ai and Figure 6.10aii.)

Table 6.43: Assessment of potential effects on the A95 Sequential Road Route

Sequential Road Route: A95
Sensitivity
Value of the view: ***High***. Popular visitor route that is well promoted by tourist literature. Passes through the Local landscape designation of the Spey Valley AGLV and the National landscape designation of the CNP. *Susceptibility:* ***Medium***. This is a main trunk road and a fast road route where the attention of the viewer is not always on the surrounding landscape. *Overall Sensitivity:* ***Medium*** sensitivity of this route. Although this is a popular road route, the view is not integral to the overall experience of the route and this is a fast road route where the main purpose is travel between Spey Valley attractions and settlements.
Existing sequential visibility (Including cumulative baseline 1)
The general existing views from this route consist of passing settlements, changing levels of tree cover including roadside vegetation, policy woods and forestry plantations and occasional stretches of open views to the often forested/wooded valley side slopes and views along the valley. With reference to the cumulative ZTV of scenario 1, operational and under construction wind farm developments, there is some theoretical visibility of operational developments for the length of the route between Keith and Grantown-on-Spey. As shown in Figures 6.13a, b and c, these include Paul's Hill I, Berryburn and Hill of Towie I, particularly towards the Keith end of the route with some short stretches of visibility of the Rothes I and Rothes II developments.
Predicted sequential visibility (including cumulative baseline 1)
The interlocking spurs of the containing hills often visually contain the route of the A95 toward the proposed Paul's Hill II Wind Farm development resulting in only 35% of the route experiencing any visibility of the proposed development. The detailed ZTV in Figure 6.10ai and Figure 6.10aii indicates only 5 short sections of less than 1 km each where visibility of all 7 proposed Paul's Hill II turbines would be possible. Each of these occurrences are from areas with some form of enclosure, generally created by route side vegetation, building structures or close proximity woodland cover. Overall, only approximately 13% of the total route experiences some theoretical visibility and is considered to be fully open. However, intervening vegetation and infrastructure that is not necessarily close to the roadside so as not to enclose it, still affects overall visibility of the proposed development, particularly if this is a distant or barely perceptible view of minimal blade tips. Visibility of the proposed development, travelling north-eastwards from Aviemore does not begin until Broomhill where a short 1 km stretch of partial visibility of only 1 turbine, from a mostly open area is possible. In reality roadside clutter, intervening forestry blocks and distance would mean this turbine would be barely perceptible on the distant skyline. Broken stretches of theoretical visibility then occur east of Grantown after the By-pass and the visualisation SEQ01 Figure 6.15a indicates 3 theoretically visible turbine tips from the traffic lights at Cromdale and over the old railway bridge. In reality the roadside clutter and distance of 13.3 km means this is a barely perceptible change to the distant skyline. Broken stretches of partial visibility of between 1-3 turbines then begins at Mains of Dalvey and continues until the A95 route approaches the Moray Council boundary at the sample visualisation VP1 at Tormore Distillery. This is a relatively close VP to the proposed development at 5.9 km and shows up to 5 proposed turbine nacelles/tips as shown in Figure 6.14a and assessed in Table 6.24. Almost continuous theoretical visibility then continues around the Cragganmore access road and Ballindalloch, through to east of Marypark, but in reality, glimpsed views are only possible such as demonstrated by sample VP10 in Figure 6.14k where the A95 is not enclosed by localised roadside engineered landform, the dense policy woods associated with Ballindalloch Castle, roadside tree cover or building structures. A gap in visibility then occurs in the low lying depression of the Daugh of Carron, until visibility then begins again just west of the access road to the settlement of Carron. Sample VP9 in Figure 6.14j is assessed in Table 6.32 indicating a noticeable visual change from this location looking south-westwards but not a significant visual effect owing to the limited angle of view affected, and the retention of the key view across the pastoral valley landscape toward the distinctive peaks of Ben Rinnes and Little and Meikle Conval. The landform containment of the settlement of Aberlour prevents visibility of the proposed development any further until a short theoretical stretch of visibility east of Craigellachie, but in reality this would be reduced to glimpsed views above intervening forestry. With the exception of a 300m stretch of partial distant theoretical visibility of up to 2 turbine nacelles, there is no further visibility up to the end of the route at Keith.
Predicted Cumulative sequential visibility
As shown in Figure 6.13h, Paul's Hill II turbines are mostly visible in conjunction with scenario 1 developments, with the exception of the stretches at Broomhill and Cromdale which demonstrate barely perceptible visibility of the proposed development. As shown in cumulative ZTVs Figures 6.13f & d scenario 2 developments theoretically visible from the A95 route include the scenario 1 developments and Dorenell and Hill of Towie II at the Keith end of the route and Meikle Hill and Kellas for short stretches between Ballindalloch and Craigellachie. There is no visibility of the Cairn Duhie development from the A95. There is also no combined visibility of the proposed development with any additional scenario 2 developments. As shown in cumulative ZTV Figure 6.13e, scenario 3 developments with combined theoretical visibility from the A95 ro**ute include the scenario 1 developments and a very short stretch where the proposed Dorenell Variation and** Extension would be theoretically visible in combination with the proposed Paul's Hill II development, passed Craigellachie.
Magnitude of visual Change
Geographical Extent: ***Small.*** As demonstrated, in reality only glimpsed views from the overall A95 length would be possible with only 18% of the total route length experiencing any theoretical visibility and having some degree of openness. Where visible, the proposed development would affect only a narrow portion of overall vista from the route. *Size and Scale:* ***Minor***. Throughout the route as a whole, only localised views of the proposed development would be possible with most possible views being of part of the development such as blade tips or distant views. There is very little overall actual visibility of all of the proposed development owing to the containing valley landform and intervening vegetation and density of built structures along the route. *Duration and Reversibility:* ***Long term*** theoretically ***reversible*** change *Overall Magnitude of visual change:* ***Slight*** Magnitude of overall visual change causing, where visible a perceptible change in the view as a result of the additional of new features on the skyline which would only be

Sequential Road Route: A95
visible from a restricted number of locations throughout the route. Changes would be long term but theoretically reversible.
Magnitude of Cumulative Visual Change
Slight Magnitude of Cumulative Change in respect of the existing/consented developments (scenario 1). No perceptible combined visual change for scenario 2 and 3 developments. Magnitude of Cumulative Change remains Slight.
Visual Effect
Moderate and ***Not Significant***. Considered not significant owing to the limited actual visibility throughout the route due to the containing valley and the visibility of the proposed development where it is visible in the context of operational developments mainly Paul's Hill, Berryburn, Rothes I and Rothes II.
Cumulative Visual Effect
Moderate and ***Not Significant*** for scenario 1 developments***.*** Remains Moderate and Not significant effect for scenarios 2 and 3.

B9102

6.9.64 This secondary road route runs for 37.5 km within the study area from the outskirts of Craigellachie, through Archiestown, passing Cragganmore on the other side of the old railway bridge across the Spey River, and extends to Grantown-on-Spey. This is a well-used local connecting and access road. Cartographic desktop study and site verification has identified that for 33% of its length, it is largely visually contained by localised landform and valley depressions, roadside vegetation and forestry plantations and building structures.

6.9.65 The route lies 3.4 km from the proposed development at its closest point south of Upper Knockando and largely follows the upper slopes along the northern edge of the Broad Farmed Spey Valley LCT7 near to the transition with the Upland Moorland and Forestry LCT10 and the Open Rolling Upland LCT11. Beyond Cragganmore heading west, the B9102 passes through the Lower Spey Cairngorm Strath (CNG3-14) and the Strathspey and Craggan to Grantown Strath. The entire of the B9102 road route lies within the study area.

6.9.66 Representative visualisations from this sequential route include Viewpoint 6, Archiestown (Figure 6.14f), which lies just to the south of this road route, Viewpoint 7, Upper Knockando (Figure 6.14g), which lies just to the north of the B9102 and Cultural Heritage CH05 Knockando Kirkyard, (Figure 9.6), also just to the north of the B9102. The Viewpoint locations are shown on the Sequential Route visibility ZTV maps for the B9102, (Figure 6.10b). Photographic Photographic Figure 6.10 below shows an illustrative example of how the B9102 roadside is mostly open in the vicinity of Woodside cottage to the east of the Cardhu access road. The operational Paul's Hill I Wind Farm development is currently partially visible above the rolling hills on the skyline approximately 7 km in the middle distance.

Photographic Figure 6.10: Illustrative Photograph looking west-south-westwards from east of Cardhu access road from along the B9102

Table 6.44 Assessment of potential effects on the B9102 Sequential Road Route

Sequential Road Route: B9102
Sensitivity
Value of the view: ***Medium***. Well used local connection route. The last 5 km of the route from south of Upper Knockando to Cragganmore lies within the local landscape designation of the Spey Valley AGLV which elevates value of views from low to medium. *Susceptibility:* ***Low***. This is a local access road where the purpose of the viewer is generally to travel and where the view is not important to the journey. *Overall Sensitivity:* ***Low*** sensitivity of this route.
Existing sequential visibility (Including cumulative baseline 1)
The general existing views from this route consist of isolated properties and small settlements, such as the planned and orderly pattern of Archiestown and the disaggregated centre of Upper Knockando, extensive forestry plantations with changing levels of tree cover owing to felling operations and occasional stretches of open views across the fringes of the upland moorland and rolling hills. With reference to the cumulative ZTV of scenario 1, operational and under construction wind farm developments, Figure 6.13h, there is some theoretical visibility of operational developments for the length of the route between the A95 at Craigellachie and the Scoot More forestry plantation, south of Upper Knockando, heading west. As shown in Figures 6.13a, b and c, these include Paul's Hill I, Berryburn and visibility of Hill of Towie I at the eastern end with some short stretches of visibility of the Rothes I and Rothes II developments to the east and west of Archiestown.
Predicted sequential visibility (including cumulative baseline 1)

Sequential Road Route: B9102

The B9102 route follows the elevated upper slopes of the Spey Valley allowing relatively uninterrupted theoretical views across the fringe moorland with 30% of the route length experiencing theoretical visibility of the proposed development, largely between Robertstown and Scoot More forestry Plantation. The detailed ZTV in Figure 6.10b indicates the first view of the proposed development, heading west along the B9102 from Craigellachie can be seen as the road emerges from the wooded and enclosed beginning section rising up from the A95/A941. This involves a stretch of less than 1 km of reducing theoretical visibility from 7 proposed turbines to 1. The following lower lying section of the route then shows no visibility until east of Robertstown where there is a relatively unbroken line for approximately 6.2 km of continual full theoretical visibility of all 7 proposed turbines between Robertstown (east of Archiestown) and the Moray Core Path S20 access path to Knockando village. In reality, isolated properties along this route and associated shelterbelts and garden vegetation, together with the building structures of Archiestown and the extensive tracts of intervening forestry lining the road route all reduce the actual visibility from this 6.2 km stretch. From along this stretch only 0.5 km of the length shows no form of enclosure, allowing potentially open views across the forested moorland towards the proposed development. Where the Core Path S20 access path joins the B9102, forms an approximate limit to this 6.2km theoretical visibility stretch and is represented by CH05 Figure 9.6, taken from Knockando kirkyard higher up the slope. The equivalent position along the B9102 is visually sunk in the mini Valley of Knockando Burn and well wooded with no actual visibility toward the proposed development. West of here, along the B9102, the visibility is more patchy owing to the valley depression in which the route lies, riparian vegetation and the building structures associated with Upper Knockando village which stretches along the B9102. VP7 in figure 6.14g lies at a higher elevation from the B9102 along the junction with the C13E minor road and as such actual visibility from the B9102 is extremely restricted at this point. Travelling westwards, the route rises to achieve some clearer views across to the rolling uplands with a short stretch of glimpsed views similar to that represented in VP7. The route then proceeds to drop in elevation heading southwards with reducing visibility over a 2 km stretch after which no visibility is shown for a further 20.6 km up to the end of the route, with the exception of glimpsed theoretical isolated spots of visibility of up to 2 turbines from forested sections of the route which have no actual visibility of the proposed development. Overall, only approximately 7% of the total route experiences some theoretical visibility and is considered to be fully open. However, intervening forestry and infrastructure that is not necessarily close to the roadside so as not to enclose it, still affects overall visibility of the proposed development, particularly if this is a distant or barely perceptible view of minimal blade tips.

Predicted Cumulative sequential visibility

As shown in Figure 6.13h, Paul's Hill II turbines are entirely visible in conjunction with scenario 1 developments, with one isolated very small patch of theoretical visibility south-west of the Scoot More Plantation which has no actual visibility of the proposed development owing to enclosing forestry. As shown in Figure 6.13a, b and c, these operational developments largely consist of visibility of Hill of Towie I at the eastern end of the B9102 and patches of visibility of Rothes I and II, Paul's Hill I and Berryburn in the central part of the route around Archiestown. Paul's Hill I Wind Farm would then be visible in conjunction with Paul's Hill II around Upper Knockando and Rothes II visible south-west of Upper Knockando heading to Scoot More Plantation, beyond which patches of visibility of operational developments occur until the route end at Grantown without combined visibility with the proposed Paul's Hill II turbines. As shown in cumulative ZTVs Figures 6.13c, f and e scenario 2 developments theoretically visible in conjunction with Paul's Hill II from the A9102 route include the scenario 1 developments and the Consented Dorenell and Hill of Towie II at the eastern end of the route. Dorenell would be partially visible to the east of and 'behind' Ben Rinnes which is a distinctive skyline feature on the distant horizon. Meikle Hill would be visible in combination with Paul's Hill II for a stretch south-west of Upper Knockando but Meikle Hill would appear as only blade tips in the lower lying parts of this road. Clashindarroch, Hill of Glaschyle,Kellas and Cairn Duhie developments are all not visible from the B9102 route. As shown in cumulative ZTV Figure 6.13e, The proposed Dorenell Extension and

Sequential Road Route: B9102

Variation developments are the only scenario 3 developments with combined theoretical visibility with the Paul's Hill II development from the A9102 route around Archiestown, All scenario 2 and 3 developments are well separated geographically from the proposed Paul's Hill II development with any combined visibility generally being successive visibility in different angles of view.

Magnitude of visual Change

Geographical Extent: ***Small.*** Theoretical visibility extends for 30% of the overall route with actual visibility from areas with some degree of openness occurring from 21% of the route. In reality glimpsed views would be possible, some at a relatively close proximity owing to the distance of the route from the proposed development. Where visible, the proposed development would affect a small to medium portion of overall vista from the route.

Size and Scale: ***Moderate***. Throughout the route as a whole, only localised views of the proposed development would be possible with most possible views being of most of the proposed turbines above hub height level creating a moderate level of visual change.

Duration and Reversibility: ***Long term*** theoretically ***reversible*** change

Overall Magnitude of visual change: ***Moderate*** Magnitude of overall visual change causing, where visible a noticeable change in the view as a result of the additional of new features on the skyline which would only be visible from a restricted number of locations throughout the route. Changes would be long term but theoretically reversible.

Magnitude of Cumulative Visual Change

Moderate Magnitude of Cumulative Change in respect of the existing/consented developments (scenario 1). No perceptible combined additional visual change for scenario 2 and 3 developments owing to the geographical separation of these developments from Paul's Hill II. No additional cumulative visual change over and above that predicted in the LVIA. Magnitude of Cumulative Change remains Moderate.

Visual Effect

Minor/Moderate and ***Not Significant***. Considered not significant owing to the limited actual visibility throughout the route due to the extensive forestry, natural containment of lower lying stretches of the route, built developments along the B9102 and where it is visible, the visibility of the proposed development in the context of operational developments principally Paul's Hill and Rothes II.

Cumulative Visual Effect

Minor/Moderate and ***Not Significant*** for scenario 1 developments***.*** Remains Minor/Moderate and Not significant effect for scenarios 2 and 3.

B970

6.9.67 This secondary road route runs for 28.28 km from the outskirts of Grantown-on-Spey, through Nethy Bridge and Coylumbridge on the outskirts of Aviemore and extends to Kingussie, beyond the study area. This is a well-used local connecting and access road and popular tourist route and also follows the National Cycle Route 7. Cartographic desktop study and site verification has identified that for 51% of its length, it is largely visually contained by the enclosing hills of the Spey Valley, roadside vegetation and extensive forestry plantations and building structures.

6.9.68 The route lies 17.1 km from the proposed development at its closest point outside Grantown-on-Spey and follows the Strathspey Straths Landscape Character Areas, Craggan to Grantown, Boat of Garten to Craggan, Pityoulish to Boat of Garten and Inverdruie to Pityoulish and the Badenoch Strath LCA: Loch Alvie to Inverdruie. The B970

route leads to Aviemore but continues beyond the study area. Detailed assessment has only been carried out for the 28.28 km section of the B9102 that lies within the study area.

6.9.69 Representative visualisations from this sequential route include SEQVP02 B970, Tomachrochar (Figure 6.15b), and SEQVP03 B970, North of Nethy Bridge. (Figure 6.15c). The Viewpoint locations are shown on the Sequential Route visibility ZTV maps for the B970, (Figure 6.10f). Photographic Figure 6.11 below shows an illustrative example of how the roadside is mostly open in the vicinity of Tomdhu, approximately 0.9km to the south of the SEQVP02 at Tomachrochar. On a clear day the faint distant skyline is just visible at this distance of 25 km from the uplands containing the proposed development.

Photographic Figure 6.11: Illustrative Photograph looking northwards from close to Tomdhu along the B970

Table 6.45: Assessment of potential effects on the B970 Sequential Road Route

Sequential Road Route: B970
Sensitivity
Value of the view: ***High***. Popular visitor route that is well promoted by tourist literature. Passes through the National landscape designation of the CNP.
Susceptibility: ***High***. This is an advertised scenic route passing through the attractive Strathspey landscapes where the attention of the viewer is generally on the surrounding landscape.
Overall Sensitivity: ***High*** sensitivity of this route.
Existing sequential visibility (Including cumulative baseline 1)
The general existing views from this route consist of passing settlements and isolated farmsteads and properties, changing levels of tree cover including roadside vegetation, woodlands and forestry plantations
Sequential Road Route: B970
and occasional long open vistas towards surrounding upland landscapes. With reference to the cumulative ZTV of scenario 1, operational and under construction wind farm developments (Figure 6.13h) and Figures 6.13a-c, there is some theoretical visibility of the operational development of Paul's Hill I only, from 3 separate sections along the route, north of Boat of Garten. This would appear as blade tips on the distant northern skyline.
Predicted sequential visibility (including cumulative baseline 1)
The interlocking spurs of the containing hills on either side of the Spey Valley partly visually contain the route of the B970 toward the proposed Paul's Hill II Wind Farm development resulting in 49% of the route experiencing any theoretical visibility of the proposed development with a proportion of these areas of theoretical visibility experiencing some form of visual enclosure, leading to only 24% of the total route experiencing any theoretical visibility within an area of some degree of openness. Some stretches of the road, such as the relatively low lying stretch near Mains of Garten between Boat of Garten and Nethy Bridge, allow long vistas toward the surrounding higher upland landscapes, including the rolling uplands containing the proposed development. The detailed ZTV in Figure 6.10f indicate the theoretical visibility of up to 5 of the proposed turbines with no areas of visibility of all 7 of the proposed turbines. This indicates the potential visibility of only blade tips from this route as illustrated in SEQVPs 2 and 3 (Figures 6.15b and c). Visibility of the proposed development, travelling north-eastwards from along the B970 spur leading to Kingussie, south of Aviemore begins with intermittent theoretical visibility of up to 2-3 turbine tips. In reality, this spur experiences roadside enclosure from forestry plantations and roadside vegetation, and combined with the distance of over 35 km from the proposed development leads to no actual visibility from this southern stretch of the route. Following a gap in visibility owing to intervening landform, north of Inverdruie, patches of visibility of up to 3 turbine tips continues with some breaks in visibility for up to 3.5 km to south of Auchgourish and then between Glencairn and Street of Kincardine for a further 1.9 km with most of this stretch experiencing some form of visual enclosure from roadside vegetation to forestry plantations and building structures. Following a 3.7 km break in visibility, theoretical visibility then begins again at around Tomdhu as represented by SEQVP2 (Figure 6.15b) where 3 very edge of tips are seen on the distant skyline at a distance of 24.6km from the proposed development. Roadside clutter and vegetation further filter this view leading to the proposed development appearing barely perceptible in reality from this location. Intervening landform prevents any visibility from the settlement of Nethy Bridge and visibility begins again north of the settlement as represented by SEQVP03 (Figure 6.15c) which shows a hub and 3 further blade tips of the proposed development visible above the distant skyline 21.3 km away. In reality, intervening woodland south of Grantown, roadside clutter and distance further reduces the perceptibility of the proposed development at this location. North of this point, the dense enclosure of Craigmore Wood prevents visibility northwards. A further gap in visibility is followed by theoretical visibility of mostly up to 2 turbine tips for the last 1 km stretch of the route until it joins the A95 east of Grantown. Intervening vegetation in the direction of view toward the proposed development further reduces any actual view from this stretch of the route with the potential of glimpses of barely perceptible turbine tips from a minimum distance of 17 km.
Predicted Cumulative sequential visibility
As shown in Figures 6.13a-c, Paul's Hill II turbines are only visible from 3 stretches of the route in conjunction with the blade tips of the operational, scenario 1 development of Paul's Hill I. As shown in Figures 6.13c-g Paul's Hill II turbines are not seen in conjunction with any additional scenario 2 or scenario 3 developments.
Magnitude of visual Change
Geographical Extent: ***Small.*** As demonstrated, in reality only glimpsed distant and partial views from along this route would be possible in a very small angle of the overall view, with only 4% of the total route length experiencing any theoretical visibility and having fully open views.

Sequential Road Route: B970
Size and Scale: ***Negligible***. Where visible, the proposed Paul's Hill II turbines would appear as barely perceptible blade tips on the distant horizon with over 17 km of intervening landscape features further filtering the view. There is very little overall actual visibility of the proposed development owing to the containing valley landform and intervening vegetation and density of built structures along the route.
Duration and Reversibility: ***Long term*** theoretically ***reversible*** change
Overall Magnitude of visual change: ***Slight*** Magnitude of overall visual change causing, where visible a barely perceptible change in the view as a result of the addition of new features on the skyline. Changes would be long term but theoretically reversible.
Magnitude of Cumulative Visual Change
Slight Magnitude of Cumulative Change in respect of the existing/consented developments (scenario 1). No visual change for scenario 2 and 3 developments which are not visible from along this route. No additional cumulative visual change over and above that predicted in the LVIA. Magnitude of Cumulative Change remains Slight.
Visual Effect
Moderate and ***Not Significant***. Considered not significant owing to the barely perceptible actual visibility throughout the route due to the distance from the proposed development, containing valley and intervening vegetation, together with the very slight level of visual change. The moderate level of overall visual effect arises primarily from the high sensitivity of this route.
Cumulative Visual Effect
Moderate and ***Not Significant*** for scenario 1 developments***.*** Remains Moderate and Not significant for scenarios 2 and 3.

Photographic Figure 6.12: Illustrative Photograph looking south-south-eastwards north of Scottackleys, adjacent to the proposed site location for the consented Meikle Hill Wind Farm development illustrating the openness toward the proposed Paul's Hill II development area from along the C13E route

C13E Unclassified Road - Dallas to Upper Knockando

6.9.70 This local road route within the study area runs for 11.76 km from the B9010 road route outside Dallas to Upper Knockando and the B9102. This is a well-used local connecting and access road. Cartographic desktop study and site verification has identified that for 39% of its length, it is largely visually contained by local valley depressions and enclosing hills and high points throughout the upland plateau, together with extensive forestry.

6.9.71 The route lies 4.3 km from the proposed development at its closest point outside Upper Knockando, beginning within the Rolling Farmland and Forests with Valleys LCT 5a and then ascending onto the plateau of the Upland Moorland and Forestry LCT 10, before descending into the Broad Farmed Spey Valley LCT 7 for the last 300m of the route. The entire of the C13E route lies within the study area.

6.9.72 Representative visualisations from this sequential route include Viewpoint 4 Minor road, Knockando to Dallas, nr. Aultnahuish (Figure 6.14d), and Viewpoint 7, Upper Knockando (Figure 6.14g). The Viewpoint locations are shown on the Sequential Route visibility ZTV maps for the C13E (Figure 6.10c). Photographic Figure 6.12, and Photographic Figure 6.13 below show illustrative examples of the changing enclosure of the C13E route from the north and south of the position of Viewpoint 4 and Photographic Figure 6.14 indicates forestry enclosure of the route from north of the Upper Knockando settlement

Photographic Figure 6.13: Illustrative Photograph looking south-westwards across the restructured forestry toward the operational Paul's Hill I development, taken from south of the disused building at Yellowbog and opposite the operational Rothes I and II developments which feature 'behind' the viewer from along this stretch of the C13E route.

Photographic Figure 6.14: Illustrative Photograph looking north-north-westwards north of Pitchaish illustrating the forestry enclosure along this stretch of the C13E route.

Table 6.46: Assessment of potential effects on the C13E Sequential Road Route

Sequential Road Route: C13E Minor road Dallas to Knockando
Sensitivity
Value of the view: ***Low***. Well used local connection route. The viewpoint is not recognised by any landscape or scenic designations.
Susceptibility: ***Low***. This is a local access road where the purpose of the viewer is generally to travel and where the view is not important to the journey.
Overall Sensitivity: ***Low*** sensitivity as this is a local transport route which passes through substantial areas of commercial forestry and where the focus is on travel, not on the landscape.
Existing sequential visibility (Including cumulative baseline 1)
The general existing views from this route consist of isolated properties, extensive forestry under various stages of restructuring and the open rough grassland and moorland of the plateau. The operational turbines of Rothes I and Rothes II dominate views from the central parts of the route and distant views occur as glimpses from occasional open stretches to the skyline of the more rolling hills containing the operational Berryburn and Paul's Hill I Wind Farm developments and the proposed Paul's Hill II Wind Farm development area. With reference to the cumulative ZTV of scenario 1, operational and under construction wind farm developments, Figure 6.13h, there is theoretical visibility of operational developments for the whole length of the route with the exception of a 500m gap in visibility of operational turbines owing to the landform screening provided by the Carin of Ballindean landform. As shown in Figures 6.13a, b and c, Paul's Hill I turbines are visible for the length of the route and Berryburn turbines visible throughout, with the exception for the last 1 km length as the road descends into Upper Knockando preventing views of the more interior sections of the rolling uplands where the Berryburn development is located. Views of the operational Paul's Hill I turbines appear as relatively distant hubs and blade tips for much of the route with some closer visibility as the route approaches Upper Knockando as illustrated in Viewpoint 7, Figure 6.14g.
Predicted sequential visibility (including cumulative baseline 1)
The C13E route rises to cross the forested moorland plateau containing the Rothes I and II Wind Farm developments, allowing open views south-westwards across the moorland with 87% of the route length experiencing theoretical visibility of the proposed development. The detailed ZTV in Figure 6.10c indicates theoretical visibility from the beginning of the route in Dallas at the war memorial and central road junction but intervening forestry on the higher ground surrounding the village prevents actual visibility towards the proposed development. The route then rises up the plateau side slopes with some gaps in visibility and passes through the Hillockhead plantation which prevents actual visibility outwith the immediate road route. Following the end of the plantation, visibility is relatively open as illustrated by Photographic Figure 6.12. Further south visibility is represented by Viewpoint 4 near the property access to Aultnahuish which indicates the roadside vegetation which allows only intermittent views from along this stretch toward the proposed development and the prominence of the Rothes I and II operational developments which detract from views toward the proposed development. Heading south along the route, the extensive forestry associated with Glen Lossie provides a range of levels of enclosure depending on the felling operations and restructuring timetable. This results in varying levels of visibility, all with some degree of filtering through forestry. South of here, the last 3.5 km of the route show almost continuous theoretical visibility until the end of the route at Upper Knockando but in reality localised landform, property infrastructure and roadside woodland filters views toward the site. Any visibility possible from this stretch is represented by Viewpoint 7, which indicate moderate levels of visual change from this location, as assessed in detail in Table 6.30. Once the route ends in the village of Upper Knockando the road drops into the wooded shallow valley and actual visibility toward the site is screened.
Predicted Cumulative sequential visibility
As shown in Figure 6.13h, Paul's Hill II turbines are entirely visible in conjunction with scenario 1 developments, often as a continuation of the Berryburn and Paul's Hill I line of turbines from central parts of the route with successive views of Rothes I and II as prominent features in another angle of view from Paul's Hill II. As shown in cumulative ZTVs Figures 6.13c-g scenario 2 developments theoretically visible in conjunction with Paul's Hill II from the minor road route include the scenario 1 developments and the Consented Meikle Hill and Kellas from northern parts of the route where Meikle Hill turbine in particular are in close proximity to the route and would form a detracting dominant feature leading to views of Paul's Hill II turbines being less perceptible to the viewer. In addition, the consented Dorenell and Clashindarroch developments would be visible as more distant turbines in another angle of view from the proposed Paul's Hill II turbines from the southern section of the route, around the Glen Lossie plantation area where in reality localised landform and remaining forestry cover would prevent most views of these scenario 2 developments. Hill of Glaschyle also indicates some visibility from this southern section in Figure 6.13g. The scenario 2 consented development of Cairn Duhie would not be visible from the route. Theoretical visibility occurs of

Sequential Road Route: C13E Minor road Dallas to Knockando
scenario 3 Dorenell Extension and Variation developments as they would appear as more distant turbines in another angle of view from the proposed Paul's Hill II turbines from the southern section of the route, around the Glen Lossie plantation area where in reality localised landform and remaining forestry cover would prevent most views of these scenario 3 developments. The scenario 2 and 3 developments are well separated geographically from the proposed Paul's Hill II development with any combined visibility generally being successive visibility in different angles of view.
Magnitude of visual Change
Geographical Extent: ***Medium.*** Theoretical visibility extends for 87% of the overall route with actual visibility from areas with full openness occurring from 18% of the route and from areas with more intermittent visibility occurring from 39% of the route. In reality short stretches of visibility of Paul's Hill II turbines at various distances would be possible along the route which would be interrupted by stretches of no visibility or well screened visibility. Where visible, the proposed development would affect a small portion of the overall vista from the route and visibility would be mitigated by the prominence of the operational Rothes I and II Wind Farm developments. *Size and Scale:* ***Minor***. Throughout the route as a whole, only localised views of the proposed development would be possible with negligible to minor levels of visibility possible from the northern and more distant parts of the route and more moderate levels of size and scale of visual change possible from the southern parts of the route closer to the proposed development. This results in an overall minor level for the route as a whole, taking into account the relationship of the proposed development with the operational developments visible from the route. *Duration and Reversibility:* ***Long term*** theoretically ***reversible*** change *Overall Magnitude of visual change:* ***Moderate*** Magnitude of overall visual change causing, where visible a noticeable change in the view as a result of the additional of new features on the skyline which would only be visible from a restricted number of locations throughout the route. Changes would be long term but theoretically reversible.
Magnitude of Cumulative Visual Change
Moderate Magnitude of Cumulative Change in respect of the existing/consented developments (Scenario 1). The dominating presence of the consented Meikle Hill is considered to result in a reduction in the magnitude of cumulative change for Scenario 2 to ***Slight*** as a large section of the route would be dominated by the successive view of Meikle Hill and Rothes I and II developments combined which feature in the opposite angle of view to the proposed development. No perceptible combined additional visual change for scenario 3 developments owing to the geographical separation of these developments from Paul's Hill II. Magnitude of Cumulative Change remains Slight.
Visual Effect
Minor and ***Not Significant***. Considered not significant owing to the limited actual visibility throughout the route due to the extensive forestry and where it is visible, the visibility of the proposed development in the context of operational developments principally Paul's Hill and Rothes I and II.
Cumulative Visual Effect
Minor and ***Not Significant*** for Scenario 1 developments***.*** Reduces to ***Negligible/Minor*** and Not significant effect for scenarios 2 and 3, owing to the dominating presence of Meikle Hill adjacent to the toad route.

Speyside Way

6.9.73 The total length of the Speyside Way is 116.3 km within the study area and beyond the study area. Included in this route is the SW04 Moray Core Path route which stretches from Cragganmore to Craigellachie along the Speyside Way route. In addition this route also includes the 'Moray Way' which follows the Speyside Way route from Craigellachie to Cromdale. This is a popular long distance walking route, following the River Spey with some higher level route options which overlook the valley. Cartographic desktop study and site verification has identified that for 46% of its length, it is largely visually contained by localised landform including enclosing hills of the Spey Valley, woodland and forestry blocks and built structures.

6.9.74 The route lies 4.3 km from the proposed development at its closest point at Tamdhu Distillery. It begins in the coastal margins and passes through upland farmland to broadly follow the Spey Valley running through the Lower Strathspey and Strathspey Glen Landscape Character Areas, until the route passes out of the study area.

6.9.75 Representative visualisations from this sequential route include SEQ04 Speyside Way, West of Carron (Figure 6.15d) Viewpoint 1, Tormore Distillery (Figure 6.14a), which lies 800 m to the east along the A95 from where the Speyside Way route crosses the A95. Viewpoint 5 Carn a Ghille Chearr (Figure 6.14e) and SEQ01 A95, Cromdale (Figure 6.15a) also illustrate potential views from the Speyside Way. Photographic Figures 6.13 and 6.14 illustrate wooded areas of the Speyside Way route from areas showing theoretical visibility.

Photographic Figure 6.15: Illustrative Photograph looking westwards taken to the east of Aberlour illustrating the dense wooded enclosure along parts of the Spey Valley and Speyside Way route.

Photographic Figure 6.16: Illustrative Photograph looking westwards taken at Dailuaine Halt illustrating the dense wooded enclosure of the Speyside Way route along this area of theoretical visibility.

Table 6.47: Assessment of potential effects on the Speyside Way Sequential Route

Sequential Road Route: Speyside Way
Sensitivity
Value of the view: ***High***. Popular visitor route that is well promoted by tourist literature. Passes through the Local landscape designation of the Spey Valley AGLV and the National landscape designation of the CNP. *Susceptibility:* ***High***. This is a main advertised footpath and the attention of walkers/route users on this scenic route are focussed on the landscape. *Overall Sensitivity:* ***High*** sensitivity of this route.
Existing sequential visibility (Including cumulative baseline 1)
The general existing views from this route consist of a markedly changing landscape from coastal flatlands to rolling upland farmland, forested hills and the broad agricultural Spey Valley. The route passes through settlements and properties, industrial complexes associated with the whisky industry and experiences changing levels of tree cover including roadside vegetation, policy woods and forestry plantations with stretches of open views to the often forested/wooded valley side slopes and views along the valley. With reference to the cumulative ZTV of scenario 1, operational and under construction wind farm developments, (Figure 6.13h) and cumulative ZTVs Figures 6.13a-c, there is some theoretical visibility of operational developments. Scattered patches of visibility of Berryburn exist through Craigellachie and around Aberlour. More extensive stretches of visibility occur of Hill of Towie I Wind Farm with a broken line of theoretical visibility between Buckie and Cromdale. Theoretical visibility of Paul's Hill is largely concentrated between
Sequential Road Route: Speyside Way
Craigellachie and Cromdale in a broken line of visibility. The largely low lying nature of the Speyside Way allows more partial visibility of hubs and blade tips of Berryburn and Paul's Hill I where they would be visible emerging above the containing side slopes of the Spey. Rothes I development would also be theoretically visible to the north of Craigellachie and around Ballindalloch though in reality wooded side slopes of Ben Aigan and the Ballindalloch policy woods reduce this visibility further.
Predicted sequential visibility (including cumulative baseline 1)
The higher level rolling farmland and scattered forested hills separating the coastal plain and the broad Spey Valley screens visibility from the lower reaches of the Spey and the Speyside Way to the north, at Buckie, with the exception of very small glimpses of partial visibility which in reality would not affect the route owing to localised screening. A 1 km stretch of partial theoretical visibility between 1-4 turbines occurs north of Ben Aigan and a secondary 1km broken line of theoretical visibility on the lower slopes of Ben Aigan, with large gaps in visibility caused by the screening provided by this landform, as shown in Figure 6.10eiii, section F. However existing forestry prevents actual views. Visibility to the north of Craigellachie as the Speyside Way skirts the base of Ben Aigan are also prevented by dense birch woodland and potential views through the village are not possible as the route follows a sunken disused section of railway with high retaining walls preventing any outward views. Continuing south-westward, the route follows the visually contained Aberlour riverside where there is no visibility. South of Aberlour a patch of broken theoretical visibility experiences no actual visibility owing to light woodland enclosure. Figure 6.10eiii, section D, around Carron and Knockando indicates a patchy line of theoretical visibility of mainly 6-7 of the proposed turbines up to Tamdhu distillery and where SP19 joins the Speyside Way. SEQ04 Speyside Way, West of Carron (Figure 6.15d) represents the theoretical view of the proposed development from an open stretch of the Speyside Way route within this visibility block, near to the access road to the row of old railway cottages west of Carron and near to Birch view farmstead. The angle of the viewer is such that stacking occurs, 6 turbine hubs would theoretically be visible and the turbines appear as much closer and larger turbines than the existing Paul's Hill I turbines. However, in reality, intervening woodland close to the river screens views toward these distant hills containing the proposed development and would block this view. Heading south, the route continues through dense woodland with no outward views and a long stretch of no visibility occurs south of Upper Knockando as the route follows the River and the forested lower slopes of the rolling hills which contain the river valley serve to block any outward views toward the proposed development, such as in the vicinity of Scoot More Plantation. Theoretical visibility picks up again west of Tormore Distillery, as represented by Viewpoint 1, Figure 6.14a, as the footpath route climbs up the slope to join the A95, 800m west of the distillery after crossing the river at Cragganmore. Table 6.24 includes a full assessment of Viewpoint 1 and concludes a localised moderate/major and significant effect. This significant effect would be possible for a short stretch of approximately 750m of this route, looking northwards as the path climbs the lower slopes of Tom a Chait. The route then enters Garvault and Woods of Knockfrink plantations where actual visibility is prevented. As shown in Figure 6.10ei Sections B and C, a split in the route leads to a 2.5 km stretch of theoretical visibility which skirts the base of the Cromdale hills, with varying levels of partial visibility from an approximate distance of 9.5 km from the proposed development and a higher level route up and around Tom an Uird Wood. In this area, Viewpoint 5, representing the summit of Carn a Ghille Chearr at the top of the slope from these sections of the Speyside Way is assessed in Table 6.28 where a moderate and not significant effect is concluded owing to the limited portion of the view affected, the moderate distance from the viewer, and the mitigating screening factors of the full height of the proposed turbines. At a far lower elevation with fewer proposed turbines visible from either of the footpath routes, the predicted effect would be further reduced. Stretches of screening woodland and forestry plantation also further filter actual views from these stretches of the Speyside Way toward the proposed development. SEQVP01 A95 Figure 6.15a at Cromdale also represents a possible theoretical view, particularly from the higher level route as it passes through the village of Cromdale. This shows a barely perceptible glimpsed view of the proposed development. Any further visibility as the route

Sequential Road Route: Speyside Way
progresses southwards is looking northwards and would be an even more distant view than that depicted in SEQ01, A95 at Cromdale. In addition, the extensive Abernethy forestry around Nethy Bridge and the infrastructural development around Aviemore would prevent actual views even further south along the Speyside Way.
Predicted Cumulative sequential visibility
As shown in Figure 6.13h, Paul's Hill II turbines are mostly visible in conjunction with the Paul's Hill I scenario 1 development, between Craigellachie and Cromdale for long stretches of broken and varying partial visibility. As shown in cumulative ZTVs Figures 6.13f and d scenario 2 developments theoretically visible from the Speyside Way route include the scenario 1 developments and small patches of combined visibility with Meikle Hill around Knockando where enclosing vegetation limits actual views. Some limited combined visibility occurs with Hill of Towie II, from west of Aberlour and limited combined visibility with Dorenell, north of Craigellachie but enclosing vegetation limits actual views of both developments. There is no visibility of the consented Cairn Duhie development from any part of the Speyside Way. Scenario 3 proposed developments Dorenell Extension and Variation are theoretically visible in conjunction with Paul's Hill II development from east of Carron and north of Craigellachie. SEQ04 West of Carron, demonstrates no theoretical visibility of any other wind farm development other than the operational Paul's Hill I development. Overall, in reality these scenario 2 and 3 developments are well separated from Paul's Hill II proposed development and would be seen in a different angle of view successively which reduces cumulative effect with the addition of the proposed Paul's Hill II development to the scenario 2 and 3 baselines.
Magnitude of visual Change
Geographical Extent: ***Small.*** A total of 31% of the route would experience theoretical visibility but only 14% of this total route length experiencing any theoretical visibility has some degree of openness with 86% experiencing some degree of enclosure preventing actual visibility. As demonstrated by SEQ04 west of Carron, this location of theoretical visibility of the proposed development and relative openness still would have no actual visibility of the proposed development owing to intervening vegetation set back from the route but still obscuring the skylining hills containing the proposed development. This 14% of the overall route potentially affected by the proposed development would therefore be further reduced. From these highly localised locations, where the proposed development would be actually visible from the Speyside Way, such as around Tormore Distillery, the proposed development would affect only a narrow portion of overall vista from the route. *Size and Scale:* ***Minor***. Throughout the route as a whole, only highly localised views of the proposed development would be possible with most possible views being of part of the development such as blade tips or distant views. There is no actual visibility of all of the proposed development owing to the containing valley landform and intervening vegetation along the route. *Duration and Reversibility:* ***Long term*** theoretically ***reversible*** change *Overall Magnitude of visual change:* ***Slight*** Magnitude of overall visual change along the whole 116.3 km of the route owing to the very few occasions of visibility of the proposed development. Changes would be long term but theoretically reversible.
Magnitude of Cumulative Visual Change
Slight Magnitude of Cumulative Change in respect of the existing/consented developments (scenario 1). No perceptible combined visual change for scenario 2 and 3 developments. No additional cumulative visual change over and above that predicted in the LVIA for scenarios 2 and 3. Magnitude of Cumulative Change remains Slight.
Visual Effect

Sequential Road Route: Speyside Way
Moderate and ***Not Significant***. Considered not significant owing to the very limited actual visibility throughout the route due to the containing valley, intervening vegetation and enclosing vegetation along much of the route and the visibility of the proposed development where it is visible in the context of the operational development of Paul's Hill. In addition, a key characteristic of the Speyside Way is the disappearance and reappearance of the Spey River and this element would remain unaffected by the proposed development.
Cumulative Visual Effect
Moderate and ***Not Significant*** for scenario 1 developments***.*** No additional cumulative visual effect over and above that predicted in the LVIA for scenarios 2 and 3.

Moray Core Paths SP19 and SP20

6.9.76 The total length of both the SP19 and SP20 Moray Core Path routes extend for 2.67 km. Nearby logging operations around Core Path SP20 and the overgrown nature of the connecting section between SP20 and SP19 suggests no regular use of this combined path. SP19 follows a public highway. Cartographic desktop study and site verification has identified that for 63% of its length, it is largely visually contained by localised landform, mixed woodland and built structures.

6.9.77 The route lies 5.2 km from the proposed development at its closest point and passes from the upper slopes of the Broad Farmed Spey Valley LCT7 to the Upland Moorland and forestry LCT10 travelling northwards along the combined route. The entire of the combined SP19 and SP20 Core Path route lies within the study area.

6.9.78 Representative visualisations from this sequential route include Cultural Heritage CH05 Knockando Kirkyard, (Figure 9.6), just to the west off the Core Path route, from the open kirkyard accessed from the route.

Table 6.48: Assessment of potential effects on the Moray Core Path Routes SP19 and SP20

Sequential Road Route: Moray Core Path Routes SP19 and SP20
Sensitivity
Value of the view: ***Medium***. A Core Path route partly along a metalled road in the southern part of SP19 covered by the local landscape designation of the Moray Spey Valley AGLV. The route becomes a dirt track and forestry logging track along SP20. Very little waymarking and overgrown vegetation near to the entrance to SP20 from the B9102 suggests a lack of regular use. *Susceptibility:* ***High***. This is an identified Core Path footpath where the attention of the viewer is generally on the surrounding landscape. *Overall Sensitivity:* ***Medium*** sensitivity of this route.
Existing sequential visibility (Including cumulative baseline 1)
The general existing views from this route consists of scattered building features with some heritage value including Tamdhu Distillery, Knockando Church and kirkyard and Cardhu Country House. Dense woodland often lines both paths until SP20 opens out past Upper Borlum Farm to look out across the fringe moorland. As shown in the cumulative ZTV of scenario 1, operational and under construction wind farm developments, Figure 6.13h, Operational turbines are not visible from the southern part of the SP19 owing to its position in the shallow valley of Knockando Burn. Theoretical visibility begins again north of the access road into Knockando Mill but dense roadside vegetation restricts all visibility outwards. This screening and visual containment continues as SP19 reaches the B9102 road and then departs from the road to become a narrow,

wooded path rising up the slope away from the B9102 road toward Knockando Church and Kirkyard. Dense woodland continues to prevent visibility of operational turbines until the view opens out behind the church and off the SP20 Core Path route. Western views from the path itself are filtered through pathside vegetation. Theoretical visibility toward the operational Paul's Hill turbines continues northwards along the SP20 route but residential properties, Knockando School and Upper Borlum Farm and associated vegetation restricts actual visibility. Further north views open out slightly but some overgrown hedgerow and banking filters western views toward Paul's Hill and Berryburn which also shows theoretical visibility. Theoretical visibility of Hill of Towie I development is also visible from the northern parts of the SP20 route although the distance and intervening forestry and logging piles reduce actual visibility toward this distant development. In reality, visibility of both Berryburn and Paul's Hill I operational developments would be possible as glimpsed views through gaps in the light pathside vegetation until the end of the SP20 route at the minor road.

Predicted sequential visibility (including cumulative baseline 1)

Approximately 420m of the 1 km length of SP19 shows theoretical visibility of the proposed development. In reality, enclosing vegetation associated with the Knockando Burn shallow valley and the route of the River Spey restrict all outward views from the SP19 route. Theoretical visibility is shown from the entire route of the SP20 Core Path. In reality views from the route itself are restricted to glimpsed views westwards through gaps in the kirkyard perimeter vegetation at the southern end of the route. Visibility from the Country House and School further to the north are also filtered through perimeter vegetation with glimpsed and partly screened views of up to 6 hubs and one further blade tip as illustrated by the open view represented by CH05 from the rear of Knockando Kirkyard which has clear uninterrupted views toward the rolling hills containing the proposed development but that lies off the Core Path route. North of Upper Borlum Farm, passed the farm ancillary buildings and perimeter vegetation which restrict outward views from the path route, longer stretches of open views are possible toward the rolling uplands of tips and nacelles of all the proposed turbines from a distance of over 5 km. As the footpath rises up toward the moorland, views become more open. Overall, actual visibility is restricted to patches of open views from the northern section of SP20 Core Path north of Upper Borlum Farm where the proposed Paul's Hill II Wind Farm development would be seen in conjunction and as an extension to the operational Paul's Hill development.

Predicted Cumulative sequential visibility

As shown in Figure 6.13h, Paul's Hill II turbines are entirely visible in conjunction with the scenario 1 operational Paul's Hill I development from along both Core Path routes, particularly the northern part of SP20 route where some actual visibility would be possible. Berryburn would also be visible from this section of SP20 and Paul's Hill II turbines would appear as a closer extension, to the viewer, of this wind farm cluster. As shown in cumulative ZTVs Figures 6.13c-g scenario 2 developments theoretically visible in conjunction with Paul's Hill II particularly from the northern part of SP20 Core Path, include the more distant development of the consented Dorenell and Hill of Towie II. There is no visibility of the consented Cairn Duhie development from any part of these Core Paths. The scenario 3 developments of Dorenell Variation and Extension are also theoretically visible from this northern part of SP20 but in reality these scenario 2 and 3 developments are well separated from Paul's Hill II proposed development, seen in a different angle of view successively and views in this direction have some screening provided by existing forestry currently undergoing forestry felling and restructuring works which also detract from the distant view toward these developments. This reduces any cumulative effect with the addition of the proposed Paul's Hill II development to the scenario 2 and 3 baselines.

Magnitude of visual Change

Geographical Extent: ***Medium***. No effect is predicted for the SP19 section of this continuous route but a medium level of geographical extent is considered for SP20 Core Path owing to the actual visibility possible from the northern section of this route albeit affecting only a small viewing angle. Theoretical visibility extends

Sequential Road Route: Moray Core Path Routes SP19 and SP20

to the whole length of the SP20 route and 76% of the combined SP19 and SP20 route. Paul's Hill II turbines would appear in the context of a closer extension, to the viewer, of the original Paul's Hill I and Berryburn Wind Farm cluster.

Size and Scale: ***Moderate.*** No effect is predicted for the SP19 section of this continuous route but a moderate level of Size and Scale element of magnitude is considered for SP20 Core Path owing to the actual visibility possible from the northern section of this route and the difference in scale which would be discernible from those areas where clearer, open views towards the proposed development are possible. Throughout the route as a whole, actual views of the proposed development would be localised to the last 800 m of the SP20 route.

Duration and Reversibility: ***Long term*** theoretically ***reversible*** change for the continuous route.

Overall Magnitude of visual change: ***Moderate*** Magnitude overall visual change for continuous route owing to the localised nature of the actual visibility along this well enclosed continuous SP19 and SP20 Core Path route. Where visible, the proposed development would appear as a noticeable change in the view as a result of the addition of new features on the skyline. Changes would be long term but theoretically reversible.

Magnitude of Cumulative Visual Change

Moderate Magnitude of Cumulative Change in respect of the existing/consented developments (Scenario 1). No additional cumulative visual change over and above that predicted in the LVIA for Scenarios 2 and 3. Magnitude of Cumulative Change remains Moderate.

Visual Effect

Moderate and ***Not Significant***. Primarily relates to the SP20 route as no effect is predicted on the SP19 route. Overall visual effect on SP20 Core Path and SP19 and SP20 combined Core Path considered to be not significant owing to the visibility of the proposed development in the context of the operational Paul's Hill I and Berryburn turbine clusters and the localised visibility restricted to the last approximately 800 m of the SP20 Core Path route. In addition, forestry operations and overgrown vegetation on other parts of the route suggest a lack of regular use of this Core Path route, resulting in a medium rather than a high overall sensitivity.

Cumulative Visual Effect

Moderate and ***Not Significant*** for scenario 1 developments***.*** No additional cumulative visual effect over and above that predicted in the LVIA for scenarios 2 and 3.

Summary of Effects from Sequential Routes

6.9.79 Four sequential routes have been identified as experiencing ***Moderate*** levels of sequential visual effect. These include the A95 main route along the Spey Valley, the B970 from Grantown to Aviemore and beyond the study area, the Speyside Way long distance footpath from Buckie to Aviemore and beyond the study area, and Core Path SP20.

6.9.80 These moderate sequential effects are considered to be ***Not Significant*** owing to the highly localised nature and restricted actual visibility along all four routes and in the case of the B970, such actual visibility of the proposed development is barely perceptible. The magnitude of visual change is also considered to be slight for the A95, the B970 and the Speyside Way and a moderate visual effect has been primarily considered, due to the high sensitivity of these sequential routes rather than any high levels of predicted visual change. A moderate level of visual change is considered for Core Path route SP20 but in reality only the last 800m of the northern, elevated part of the route would achieve visibility of the proposed development and forestry operations and overgrown vegetation on other parts of the route suggest a lack of regular use of this Core Path route.

6.9.81 The two sequential routes of the B9102 and the C13E minor road between Dallas and Upper Knockando are predicted to experience ***Minor/Moderate*** and ***Minor*** sequential visual effects respectively, owing to the limited actual visibility throughout both routes which are considered to be ***Not Significant*** effects. In the case of the

B9102, the extensive forestry, natural containment of lower lying stretches of the route and built residential/agricultural development along the route reduce the visibility, and in the case of the C13E route, the low sensitivity of the route due to extensive forestry and visual prominence of the Rothes I and II operational wind farm developments also mitigate potential effects as a result of the proposed development resulting in not significant effects.

6.10 CONCLUSIONS

Summary of Effect on Landscape Fabric and character of the Proposed Development Area

6.10.1 The construction and decommissioning stages of the proposed Paul's Hill II Wind Farm would result in ground disturbance operations, track upgrades and new track/crane pad/hardstanding construction and decommissioning removal, construction of wind turbines and removal during decommissioning and general reinstatement works, together with vehicular/personnel movements on site. Such operations would result in direct effects on the landscape fabric of the development site area. This will include ground vegetation and soil removal and the introduction of new elements into the moorland context. It is considered the magnitude of change on the landscape resource of the site would be Moderate, resulting from a large geographical extent and major size and scale of proposed changes but for a short period of time. This results in a ***Minor*** and ***Not significant*** effect on the landscape resource of the proposed development area during the construction and decommissioning stages of the proposed development. The Minor effect results from the low sensitivity of the development area, being located adjacent to an operational wind farm site, and the short term nature of the proposed construction and decommissioning effects.

6.10.2 Following reinstatement post construction, the site area would enter the operational stage. The magnitude of change on the landscape resource of the site would remain ***Moderate***, resulting from the large geographical extent of the site area affected, the minor size and scale of proposed changes including the introduction of 7 vertical elements into the moorland and the long term, theoretical reversible nature of the changes. This is considered to result in a ***Minor*** and ***Not significant*** effect on the proposed development area during the operational stage of the proposed development. The Minor effect results from the low sensitivity of the development area, being located adjacent to an operational wind farm site.

Summary of Effect on Landscape Character

6.10.3 No unacceptable Significant effects are considered to occur from any Landscape Character Area/Type within the study area as a result of the addition of the proposed Paul's Hill II Wind Farm development.

6.10.4 Potential landscape effects during the Construction Phase for the LCT containing the proposed development; LCT11 Open Rolling Uplands is considered to be Moderate and significant. It is considered a significant overall landscape effect owing to the extent of operations and vehicular movements to and from the site within the LCT. Following reinstatement post construction, this landscape effect on LCT11 is predicted to be Moderate and Not significant, owing to the localised nature of the change, which is considered to be nearer the borderline minor/moderate magnitude level of change. Following reinstatement Post Decommissioning, the proposed development area will be returned to open moorland with no residual landscape effects predicted.

6.10.5 One out of the eleven identified LCAs/LCTs has been identified as potentially experiencing Moderate/Major and Significant landscape and cumulative effects for cumulative baseline 1 (operational wind farm developments). This is LCT7 Broad Farmed Valley as identified by MWELCS. The value of this landscape receptor is considered to be High due to its enclosed nature and importance of enclosing skylines and its rich heritage and cultural value linked to the Whisky industry. This resulted in a borderline Medium overall sensitivity, almost high. The Moderate magnitude of change at this viewpoint was largely based on the noticeable landscape change around Roy's Hill, an identified 'Landmark Hill' visible on the containing skyline as a result of the moderate contrast present between the different turbine sizes of the proposed and original Paul's Hill turbines and the medium geographical extent of visibility throughout the LCT. However, operational developments will generally be experienced at the same time as the proposed development and the landmark feature of Roy's Hill is not the only key landmark hill enclosing the LCT. All other distinctive hills enclosing LCT7 remain unaffected by the proposed wind farm development. These mitigating factors lead to the conclusion that this significant effect is an acceptable and localised significant effect.

6.10.6 A further eight of the remaining ten LCAs/LCTs were considered to experience a Moderate level of landscape effect which has been considered in each case to represent a not significant effect, owing to the localised nature of the identified landscape effect, the key characteristics and features of the landscape character remaining unaffected with often only one of the features affected, namely the visible skyline and the experience of the proposed Paul's Hill II Wind Farm turbines within the context of the operational Paul's Hill turbines. The proposed turbines are therefore nearly always being introduced into a mixed, often developed skyline rather than introducing turbines into a skyline with no turbine development. These Character Types/Areas experiencing moderate and Not Significant levels of landscape effect include the LCTs of LCT11 Open Rolling Upland, LCT12a Open Upland with Steep Slopes, LCT5a Rolling Farmlands and Forest and Valleys, MN10 Open Uplands, Areas 4 and 6 of the CNG2: Uplands and Glens, Area 14 of CNG3: Cairngorm Straths and LCA 83 Hills of Cromdale.

Summary of Effect on Landscape Designations

6.10.7 No Significant landscape effects are considered to occur from any of the three assessed landscape designations within the study area. Moderate and Not Significant levels of landscape effect have been considered for the Cairngorms National Park (and The Cairngorm Mountains NSA and Cairngorms WLA within the CNP boundary), the Drynachan, Lochindorb and Dava Moors SLA and the Spey Valley AGLV. These not significant effects arise from limited magnitude of landscape change from the CNP and from medium levels of sensitivity combined with moderate levels of landscape change for the two local landscape designations.

6.10.8 Overall, no Significant effects are considered to arise from potential landscape effects on each of the three designations as the proposed development would be experienced, particularly from elevated locations in the context of the operational development cluster of Paul's Hill I and Berryburn. In addition, the key characteristics and features of the designations would remain largely unaffected and the Special Qualities of each of the three designations as detailed in Table 6.19 and Table 6.20 would not be significantly affected as a result of the addition of the proposed Paul's Hill II Wind Farm development.

Summary of Effect on Selected Viewpoints

6.10.9 No unacceptable Significant effects are considered to occur from any of the VIA Selected Viewpoints, representing overall visual amenity throughout the study area, as a result of the addition of the proposed Paul's Hill II Wind Farm development.

6.10.10 One out of the ten selected viewpoints has been identified as potentially experiencing Moderate and Significant visual and cumulative effects for cumulative baseline 1 (operational wind farm developments). Viewpoint 1, taken from the frontage of Tormore Distillery is a close proximity viewpoint at 5.9 km from the proposed development. The susceptibility of the viewers, or receptors present at this viewpoint was considered to be High, as they included residents and tourists focussed on the landscape. This resulted in a Medium (borderline High) overall sensitivity. The Moderate magnitude of change at this viewpoint was largely based on the moderate contrast present between the different turbine sizes of the proposed and original Paul's Hill turbines and the small geographical extent of visibility, both in the angle of view affected, and the duration of visibility along the sequential route, as this is one of the few occurrences of visibility of the proposed development from the A95 road route. When combined with this higher level of susceptibility, a moderate effect was determined which was considered high enough to be a significant effect. However the effect was not considered sufficient to be a Moderate/Major effect as the view is an oblique view when travelling along the A95, and both the original and proposed Paul's Hill schemes overlap, creating some visual integration of the proposed development as an extension of the existing. The overall openness of the view is also retained and only a small part of the skyline is changed by the presence of additional features. These mitigating factors lead to the conclusion that this significant effect, experienced by receptors at a distance of 6 km from the proposed development is an acceptable and localised significant effect.

6.10.11 A further seven of the remaining nine viewpoints were considered to experience a Moderate level of effect which have been considered in each case to represent a not significant effect. These include the summit viewpoints of Ben Aigan, Ben Rinnes, Carn a Ghille Chearr and Carn Diamh, the settlement view from Archiestown and the A95

viewpoints 9 and 10 west of Aberlour and west of Ballindalloch. The summit viewpoints represent high sensitivity receptors such as walkers who have a strong focus on experiencing the wider landscape view. Owing to distance from the proposed development, some visual integration with the existing Paul's Hill I turbines and partial screening from intervening landform, the magnitude of change predicted from these elevated viewpoints is considered to be slight with a perceptible change occurring as a result of the proposals. It is considered that such lower levels of change result in a not significant effect on these viewpoints.

Summary of Effect on residential receptors

6.10.12 No unacceptable Significant effects are considered to occur from any residential receptors, including individual properties and settlement as a result of the addition of the proposed Paul's Hill II Wind Farm development.

6.10.13 Potential Major level visual effects have been identified from the Corglass Farm property mainly from open areas of the approach road and from unscreened northern boundary and temporary holiday let property within this property group. However, mitigating factors including the limited angle of view affected, the temporary nature of this residence and the heavily filtered views through dense mixed woodland screening across most of the rest of the property curtilage including the main property itself. This leads to this being considered an acceptable significant effect. Even in the event that trees around the curtilage of the property were removed, it is still considered that the visual effect from the property, due to the carefully designed layout, would be an acceptable significant effect.

6.10.14 A Moderate/Major level of visual effect has been identified from the Glenarder property owing to the proximity of the property to the proposed development, the high level of sensitivity and the clear uninterrupted visibility of the noticeable change to a currently undeveloped skyline. However the angle of overall view affected is very limited and open views remain in other directions from the property mainly along the Allt Arder Valley which, it is considered, mitigates this effect to an acceptable effect.

6.10.15 A Moderate level of effect has been identified from the Leakin Farm property, owing to potential views from within the curtilage and are considered a Significant effect owing to the high level of sensitivity of this residential receptor. However this is considered to be a borderline significant effects owing to the limited actual visibility throughout the curtilage of the property, together with the limited angle of view affected and the oblique angle of viewing.

6.10.16 No significant effects on the visual component of living conditions have been identified from any of the three assessed properties and their curtilages in this RVAA. Some major and moderate/major and significant levels of visual effect have been identified from parts of the access roads to Corglass and Leakin Farms owing to a lack of screening and in the case of Corglass Farm, the proximity to the proposed development. These effects are highly localised and when travelling by car would be of short duration.

6.10.17 Overall two significant effects and one borderline significant effect are identified from individual and isolated properties within 3 km of the proposed development. However screening, the carefully designed layout and the localised nature of these effects mitigate these effects which are assessed as not significantly affecting the overall visual component of living conditions for any of these three properties.

6.10.18 No significant visual effects have been identified from any of the four assessed settlements Some moderate levels of visual change have been identified from Upper Knockando and Archiestown within 10 km of the proposed Paul's Hill II Wind Farm development mainly due to the high sensitivity of the settlement receptors rather than any high level of visual change predicted. These effects are not considered significant owing to the limited actual visibility throughout the settlements resulting from the containing valley sides, settlement density, internal vegetation structure and/or surrounding intervening screening vegetation.

Summary of Effect on Sequential Routes

6.10.19 No Significant effects are considered to occur from any sequential routes as a result of the addition of the proposed Paul's Hill II Wind Farm development.

6.10.20 Four sequential routes have been identified as experiencing Moderate levels of sequential visual effect. These include the A95 main route along the Spey Valley, the B970 from Grantown to Aviemore and beyond the study area, the Speyside Way long distance footpath from Buckie to Aviemore and beyond the study area, and Core Path SP20.

6.10.21 These moderate sequential effects are considered to be Not Significant owing to the highly localised nature and restricted actual visibility along all four routes and in the case of the B970, such actual visibility of the proposed development is barely perceptible. The magnitude of visual change is also considered to be slight for the A95, the B970 and the Speyside Way and a moderate visual effect has been primarily considered, due to the high sensitivity of these sequential routes rather than any high levels of predicted visual change. A moderate level of visual change is considered for Core Path route SP20 but in reality only the last 800m of the northern, elevated part of the route would achieve visibility of the proposed development and forestry operations and overgrown vegetation on other parts of the route suggest a lack of regular use of this Core Path route.

Summary of Cumulative Effects

6.10.22 Overall potential cumulative effects of the proposed Pauls Hill II Wind Farm development, when seen in conjunction with cumulative baseline scenario 1 developments, i.e. operational and under construction developments are stated as the overall visual and landscape effect for each receptor which considers this baseline scenario as the LVIA baseline. Overall, the proposed development is seen in conjunction with the operational developments of Pauls Hill I and Berryburn from parts of the Open Uplands LCT, Open Rolling Uplands LCT, Upland Moorland and Forestry LCT, parts of the Strathspey valley landscapes and more northern parts of the Moray Coastal Farmland. More distant visibility of the proposed development within its broader upland context also lessens any potential difference in turbine height between these operational turbines and the proposed turbines. The presence of the operational developments provides an existing wind farm context and the proposed development forms a small modest addition to this existing wind farm array.

6.10.23 Combined visibility of the proposed development with the operational Rothes I and II developments follows a similar pattern of visibility to that described for the operational Pauls Hill I and Berryburn developments and in the case of specific sequential effects on the Dallas to Knockando road the operational developments of Rothes I and II mitigate and lessen potential effects of visibility of the proposed development, owing to the more prominent presence of the Rothes I and II developments from these locations. The Rothes developments also form part of the broader upland wind farm context as experienced from more distant receptors such as within the coastal farmlands and more distant Speyside valley landscapes and visual receptors within these landscapes which view the full breadth of the uplands and the operational wind farm developments they contain as a skyline backdrop.

6.10.24 The separation of Hill of Towie and Clashindarroch from the proposed development lessens combined visibility and any potential cumulative effects of the proposed development with these operational developments.

6.10.25 Cumulative Baseline Scenario 2 developments, i.e. consented but not yet constructed developments represents a likely future scenario. Meikle Hill provides some degree of mitigation from the sequential route of the Dallas to Knockando road and from the Upland Moorland and Forestry LCT landscape and associated visual receptors. Cairn Duhie provides substantial mitigation for potential effects on the Drynachan, Lochindorb and Dava Moors SLA and the Open Uplands LCT and associated visual receptors within these landscapes. This results from the close proximity of Cairn Duhie to sensitive receptors within these landscapes and the dominant feature of Cairn Duhie would mitigate any magnitude of change resulting from the addition of the Paul's Hill II Wind Farm on the more distant skylines to the east. The consented Dorenell wind farm development similarly mitigates potential

effects on the sensitive open upland with steep slopes LCT and associated visual receptors owing to its proximity of Dorenell to these receptors and proposed extent of this development.

6.10.26 Overall, the proposed Pauls Hill II wind farm development does not pose significant additional cumulative effects with cumulative baseline scenario 2 consented developments owing to the landscape fit of the proposed Paul's Hill II Wind Farm into the existing Paul's Hill array and the lack of new areas of visibility as a result of the proposed development where turbines were not present before.

6.10.27 Cumulative Baseline Scenario 3 developments, i.e proposed and not yet consented developments within the planning system represents the least likely future outcome considered in the CLVIA and includes the Variation and Extension proposals for Dorenell Wind Farm development which would replace the consented Dorenell scheme. Overall, the proposed Pauls Hill II Wind Farm development does not pose significant additional cumulative effects with cumulative baseline scenario 3 consented developments owing to the landscape fit of the proposed Paul's Hill II Wind Farm into the existing Paul's Hill Wind Farm and the lack of combined visibility with these other proposed wind farm developments owing to the geographical separation..

6.10.28 In general, no significant additional cumulative effects have been identified as a result of the addition of the proposed Pauls Hill II Wind Farm development to a baseline landscape comprising other consented or proposed wind farm developments, which comprise the CLVIA baselines. Any significant effects which have been identified throughout the LVIA as a whole are owing to any potential effects of the proposed development by itself, within the LVIA existing baseline of operational and under construction developments. Generally, the introduction of the proposed development into this baseline of operational developments is mitigated by the prominent occurrence of operational developments or the landscape fit of the proposed development within the existing Pauls Hill Wind Farm. Similarly, the introduction of the proposed development into the cumulative baseline of consented developments is substantially mitigated by the dominating presence of consented developments such as Cairn Duhie, Meikle Hill and Dorenell. Such mitigating effects are detailed throughout the LVIA and combined CLVIA.

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Chapter 7

Ecology Assessment

Contents

FIGURES

Glossary

Term	Definition
Baseline	The existing conditions that prevail against which the effects of the proposed wind farm development are compared.
Blanket bog	Blanket bog is peatland habitat confined to cool, wet, typically oceanic climates. The term blanket 'bog' strictly applies only to that portion of a blanket 'mire'.
Ecological Impact Assessment	Ecological Impact Assessment (EcIA) is a process of identifying, quantifying and evaluating potential effects of development-related or other proposed actions on habitats, species and ecosystems.
Environmental Impact Assessment	Environmental Impact Assessment (EIA) is a means of drawing together, in a systematic way, an assessment of the likely significant environmental effects arising from a proposed development.
Environmental Statement	A document reporting the findings of the EIA and produced in accordance with the EIA Regulations.
Habitats	The area or environment where a plant or species naturally occurs.
Mitigation	Measures, including any process, activity or design to avoid, reduce, remedy or compensate for adverse effects of a development.
Protected Species	Animals or plants protected by European legislation – The Conservation of Habitats and Species (Amendment) Regulations 2012 – and/or national legislation – The Wildlife and Countryside Act 1981 (as amended).
Site of Special Scientific Interest (SSSI)	SSSIs are protected areas that represent the UK's very best wildlife and/or geological sites.
Special Area of Conservation (SAC)	An internationally important area for nature conservation designated under The Conservation of Habitats and Species (Amendment) Regulations 2012.
Scottish Biodiversity List (SBL)	A list of animals, plants and habitats that Scottish Ministers consider to be of principal importance for biodiversity conservation in Scotland.
Biogeographic scale	The geographical extent of species cumulatively assessed.

List of Abbreviations

Abbreviation	Description
AA	Appropriate Assessment
ASPT	Average Score Per Taxon
BAI	Bat Activity Index
BMWP	Biological Monitoring Working Party
BPS EA	Basic Payment Scheme Environmental Assessment
CEMP	Construction Environmental Management Plan
CIA	Cumulative Impact Assessment
CIEEM	Chartered Institute of Ecology and Environmental Management
CMS	Construction Method Statement
EcIA	Ecological Impact Assessment
ECoW	Ecological Clerk of Works
EEC	European Economic Community
EIA	Environmental Impact Assessment
EPS	European Protected Species
ES	Environmental Statement
FCS	Forestry Commission Scotland
FMP	Fish Monitoring Programme

Abbreviation	Description
FNLFT	Findhorn, Nairn & Lossie Fisheries Trust
GIS	Geographic Information System
GWDTE	Ground Water Dependant Terrestrial Ecosystem
HMP	Habitat Management Plan
HRA	Habitat Regulations Appraisal
IEF	Important Ecological Feature
JNCC	Joint Nature Conservation Committee
LBAP	Local Biodiversity Action Plan
LNR	Local Nature Reserve
LSE	Likely Significant Effect
MAGIC	Multi-Agency Geographic Information for the Countryside
NTAXA	Number of taxa
TMC	The Moray Council
MSS	Marine Scotland Science
NBN	National Biodiversity Network
NESBReC	North-east Scotland Biological Records Centre
NNR	National Nature Reserve
NVC	National Vegetation Classification
ODPM	Office of the Deputy Prime Minister
PAN	Planning Advice Note
RSPB	Royal Society for the Protection of Birds
SAC	Special Area of Conservation
SBL	Scottish Biodiversity List
SEPA	Scottish Environment Protection Agency
SFB	Spey Fisheries Board
SFCC	Scottish Fisheries Coordination Centre
SG ECU	Scottish Government Energy Consents Unit
SNH	Scottish Natural Heritage
SPP	Species Protection Plan
SSSI	Site of Special Scientific Interest
SUDS	Sustainable Urban Drainage Systems
SWT	Scottish Wildlife Trust
UKBAP	UK Biodiversity Action Plan
WFD	Water Framework Directive

7.1 INTRODUCTION

7.1.1 This chapter provides an overview of baseline ecological conditions within the Paul's Hill II Development Area and immediate surrounding environment. Following the scoping for Ecological Impact Assessment (EcIA) that was undertaken in 2017[1], this chapter focusses only on those ecological features which could be significantly affected by the proposed wind farm, or for which the predicted effects were unknown at the time of scoping, in line with the updated CIEEM guidelines[2].

7.1.2 The potential ecological effects of the proposed wind farm development during construction, operation and decommissioning are identified, assessed and evaluated in terms of their significance, in accordance with industry guidelines[2,3]. Cumulative impacts at an appropriate biogeographic scale are described and an assessment of residual impacts, taking into consideration proposed mitigation measures, is also provided. Several elements of this chapter relating to the identification and assessment of ecological receptors make reference to and are supported by the findings of the ornithological and hydrological assessments, reported in Chapter 8: Ornithology Assessment and Chapter 10: Hydrology, Geology and Hydrogeological Assessment of the Environmental Statement (ES).

7.1.3 Baseline ecological conditions have been established through combining the results of a desk-based review and ecological field surveys to obtain relevant ecological data in order to ascertain the status of habitats and protected species occurring within the Paul's Hill II Wind Farm Development Area and immediate surrounding environment. However, there is not any survey data for the access route for abnormal deliveries from the main A95 road along the B9138 and B9102 roads to the access track of the existing Paul's Hill Wind Farm, and the cable route to the substation at Glenfarclas. This section of the proposed wind farm development may have impact upon habitat and trees lining the route, for example (although dependent on the turbine model and turbine delivery method the existing access route may suffice without adaptation). When full details of the abnormal delivery route and grid route have been finalised, essential surveys (if required) to inform and assess the potential impacts associated with this section of the Paul's Hill II Development Area will be submitted, and appropriate mitigation proposed.

7.1.4 Information gathered from previous assessments undertaken at the existing development (Paul's Hill Wind Farm) has also been utilised in this assessment, providing background and contextual information. The baseline studies referenced in this chapter are supported by the following technical appendices which provide detailed information regarding the ecological field survey methods and field data:

- Technical Appendix 7.1: Habitat and mammal (excluding bats) data;
- Technical Appendix 7.2: Bat Survey Report; and
- Technical Appendix 7.3: Fish and Macro-invertebrate Survey Reports.

7.1.5 The ecological impact assessment (EcIA) has been undertaken on the basis that mitigation by design measures provided within this ES will be incorporated into the proposed wind farm development design, construction and operation, where appropriate. These embedded mitigation measures are expected to avoid or minimise any potentially significant adverse ecological impacts.

7.2 TERMINOLOGY

7.2.1 The following zones are defined within this chapter and its appendices:

- 'The ownership boundary' refers to the entire Paul's Hill estate, within which the existing Paul's Hill Wind Farm and the proposed wind farm development, along with any mitigation are sites;
- 'The existing development' refers to the original/existing Paul's Hill Wind Farm;

[1] Natural Power, 2017. Paul's Hill II Wind Farm Scoping Report. Document reference: 1129813

[2] CIEEM (formerly known as IEEM), 2016. Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland; Terrestrial, Freshwater and Coastal, 2nd edition. Chartered Institute of Ecology and Environmental Management, Winchester

[3] SNH, 2013. A handbook on environmental impact assessment. Guidance for Competent Authorities, Consultees and others in involved in the Environmental Impact Assessment Process in Scotland. Natural Heritage Management. 4th Edition.

- ‘Existing infrastructure’ refers to all infrastructure relating to the existing Paul’s Hill Wind Farm;
- The ‘Paul’s Hill II Development Area’ refers to the red line boundary as shown on Figure 1.3 of the ES, which comprises a substation, seven turbines, external transformers, crane pads, foundations, site tracks, borrow pits and temporary construction and storage compound. The proposed wind farm development will use some of the existing access and site tracks;
- The ‘proposed Paul’s Hill II Wind Farm/ the proposed wind farm development’ refers to development and construction activities associated with the proposed Paul’s Hill II Wind Farm; and
- The ‘Study Area’ refers to the area for ecological assessment. Details for the habitat and each species specific Study Area can be found in Section 7.3 below.

7.3 METHODOLOGY

Consultation

7.3.1 As per SNH guidelines for EIA[3], a scoping document was issued to a range of consultees in May 2017. The scoping document intended to provide the competent authority and its advisors with sufficient information (where it existed at the time of scoping submission) on the likely impacts of the project on individual ecological features. The aim was to allow for an ES that focusses on only those features which could be significantly affected by the proposed wind farm, or for which the predicted effects are currently unknown. The scoping report therefore identified which ecological features could be scoped out of further assessment, and which should be taken forward to EcIA.

7.3.2 A scoping response was received from the Scottish Government Energy Consents Unit (ECU) on 24 July 2017. Details of the scoping responses which are of relevance to ecology are provided in Table 7.1 below.

Table 7.1: Details of scoping responses relating to ecological elements of the proposed wind farm development

Consultee	Date	Issues Raised and Consultee Recommendations	Scoping response addressed
Spey Fisheries Board (SFB)	12 Dec 2014	SFB recommended that a Fishery Management Plan be developed and submitted as part of the ES. In particular, the Allt a’Gheallaidh, which is part of the River Spey SAC, is included within the proposed wind farm development study area. SFB also stated that a robust assessment of the potential impact on SAC qualifying fish species such as Atlantic salmon (*Salmo salmar*) is required. SFB also stated that monitoring before, during and after construction should form part of the Fishery Management Plan. SFB also stated that climate change mitigation should be incorporated within the EIA, particularly with regard to reducing peak flows during heavy rainfall events. The assessment of peak flow mitigation should be on a landscape scale, rather than restricted to Sustainable Urban Drainage Systems (SUDS) intervention at the construction site, and SFB suggest that the creation of native woodland in the lower slopes of the site might also be considered.	Baseline surveys were undertaken in 2015, to form part of the Fishery Management Plan, and further surveys during the construction and post-construction period are proposed in Mitigation in Section 7.6. Assessment of potential impacts to fish species is included in Section 7.5. Mitigation related to climate change is included in Chapter 10: Hydrology, Geology and Hydrogeological Assessment.
SFB	23 June 2017	After consultation on the new layout and the scoping report, SFB confirmed they do not have any significant concerns regarding the proposals, stating “we have had a long history of association with the Paul’s Hill Wind Farm and so the developers have already been in touch with us directly. As a result, we are already engaging with them over the details and are expecting to undertake survey work on their behalf, should the scheme proceed.”	No further response required.
Scottish Government Energy Consents Unit (ECU)	24 July 2017	Special note should be taken of the protected areas and their respective requirements specifically referred to in the consultation responses from SNH, Forestry Commission Scotland (FCS) and Marine Scotland. This is also relevant to the Special Landscape Qualities of the Cairngorms National Park and to the Natural Heritage Zone referred to in RSPB Scotland consultation response of 06 July 2017.	See Habitat Regulations Appraisal in Section 7.11 regarding River Spey SAC. See scoping response for FCS below.
Forestry Commission Scotland (FCS)	12 June 2017	**Native woodland of UK Priority Habitat types** Native Pinewood and Upland Birch are present on the development site (Figure 1), some of which are located within the River Spey SAC. The Scottish Government’s Policy on Control of Woodland Removal, stipulates that there is a strong presumption in favour of protecting woodland resources and a strong presumption against removing this type of woodland. Scottish Government Policy on the Control of Woodland Removal (2009)[i] http://www.forestry.gov.uk/pdf/fcfc125.pdf/$FILE/fcfc125.pdf All effort should be made to prevent any loss of this nationally important resource and if development operations are to occur in, or close to the areas identified on Figure 1 (of the FCS scoping response) the guidance above should apply.	No substantive loss of Native Pinewood and Upland Birch in areas identified on Figure 1 (of the FCS scoping response). These areas are located at least 1700 m away from the nearest infrastructure Turbine 7 within the Paul’s Hill II Development Area.

Consultee	Date	Issues Raised and Consultee Recommendations	Scoping response addressed
Marine Scotland Science (MSS)	09 June 2017	The proposed development area is within the River Spey catchment, the latter is a SAC, with Atlantic salmon being a primary feature for this designation status. The developer is aware of the importance of salmon and trout populations in the catchment and has undertaken quantitative fish and invertebrate sampling of sites likely to be impacted and of control sites in 2015. This is good practice as we encourage up to date information to be used to inform the Environmental Impact Assessment, thereby enabling appropriate site specific mitigation measures to be drawn up and a robust integrated water quality and aquatic biota (macroinvertebrates and fish populations) monitoring to be established. Full details regarding mitigation measures and monitoring programmes should be outlined in the Ecology and Hydrology chapters of the Environmental Statement (ES). Further information regarding fisheries related issues and monitoring programmes can be found at the following web site: http://www.gov.scot/Topics/marine/Salmon-Trout-Coarse/Freshwater/Research/onshoreren. The potential impact of felling, if carried out, on the water quality and aquatic biota and the cumulative impact as a result of the present proposal and adjacent wind farms should be considered throughout the development. MSS note a decommissioning method statement will be prepared at least six months prior to decommissioning of the site. MSS recommends further surveys of watercourses within the development area to take place at least 12 months prior to the commencement of decommissioning.	See Mitigation in Section 7.6 and Habitat Regulations Appraisal in Section 7.11.
RSPB	06 July 2017	Turbine 1 is located within the Heather Management Area that was agreed as part of the Habitat Management Plan (HMP) required by a Section 75 agreement associated with the consent of the existing Paul's Hill Wind Farm. This agreement includes a range of mitigation measures to achieve the primary aim of conserving the local hen harrier population. It is important that the aims of the HMP are not compromised by the locations of the proposed turbines or any other aspect of the development. These matters should be discussed in the ES. The applicant should seek to minimise the carbon payback period associated with the development. Disruption to peat should be minimised through the EIA and design process (including by careful siting/'micrositing' of the turbines). We suggest that a suitable area of modified blanket bog should be identified and restored as compensation for the loss of functioning blanket bog. This area should be significantly larger than the area lost, in order to provide the same functional value as that being affected by the proposal. This is especially appropriate due to the uncertainty over impacts of disrupting the hydrological patterns of blanket bogs. Our experience of working on bog restoration shows that it is not possible to recreate this habitat from excavated, stored peat. The compensatory area should be assessed for suitability and agreed with the planning authority in consultation with SNH and RSPB. This matter should be discussed in the ES. The ES should include a clear description of the mitigation measures that are proposed to minimise potential adverse impacts, and a convincing assessment of residual impact following the deployment of these measures. There should be a commitment to post construction monitoring and to extend the life of the existing Habitat Management Plan to take into account the extended area and extended life of the wind farm. Evidence should be provided for the assumed effectiveness of proposed mitigation measures based on experience from other projects.	See Chapter 8: Ornithological Assessment which includes discussion of post construction monitoring and mitigation in Section 8.5, including the 'Habitat Management Plan'. See also, See Mitigation in Section 7.6 and Chapter 10: Hydrology, Geology and Hydrogeological Assessment.
SNH	05 July 2017	**River Spey SAC** The project is within the catchment of the River Spey and has connectivity to the River	See Mitigation in Section 7.6 and Chapter 10: Hydrology, Geology and Hydrogeological Assessment.

Consultee	Date	Issues Raised and Consultee Recommendations	Scoping response addressed
		Spey SAC. SNH confirmed that the application will therefore require a Habitats Regulations Appraisal (HRA), and noted that the implementation of the mitigation listed in Section 16.3.2 of the scoping report is essential for affording the SAC's interests protection during all phases of the project. They stated that this information should be expanded upon in the ES to provide a sufficient level of detail to inform the HRA and deliver a confidence that such measures can be securely implemented on site. It is likely, given the international importance of the SAC, that SNH will ask for the mitigation presented to be subject to planning condition(s). SNH provided answers to specific questions raised in the scoping report. These are as follows: **Approach to EIA.** *Question 2: Do consultees have any comments in relation to the approach to the Environmental Impact Assessment? We intend to focus the ES on the more significant effects and will therefore seek agreement that non-significant effects can be scoped out.* SNH noted that they have no comments in relation to the EIA approach. SNH are in principle supporting of the intention to focus on the more significant effects and are happy to confirm where they agree elements can be 'scoped out'. **Ecology.** *Question 17: Do consultees have any comments about the rationale provided for those ecological receptors proposed to be 'scoped out' of the ES?* SNH are happy for otter to be scoped out of the EcIA because we would expect the HRA for the River Spey to conclude no likely significant effect on otter. SNH agree with the approach to the other receptors including the use of 2014 data to inform the bat assessment.	See Habitat Regulations Appraisal in Section 7.11.
SNH	14 October 2017	SNH agree that the survey work proposed for the species/habitats is appropriate, and advise that other species should be included on the species survey list, namely migratory fish species.	Fish survey results are discussed in Section 7.4, assessment of impacts on fish species in 'Effects During Preparation and Construction – Species' in Section

Consultee	Date	Issues Raised and Consultee Recommendations	Scoping response addressed
		SNH advise that survey work for invasive non-native species (INNS) may be appropriate if there is the potential to either spread or positively manage for such species as a result of the proposal.	7.5. and mitigation measures in 'Mitigation Measures during Construction' in Section 7.6 Also see Habitat Regulations Appraisal in Section 7.11. Phase 1 Habitat and NVC survey results are discussed in Section 7.4 and no invasive non-native species were present within the Study Area.
SEPA	22 June 2017	SEPA advised to avoid delay and potential objection, the information outlined below must be submitted in support of the application: Map and assessment of impacts upon Groundwater Dependent Terrestrial Ecosystems (GWDTEs) and buffers based on an NVC survey and demonstrating that all GWDTE are outwith a 100 m radius of all excavations shallower than 1 m and outwith 250 m of all excavations deeper than 1 m and proposed groundwater abstractions. If micrositing is to be considered as a mitigation measure, the distance of survey needs to be extended by the proposed maximum extent of micrositing. The survey needs to extend beyond the site boundary where the distances require it. If the minimum buffers above cannot be achieved, a detailed site specific qualitative and/or quantitative risk assessment will be required. SEPA are likely to seek conditions securing appropriate mitigation for all GWDTE affected. Please refer to Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and GWDTEs Map and table detailing forest removal if appropriate.	NVC survey results are discussed in Section 7.4 and assessment of impacts on GWDTEs in 'Effects During Preparation and Construction – Habitats' in Section 7.5. Also see Chapter 10: Hydrology, Geology and Hydrogeological Assessment.

7.3.3 The 2017 scoping process was based on a combination of desk studies and surveys that commenced in March 2014. The survey work included surveys for protected mammals, specifically bats, otter (*Lutra lutra*), water vole (*Arvicola amphibious*), wildcat (*Felis silvestris*), badger (*Meles meles*) and pine marten (*Martes martes*) at the proposed Paul's Hill II Wind Farm development study area. The results indicated that there is little protected mammal activity within the Study Areas (see Technical Appendix 7.1).

7.3.4 As a consequence, all mammal species with the exception of bats were scoped out of the ES. Species-specific survey methods and results relating to mammal species other than bats will therefore not be included in the ES, and they will not be considered further. For further information, see the Paul's Hill Scoping Report which can be found in Technical Appendix 1.1 in Volume 4 of the ES.

Legislation, Policy and Guidance

7.3.5 The following framework of international and national legislation and planning policy guidance, which exists to protect habitats and specific species, has been considered as part of the assessment. Ecological baseline surveys have been conducted following recognised guidelines and the ecological impact assessment takes account of the Chartered Institute of Ecology and Environmental Management guidelines (the CIEEM Guidelines[2]):

Legislation

- Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the EC Habitats Directive);
- Environmental Impact Assessment Directive 85/337/EEC (the EIA Directive);
- The Conservation of Habitats and Species Regulations 2010 (the Habitats Regulations), which transposes the Habitats Directive into UK law;
- The Conservation (Natural Habitats, &c.) Amendment (Scotland) Regulations 2012;
- The Conservation of Habitats and Species (Amendment) Regulations 2017, relating to reserved matters in Scotland;
- Wildlife and Countryside Act 1981 (as amended), (referred to as (WCA));
- The Nature Conservation (Scotland) Act 2004;
- The Wildlife and Natural Environment (Scotland) Act 2011;
- Protection of Badgers Act 1992 (as amended);
- Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011, which transpose the EIA Directive into the Scottish planning system; and
- The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017.

National Policy Guidance

- Planning Advice Note (PAN) 1/2013 – Environmental Impact Assessment (Scottish Government 2013);
- PAN 51: Planning, Environmental Protection and Regulation (revised 2006);
- PAN 60: Planning for Natural Heritage (Scottish Government 2000);
- Nature Conservation: Implementation in Scotland of the Habitats and Birds Directives: Scottish Executive Circular 6/1995 as amended (June 2000);
- Planning Circular 3 2011; the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011; and
- Scottish Planning Policy.

Other Guidance

7.3.6 Particular attention has also been given to the guidance documents listed below, that are applicable to assessing the effects of wind farm developments on ecology. Reference has also been made to guidance documents through the report where relevant:

- European Protected Species, Development Sites and the Planning System: Interim guidance for local authorities on licensing arrangements[4];
- CIEEM Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal[2];
- Land Use Planning System SEPA Guidance Note 4: Planning Guidance on Wind Farm Developments[5];
- Good Practice during Wind Farm Construction[6];
- Handbook for Phase 1 Habitat survey: a technique for environmental audit[7];
- National Vegetation Classification Users' handbook[8];
- English Nature's Bat Mitigation Guidelines[9];
- Natural England's interim guidance on 'Bats and Onshore Wind Turbines' (Technical Information Note (TIN) 051)[10];
- Scottish Biodiversity List (SBL) [11, 12] (with habitat description from the UKBAP[13]); and
- North East Scotland Biodiversity Partnership – Action Plan 2014 – 2017[14].

Desk Study

7.3.7 A desk-based review has been undertaken to collate relevant public domain survey data and to obtain historical records of protected and relevant species from within the proposed Paul's Hill II development and surrounding environment. The purpose of the desk-based review was to help inform and guide the baseline ecological field surveys and to provide context to their results. Information obtained from the desk-based review, combined with the results of the ecological field surveys, has been used to further inform the likelihood of ecological features occurring at the site and/or being impacted by the development.

7.3.8 A search of online digital datasets available on the National Biodiversity Network (NBN) website[15] was conducted for protected species and habitats recorded within 5 km (10 km for bat species) of the proposed wind farm development within the last five years.

7.3.9 Data requests were submitted to North East Scotland Biological Records Centre (NESBReC); SNH; Spey Fishery Board (SFB); and Findhorn, Nairn and Lossie Fisheries Trust (FNLFT) to obtain records of protected species located within 5 km of Paul's Hill II Development Area. To ensure wider ranging bat species were fully considered

[4] Scottish Executive, 2001 (updated 2006). European protected species, development sites and the planning system: Interim guidance for local authorities on licensing arrangements. Scottish Executive, Edinburgh.

[5] SEPA, 2012. Land Use Planning System Guidance Note 4: Planning guidance on wind farm developments. Appendix 2. Version 7: 14 May 2014

[6] Scottish Renewables, SNH, SEPA, Forestry Commission Scotland, 2015. Good practice during wind farm construction. 3rd edition

[7] JNCC, 2010. Handbook for Phase 1 Habitat survey: a technique for environmental audit. JNCC, Peterborough

[8] Rodwell, J. S. 2006. National Vegetation Classification: Users' handbook. JNCC, Peterborough

[9] English Nature, 2004. Bat Mitigation Guidelines. English Nature

[10] Natural England, 2014. Technical Information Note TIN051 Bats and onshore wind turbines interim guidance, 3rd Edition

[11] The Scottish Government, 2013b. Scottish Biodiversity List. Available at: http://www.scotland.gov.uk/Topics/Environment/Wildlife-Habitats/16118/Biodiversitylist/SBL Accessed January 2015

[12] The SBL forms a list of species and habitats of importance for biodiversity conservation in Scotland, produced by the Scottish Government

[13] http://jncc.defra.gov.uk/page-5706 last accessed 18/11/2015

[14] North East Scotland Biodiversity Partnership, 2014. Action Plan 2014 – 2017. Available at: http://www.nesbiodiversity.org.uk/publications

[15] https://data.nbn.org.uk/imt/#4-10.534,54.605,3.528,58.195 last accessed 13/03/2017

(e.g. Leisler's bat (*Nyctalus leisleri*), common noctule (*Nyctalus noctula*), Nathusius's pipistrelle (*Pipistrellus nathusii*)), records of bats occurring within 10 km were requested.

7.3.10 A search of the SNH online tool Sitelink[16] and the online GIS tool Magic[17] was used to identify and provide information on protected areas designated at a local, national or international level for ecological interests located within 10 km of the proposed Paul's Hill II development (excepting areas designated solely for ornithological interests: these are discussed in Chapter 8: Ornithology Assessment). Designated sites identified in the data search included Special Areas of Conservation (SAC), Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR) and Local Nature Reserves (LNR).

7.3.11 Paul's Hill II Wind Farm will be an extension to the operational Paul's Hill Wind Farm, which has been undergoing operational-phase monitoring since 2006, as well as baseline, pre-construction and construction phase monitoring from 2000 until 2005. In addition, an Environmental Assessment (EA) was carried out across all the land within the ownership boundary in 2015, on behalf of the landowner, The Ballindalloch Trust, to provide data required by the Scottish Government's 'Basic Payment Scheme' (BPS). Therefore, the features of importance within the Paul's Hill II Development Area and surrounding environment are already well known. This information has also been used to inform our assessment as to the importance of the proposed wind farm development to ecological features and, where relevant, this contextual information is discussed in the assessment of impacts.

Field Survey

7.3.12 Full details of all ecology field survey timings and detailed methodologies are provided in Technical Appendices 7.1 to 7.3. A brief description/overview of each survey method type is provided below.

7.3.13 All relevant study areas are shown in Figures 7.1 – 7.6.

Phase 1 Habitat Survey

7.3.14 A Phase 1 Habitat Survey was carried out in July 2014, following the standard habitat survey method as described in the Joint Nature Conservation Committee's (JNCC) Handbook for Phase 1 Habitat Survey[7]. The survey area comprised all land within a minimum buffer of 250 m of turbine locations as specified at the time of survey.

7.3.15 Since 2014 the turbine layout has changed. An additional Phase 1 habitat survey was conducted during August and September 2017 to ensure all habitats within 300 m of the new turbine locations had been included in the survey (see Figure 7.1).

7.3.16 Descriptions of habitat types were provided and target notes were taken to record additional details of vegetation and habitats and features of ecological interest where present. For further details of the field survey methods employed, see Technical Appendix 7.1.

National Vegetation Classification (NVC) Survey

7.3.17 NVC surveys were carried out over the same survey periods as the Phase 1 Habitat surveys in July 2014 and August and September 2017. The survey area comprised all land within a minimum buffer of 300 m of original and modified turbine locations (see Figure 7.1). This followed the standard NVC method, as described in the National Vegetation Classification: Users' Handbook[8]. NVC community and sub-community types were identified in the field, and delineated and mapped using Global Positioning System (GPS) as per Chapter 10 of the NVC Users' Handbook. Where areas were considered to comprise mosaics or complexes of different habitat communities, the proportion of each was estimated in percentage terms. Target notes were recorded to provide an overview of the habitat types present and any features of ecological interest. Grid references and photographs were taken to visually catalogue the location, and a species list recorded. For further details of the field survey methods employed, see Technical Appendix 7.1.

[16] https://gateway.snh.gov.uk/sitelink/ last accessed 21/02/2017

[17] http://www.magic.gov.uk/ last accessed 10/03/2017

Fish and Macro-invertebrate Survey

7.3.18 The Allt a' Gheallaidh, which borders the Paul's Hill II ownership boundary to the south, forms part of the River Spey SAC. Due to the connectivity of this watercourse to the Paul's Hill II Development Area, baseline electrofishing, macroinvertebrate and water quality surveys were undertaken in 2015 by The Spey Foundation and Aquaterra in the Allt a' Gheallaidh, and in control sites in the nearby Tulchan Burn which is outside the influence of the proposed wind farm development.

Macro-invertebrate and water quality surveys

7.3.19 To assess the invertebrate communities and the water quality of watercourses with hydrological connectivity to the proposed wind farm development, macroinvertebrate communities were sampled on the 23-24th September 2015 using standard kick sampling methods[18] from six sites on the Allt a' Gheallaidh (see Figure 7.3), and two control sites on the Tulchan Burn.

7.3.20 Aquatic invertebrate species can be used as biological indicators to broadly assess both the general quality of freshwater and to assess more specific chemical status such as acidity. Major macro-inverterbrate groups (*Malacostraca, Ephemeroptera, Trichoptera, Plecoptera, Mollusca, Odonata* and adult *Coleoptera*) were identified to species level to establish presence of any rare species and to provide data for production of biological indices including:

- Biological Monitoring Working Party (BMWP);
- Average Score Per Taxon (ASPT);
- Water Chemistry Class;
- Index of Acidity;
- Water Framework Directive (WFD) ecological status class for ASPT; and
- Number of taxa (NTAXA) parameters.

7.3.21 Physical environmental variables including bed width, depth, flow and substrate profile were recorded at each site. Full survey methods are provided in the Technical Appendix 7.3.

Fish Survey

7.3.22 Electrofishing is a widely used technique to assess freshwater fish populations. Survey work was undertaken over five days from 12th August to 9th September 2015 inclusive, using a three-run fully quantitative protocol.

7.3.23 The same sites were used as were monitored during the development and construction period of Paul's Hill Wind Farm. Full survey methods are provided in the Technical Appendix 7.3.

7.3.24 As the Allt a'Gheallaidh is the primary watercourse draining the proposed Pauls Hill II Wind Farm development, six sites were surveyed in that catchment along with two control sites in the adjacent Tulchan Burn, a burn with similar water chemistry and fish accessibility. One of the Allt a'Gheallaidh survey sites was located in its tributary, the Allt a'Mhonaidh. Details of the sites surveyed are provided in Table 7.2 below.

Table 7.2: Electrofishing site details Allt a'Gheallaidh and Tulchan Burn

Watercourse	Site Code	Easting	Northing	Site Location	Area Surveyed (m2)	Average Width (m)	Conductivity Microseimens/cm
Allt a'Gheallaidh	SLB18a	317514	837732	Between road and Speyside Way	131.3	6.6	39

[18] United Kingdom Advisory Group (UKTAG) 2008. UKTAG River Assessment Methods Benthic Invertebrate Fauna. River Invertebrate Classification Tool (RICT).

Watercourse	Site Code	Easting	Northing	Site Location	Area Surveyed (m2)	Average Width (m)	Conductivity Microseimens/cm
	SLB18c	315900	838400	Croftintaggart	125.0	5.5	42
	SLB18d	312596	838600	100 m below Altvounnie	138.6	4.62	43.6
	SLB18f	311100	840200	Below eroding bank	84.4	3.08	34
	SLB18g	310868	840405	150 m upstream of confluence with Allt na Bealaidh	74.4	3.17	37
Allt a'Mhonaidh	SLB18e	312503	838763	150 m upstream confluence with Allt a'Gheallaidh	74.1	1.65	54.3
Tulchan Burn	SMB2a	311900	836250	Above Old Mill	58.6	3.66	44
	SMB2b	309500	837300	Above third ford	76.8	3.84	35.7

Source: Spey Foundation, 2015

7.3.25 Salmonid fish densities were separated into fry and parr for the presentation of results. Fry, or 0+, refers to fish less than one year old resulting from spawning at the end of the previous year and parr, or 1++, to older fish. Other fish species captured were identified and recorded by length where possible. A range of habitat variables for each site were recorded. Site photographs were taken at each site.

7.3.26 Fish density results are classified according to the Scottish Fisheries Coordination Centre (SFCC) Scottish national classification scheme and are expressed as being absent, very low, low, moderate, good or excellent (see Appendix 7.3).

7.3.27 It should be noted that the Spey catchment is highly variable and migratory fish, such as salmon, are able to access a wide range of habitat types. It should be borne in mind that some rivers/burns will only naturally support low numbers of fish even if the habitat is pristine, depending on overall productivity levels. For example, high altitude burns draining granite geology are streams that are naturally low in productivity. Many of the smaller burns in particular are inaccessible to migratory salmonids due to the presence of natural waterfalls or occasionally man made obstructions such as weirs.

Survey Limitations

- Electrofishing is a common means of obtaining data on juvenile salmonid populations. However, it is only effective in shallow streams;
- The survey sites chosen were selected to be representative of the general habitat type present within each sub-catchment and to include a range of flow and substrate types. The SFCC protocol recommends that the minimum survey length is six times the mean channel width at the site, with a minimum of 20 m length (SFCC 2007). If the site selected is representative of the local habitat the survey should provide a robust estimate of local fish populations. However, it is possible that if fish populations are low or have a clumped distribution, the data from an electrofishing site may not adequately sample the full range of fish species present in that area; and
- It is impossible to prove the absence of fish by electrofishing; therefore, whilst the failure to capture fish at a site may indicate that the population is low, it cannot be assumed that fish are necessarily absent.

Bat Survey

7.3.28 Bat surveys were undertaken by FDM Ecology Limited (FDM) seasonally between May and September 2014 and methods were based on standard methods for surveying bat species as described by Hundt (2012)[19] and Walsh, *et al*. (2012)[20]. Bat roost suitability assessment, fixed position static detector surveys, and transect surveys were conducted at specific locations identified within proximity to the Paul's Hill II infrastructure layout which was current at the time of survey. Bat transect route and static activity survey locations are shown in Figure 7.2.

Transect bat activity survey

7.3.29 Transect surveys consisted of one transect route approximately 11.5 km in length through proposed turbine locations along existing wind farm tracks and the public road (see Figure 7.2). Transect surveys were undertaken on three occasions during 2014 in each active season, once each in May (spring), July (summer) and September (autumn). The route used was part walked (5 km) and part driven (6.5 km), and covered open moorland to the west of the existing wind farm and along existing wind farm tracks.

Static bat activity survey

7.3.30 Fixed position static detector surveys were carried out in 2014 on three occasions during each active season, once in May (spring), July (summer) and September (autumn). A total of six Anabat SD2 bat detectors were deployed at sample locations within the site (see Figure 7.2) for five consecutive nights per survey period. Five were deployed in typical habitat present within the proposed turbine areas (Sample Locations 1 - 5), and one was deployed in a reference location selected to represent the nearest 'higher quality' bat foraging habitat (Reference Sample Location 6).

Bat roost assessment

7.3.31 Bat roost suitability assessment was undertaken on 24th July 2014 to identify the presence of potential bat roost habitat as well as any areas likely to provide key foraging or commuting habitat. It consisted of a ground based assessment of Paul's Hill II Development Area including a survey of trees within 200 m of the original turbine locations.

Survey Limitations

- All surveys were conducted from ground level;
- It is not always possible to identify a bat call to species level, especially for *Myotis* species, or if the call is not clear. Files may contain only fragments of a call, or else the bat may be calling from a distance from the detector in which case it may not be complete enough to assign to a specific species;
- Some caution must be taken when comparing activity levels between species, as bias can be shown towards those species with 'louder' or 'lower frequency' echolocation calls. Although this bias needs to be considered, it is unlikely to have had any significant bearing on the overall results and assessment;
- A bat contact is defined as a single 15 second Anabat file which contains at least one bat call. Multiple contacts at any given detector location do not necessarily indicate the presence of more than one bat and should therefore only be interpreted as a level of activity at a location;
- Due to equipment malfunction or failure, one detector failed to collect data during July and one during September (locations 6 and 3 respectively). The reduced volume of data collected is not considered to significantly affect the overall conclusions in this instance;
- The turbine layout has changed since 2014, resulting in part of the Bat Study Area being outwith the turbine area. However, habitats surveyed at transect and static detector locations are comparable to unsurveyed

[19] Hundt, L. 2012. Bat Surveys: Good Practice Guidelines, 2nd edition. Bat Conservation Trust, London

[20] Walsh, K., Matthews, J. and Raynor, R, 2012. Bats and Wind Turbines Version 2 – June 2012. Natural England, SNH and Countryside Council for Wales

areas within the turbine areas. Therefore changes to the layout are not considered to be a significant limitation as the survey still sampled a representative range of habitat types across the Paul's Hill II Development Area; and

- In the absence of any recognised criteria to define levels of bat activity (e.g. what constitutes low, medium or high activity) professional judgement has been used, taking into consideration geographical location and experience gained through conducting similar surveys at other sites throughout Scotland.

Impact Assessment

7.3.32 This section summarises how the significance of effects on the non-avian ecological features of interest at the proposed Paul's Hill II Wind Farm was assessed.

7.3.33 The approach used for the assessment of ecological impacts followed the guidance produced by CIEEM[2]. These guidelines set out the process for assessment through the following stages:

- Describing the baseline ecological conditions in the zone of influence through survey and desk study;
- Identifying important ecological features (IEFs) that may be affected within the zone of influence of the proposed wind farm development;
- Identifying and characterising the potential impacts based on the nature of the construction, operation and decommissioning activities associated with the proposed wind farm development;
- Determining the significance of the ecological impacts based on the interaction between the sensitivity of the ecological feature, and the extent, magnitude, duration, timing, frequency and reversibility of the effect and the likelihood of the effect occurring;
- Determining the level of confidence in the above impact predictions;
- Identifying mitigation measures required to address significant adverse/ negative effects;
- Determining the residual impact significance after the effects of mitigation have been considered, including a description of any legal and policy consequences; and
- Identification of any monitoring requirements.

Determining Important Ecological Features

7.3.34 The assessment process involves identifying important ecological features (IEF). In accordance with CIEEM[2] guidelines, the importance of an ecological feature is based upon its respective elements relating to biodiversity and ecosystem services. Separate consideration should be given to the legal protection offered to an ecological feature along with additional policy implications. Their importance should also be considered within a defined geographical context as given in Table 7.3. It is recommended that the criteria in Table 7.3 are used but adapted to suit local conditions. It should be noted that these criteria are intended as a guide and are not definitive.

7.3.35 Evaluating the importance of an ecological feature is generally straightforward in the case of designated sites, as the designations themselves are normally indicative of a value level. For example, a SAC designated under the Habitats Directive is explicitly of European (International) importance. Where a site is afforded more than one designation, it is the one of higher level (within the geographic frame of reference) which is considered of overriding importance. For non-designated features, the use of guidelines such as the national guidelines for the selection of SSSIs can be helpful in attributing importance to an ecological feature. Ecological features of interest should be valued accordingly, with ecological features unrelated to the site designation assessed and evaluated according to their intrinsic importance.

7.3.36 It should be noted that some ecological features, including certain legally protected species such as otter, may be of insufficient ecological value to warrant consideration within the ecological impact assessment, but are instead considered in the context of legal and policy implications.

7.3.37 Socioeconomic, cultural, and secondary/supporting values may be considered, where appropriate, but do not otherwise form a key part of this assessment.

Table 7.3: Approach to evaluating importance of ecological features by a defined geographical context

Levels of Importance	Example of IEF
International	An internationally designated site such as a SAC, or site meeting criteria for international designations. Species populations/habitat areas present with sufficient conservation importance to meet criteria for SAC selection. A regularly occurring, nationally important population of any internationally important species listed under Annex II, IV and V of the Habitats Directive.
National	A nationally designated site (SSSI, NNR), or sites meeting the criteria for national designation (such as the JNCC guidelines). Species populations/habitat areas present with sufficient conservation importance to meet criteria for SSSI selection. A regularly occurring, regionally important population of any nationally important species listed as an SBL priority species.
Regional	Species populations/habitat areas present falling short of SSSI selection criteria but with sufficient conservation importance to likely meet criteria for selection as a local site (e.g. important in the context of SNH Natural Heritage Zone populations/habitat extents). Sites designated as LNR such as Scottish Wildlife Trust (SWT) Reserves or Local Biodiversity Sites (LBS).
Local	Areas of semi-natural ancient woodland smaller than 0.25 ha. Areas of habitat or species populations considered to appreciably enrich the ecological resource with the local context, e.g. species-rich flushes or hedgerows or evidence of regular otter activity.
Negligible	Usually widespread and common habitats and species. Ecological features falling below Local importance are not normally considered in detail in the assessment process.

7.3.38 The assessment of ecological features recorded during the baseline surveys also considers the value of the Paul's Hill II Development Area for the habitat or species under consideration, rather than only considering the nature conservation importance of the habitat or species itself.

7.3.39 Therefore, while the importance of the species is taken into account, in order to assess the nature conservation importance of the site, the number of individuals of that species using it and the nature and level of this use are also taken into account. An assessment is then made of the importance of the Paul's Hill II Development Area to the species in question.

7.3.40 Attributing the importance to an ecological feature involves defining the population/habitat network, with application of professional judgment to identify an ecologically coherent population/habitat network against which effects on integrity can be assessed (refer to the 'Determining Significance of Potential Ecological Effects' section below). For example, for wide-ranging species such as otter utilising freshwater habitats, it may be appropriate to value the otter population at a catchment level; whereas for more localised species such as water vole, importance may be attributed to individual groups of related colonies occupying an individual watercourse, functioning as a larger meta-population. In accordance with CIEEM[2] guidelines when valuing ecological features, professional judgement must be made on the basis of an objective assessment of the best information available: in circumstances of reasonable doubt, a precautionary approach has been adopted.

Characterising Potential Effects on Ecological Features

7.3.41 The process of identifying ecological effects and impacts should make reference to aspects of the ecological structure and function upon which the ecological receptor depends. Impacts must be assessed within the context of the predicted baseline conditions occurring in the Zone of Influence (i.e. the area directly or indirectly affected by the proposed wind farm development), within the lifetime of the proposed wind farm development[2]. To ensure cumulative impacts are fully addressed, environmental trends such as climate change should be taken into account when considering the predicted baseline for IEFs. When characterising effects and predicting impacts to ecological receptors, the following ecological aspects relating to receptor structure and function are considered:

- Available resources: food, territory, nutrients, soil minerals etc.;
- Stochastic processes: extreme weather events, disease, geomorphic processes, climate change etc.;
- Ecological processes: population dynamics (competition, dispersal etc); vegetation dynamics (colonisation, succession etc.);
- Ecological relationships: food webs, predator-prey relationships, adaptation, dynamism etc.;
- Ecological role of function: decomposer, herbivore, parasite, predator, keystone species etc.;
- Ecosystem properties: connectivity, carrying capacity, population numbers, fragmentation etc.;
- Anthropogenic influences: environmental management, land use; and
- Historical context: natural range of variation over a historical period, irregular perturbations beyond normal range.

7.3.42 When characterising ecological impacts, it is essential to consider the likelihood that a change/activity will occur as predicted, with a degree of confidence in the impact assessment (in relation to the impact on ecological structure and function). Where possible, the degree of confidence should be predicted quantitatively. Where this is not possible, a more qualitative approach is taken; particularly where the confidence level can only be based on expert judgement. Within this EcIA, the confidence in the assessment when predicting impacts to ecological receptors are as follows;

- Certain/near certain: probability estimated at 95% chance or higher;
- Probable: probability estimated above 50% but below 95%;
- Unlikely: probability estimated at above 5% but less than 50%; and
- Extremely unlikely: probability estimated at less than 5%.

7.3.43 In addition to predicting the degree of confidence quantitatively, magnitude (the size or amount of an impact) should also be determined on a quantitative basis. Magnitude can be negative or beneficial, with the magnitude of impact varying from very highly negative to beneficial. High – very high negative magnitude impacts include large-scale permanent and / or high probability changes, affecting an ecological receptor's population or extent (Table 7.4). Minor negative impacts will typically be small in scale and/or temporary in effect (Table 7.4. This impact assessment takes into account whether an impact is beneficial or negative, short-term (for example only during construction) or long-term (throughout the lifetime of the proposed development), reversible or permanent. The criteria used in the EcIA for describing the overall magnitude of a potential impact are summarised in Table 7.4 below.

Table 7.4: Criteria used to determine the magnitude of ecological impacts

Effect magnitude	Definition
Very high negative	Total or almost complete loss of a feature resulting in a permanent negative effect on the integrity of the ecological feature. The conservation status of the feature will be permanently affected.
High negative	Result in large-scale, permanent changes in an ecological feature, and likely to change its ecological integrity. These effects are therefore likely to result in overall changes in the conservation status of an ecological feature.
Moderate negative	Include moderate-scale long-term changes in a feature, or larger-scale temporary changes, but the integrity of the ecological feature is not likely to be affected. This may mean that there are temporary changes in the conservation status of the ecological feature, but these are reversible and unlikely to be permanent.
Minor negative	Include effects that are small in magnitude, have small- scale temporary changes, and where integrity of the ecological feature is not affected. These effects are unlikely to result in overall changes in the conservation status of an ecological feature.
Negligible	No perceptible change in the ecological feature.
Beneficial	The changes in the ecological feature are considered to be beneficial to its ecological integrity or nature conservation value.

Determining Significance of Ecological Effects

7.3.44 Having followed the process of assessing an ecological feature and characterising potential effects, the significance of the effect is then determined. In accordance with the CIEEM[2] guidelines, within this assessment an ecologically significant impact is defined as an impact (beneficial or negative) on the integrity of a defined site or ecosystem, and / or the conservation status of habitats or species within a defined geographical area. The importance of an IEF is related directly to the impact consequences in terms of legislation, policy or development control at the appropriate level and is used to identify the geographical scale at which the impact is significant. It is acknowledged that if an impact is found to be not significant at the level it was valued (e.g. nationally), it potentially may be more significant at a local level.

7.3.45 The mitigation hierarchy should be applied to significant impacts on IEFs, in line with guidance derived from policies relevant to the geographic scale of the IEF importance (as per policies outlined above). Any remaining significant impacts following the application of mitigation (i.e. residual impacts), together with an assessment of the likelihood of mitigation success, should be considered against relevant legislation, policy and development control.

7.3.46 To test whether or not an impact will affect the integrity of a site or an ecosystem (and is therefore significant), it is necessary to understand if changes / activities arising from the proposed wind farm development are likely to move the baseline conditions for the ecological feature closer to or further away from a favourable condition and the ecological status that constitutes 'integrity' for that system.

7.3.47 The term integrity is used within this EcIA in accordance with the definition adopted by the Office of the Deputy Prime Minister (ODPM) Circular 06 / 2005 on Biodiversity and Geological Conservation, supported by the Scottish Executive Circular June 2000 (Habitats and Birds Directives Nature Conservation), as follows:

7.3.48 "*The integrity of a site is the coherence of its ecological structure and function across its whole area, that enables it to sustain the habitat, complex of habitats and / or the levels of populations of species for which it was classified*."

7.3.49 A site or ecosystem that achieves this level of ecological coherence is considered to be of favourable condition. Within this EcIA, integrity therefore refers to the maintenance of the conservation status of a habitat or population of a species, at a specific location or geographical scale. In accordance with CIEEM[2] guidelines, the various components of ecological integrity (of an ecosystem or site) may include the following:

- An assemblage of different ecosystem processes, including anthropogenic influences;
- Dynamics of the ecosystem at several scales; and

- Levels of habitats or population where the desired condition is the average level that would be considered "*acceptably characteristic of the site or ecosystem*".

7.3.50 When assessing potential impacts on the conservation status of an ecological feature (such as a site with a national or international designation), integrity should be considered in line with published citations and conservation strategies specific to the feature. Where reasonable doubt may exist in determining impacts on integrity, a precautionary approach should always be taken and a negative effect on integrity predicted.

7.3.51 In line with the CIEEM[2] guidelines, conservation status is used within this assessment to determine whether an impact on a habitat or species is ecologically significant. Conservation status is evaluated in terms of the geographical scale for each ecological feature, as outlined above in Table 7.4. Assessment of the potential for effects and impacts to the conservation status of an ecological feature is assessed using the same reasoning as applied to the integrity of an ecological feature (outlined above), along with an estimation of ecological resilience.

7.3.52 Once the importance has been attributed to an ecological feature and the potential impacts of the proposed wind farm development characterised, the significance of the ecological impact can be ascertained. In accordance with the CIEEM[2] guidelines two categories are used to classify impacts: "significant" or "not significant". Within this EcIA, an impact that threatens the integrity of an ecological feature is considered to be significant in terms of the EIA Regulations.

7.3.53 Significance in the context of the EIA Regulations is used here to describe the relative importance of impacts on any feature of ecological importance. In this assessment, an ecologically significant impact has a negative or beneficial effect on the integrity of a site or ecosystem and / or the conservation objectives for habitats or species within a given geographical area. The legal protection of species is considered separately.

7.3.54 Where potential impacts of the proposed wind farm development are assessed as significant, mitigation measures are required in accordance with the relevant guidance (as referred to in Section 7.6), appropriate to the scale and importance of the ecological feature. Where negative impacts considered not significant are identified, mitigation should also be applied as good practice and may still be a legal requirement. Following identification of mitigation requirements, consideration of residual impacts is undertaken, with identification of further mitigation, ecological monitoring or management requirements as deemed necessary.

7.3.55 In accordance with CIEEM[2] guidelines, a matrix system has not been employed for the determination of impact significance, as this method often places negative impacts to IEFs of local importance into a 'low significance' category, misleadingly downplaying local values of biodiversity. As part of the assessment process the importance and magnitude of each ecological feature is considered, in addition to the likelihood, permanency, frequency and longevity of a potential impact. It is therefore considered preferable to address each ecological impact qualitatively, ensuring inclusion of the aforementioned factors in the assessment process.

7.4 RESULTS

Desk Study

7.4.1 This section presents a summary of existing and incidental records for the vicinity of Paul's Hill II from the data received from NESBReC, SNH, FNLFT and SFB, as well as from searches of the NBN gateway[21]. In addition, data collected during long-term monitoring at the adjacent existing Paul's Hill Wind Farm, and for the Basic Payment Scheme Environmental Assessment (BPS EA) for Ballindalloch Trust in 2015 has contributed to our understanding of the ecological features present at the proposed development. These records are summarised below.

7.4.2 FNLFT did not have any data they were able to provide.

7.4.3 There is one site of ecological importance within 5 km of Paul's Hill II, with two statutory designations -- River Spey SAC and SSSI. This site is designated for otter (*Lutra lutra*), freshwater pearl mussel (*Margaritifera margaritifera*), sea lamprey (*Petromyzon marinus*) and Atlantic salmon.

7.4.4 Within 10 km, there are a further three designated sites of ecological importance: Moidach More SAC and SSSI, Lower Strathavon Woodlands SSSI and Burn of Ballintomb SSSI. These sites are designated solely for habitat features and have no direct hydrological connectivity, and are too distant from the Paul's Hill II site (>5 km) for other effect pathways. As such there will be no effects on the sites within 5-10 km of the proposed wind farm development, and they will therefore not be considered further

Data relating to fish

7.4.5 Historic electrofishing survey results from 2010 until 2014 were provided by SFB for watercourses within a 5 km radius of proposed Paul's Hill II development's ownership boundary, including tributaries of the Spey with connectivity to the site are shown in Table 7.5 below. These data show the presence of salmonids in all of the watercourses surveyed, and in the Allt a' Gheallaidh the distribution of salmon in 2014 was restricted to the two lower sites with none present in the upper sites.

7.4.6 The densities of trout fry were predominantly in the good or excellent categories at all three sites of the Allt a'Gheallaidh in 2014, indicating the importance of this tributary as a spawning burn for trout.

Table 7.5: Historic electrofishing survey results from 2010 until 2014 for watercourses within a 5 km radius of the ownership boundary. Watercourses and electrofishing sites in bold are assessed in the 2015 Spey Foundation electrofishing report in Technical Appendix 7.3

		Location			Density per 100m2				
Watercourse	Site code	Easting	North-ing	Date	Salmon 0+	Salmon 1++	Trout 0+	Trout 1++	Other fish species
Ballintomb Burn	SLB12b	320650	842400	27/07/2010	0.0	1.2	1.2	7.2	None
				08/07/2011	0.0	7.1	12.1	14.2	Eel
				07/08/2014	0.0	12.3	6.1	28.2	Eel
Knockando Burn	SLB14d	318948	841716	08/10/2012	38.2	14.7	10.4	3.5	Eel
				08/07/2013	31.4	19.0	31.4	5.7	Eel
	SLB14c	318445	843181	09/08/2012	0.0	1.3	3.8	8.9	None
				08/07/2013	0.0	9.1	14.2	15.2	None
Allt Arder	SLB15a	318200	841350	06/07/2012	14.5	19.4	8.9	8.9	None
	SLB15b	317221	841585	10/05/2011	0.0	0.8	0.0	10.0	None
				30/08/2012	0.0	1.9	8.6	10.5	None
				09/07/2013	0.0	5.3	1.5	9.8	None
				10/07/2014	0.0	0.0	15.3	10.7	None
Allt a'Gheallaidh	**SLB18a**	317514	837732	26/09/2011	7.5	15.7	4.5	1.5	None
				07/08/2014	67.2	13.0	10.7	9.9	Eel
	SLB18c	315900	838400	22/09/2014	3.0	11.8	16.2	5.9	None
	SLB18d	312596	838600	22/09/2014	0.0	0.0	16.2	11.3	None
Tulchan Burn	**SMB2a**	311900	836250	20/06/2010	30.6	18.4	37.8	5.1	None

[21] https://data.nbn.org.uk/imt/#4-10.534,54.605,3.528,58.195 last accessed 13/03/2017

Watercourse	Site code	Location Easting	Location North-ing	Date	Density per 100m2 Salmon 0+	Salmon 1++	Trout 0+	Trout 1++	Other fish species
				05/10/2011	43.2	27.3	31.0	3.8	None
				06/09/2013	24.0	17.7	21.5	17.7	None
				25/09/2014	23.2	10.3	9.0	2.6	None
	SMB2b	309500	837300	05/10/2011	10.8	1.2	13.2	3.6	None
				06/09/2013	1.6	13.2	39.7	36.4	None
				25/09/2014	29.8	10.8	36.6	23.0	None
Tommore Burn	SA1d	319057	834993	14/08/2013	16.6	6.4	27.6	6.4	Eel
River Spey	S3	318267	838614	01/10/2014	97.7	33.3	2.3	1.1	Eel, Minnow

Source: SFB

7.4.7 The results of the 2015 electrofishing survey discussed below in Section 7.4 have been compared with the above historic data as well as historic data collected from 2002 to 2007 inclusive at the same eight survey sites as the 2015 survey. Some of these surveys were carried out as part of pre-construction and construction surveys at the existing Paul's Hill Wind Farm.

Data relating to bats

7.4.8 The NBN Gateway, SNH and NESBReC were consulted for bat records, up to 10km from the site. Results are summarised in Table 7.6. Note that all these records are over 10 years old.

Table 7.6: Desk Base Records Summary

Species	Source	Notes
Soprano pipistrelle *Pipistrellus pygmaeus*	SNH	Two records dating from 2006
Common pipistrelle *Pipistrellus pipistrellus*	SNH	Two records dating between 2004 - 2006
Daubenton's bat *Myotis daubentonii*	SNH	Record dating from 1986
Natterer's bat *Myotis nattereri*	NESBReC	1980 - 1994
Brown long-eared bat *Plecotus auritus*	SNH and NESBReC	Seven records between 1980 and 2004

Field Surveys

7.4.9 A summary of the results of each survey is provided below; full results of all ecology surveys are provided in Technical Appendix 7.1.

Phase 1 Habitat Survey

7.4.10 The majority of the Paul's Hill Development Area consists of open habitat, comprising a mosaic of mire and heathland habitats, including blanket bog. There are also areas of bracken and acid/neutral flush along the course of the burns. The land is managed for sporting purposes (grouse shooting), and there is a history of muirburn and some limited land drainage across the area. The site is also drained by several burns, including tributaries of the Allt a' Gheallaidh to the west and south, which is part of the River Spey SAC.

7.4.11 The land covering Roy's Hill and Lady's Hill, immediately to the south and east of the updated proposed turbine layout, is designated as a Heather Management Area (HMA), which is managed for the conservation of hen harrier under the terms of a Moorland Management Plan (MMP), which was a requirement of the Section 75 agreement for the existing Paul's Hill Wind Farm.

7.4.12 All habitats recorded during the Phase 1 habitat survey are shown in Figure 7.4. Full species lists, target notes and photographs are provided in Technical Appendix 7.1. Plant species taxonomy used in this chapter and Technical Appendix 7.1 follows Stace (2010)[22] for higher plants, Atherton *et al*. (2010)[23] for bryophytes and for lichens Dobson (2011)[24].

7.4.13 Eleven different habitat types were recorded. The survey area is predominantly comprised of blanket bog, although to the west of Roy's Hill, it is primarily dry modified bog. There were patches of acid dry dwarf shrub heath throughout the survey area and small areas of wet dwarf shrub heath and acid flush. All habitats identified within the survey area are listed in Table 7.7 below, along with their national and/or international conservation importance. A brief summary of each of the Phase 1 habitat types recorded within the Study Area is provided below.

Table 7.7: Phase 1 habitat types identified within the study area of the proposed wind farm development on the turbine layout current at the time of the 2017 survey.

Phase 1 habitat code	Phase 1 Habitat	International & national conservation importance
A1.2.1	Semi-natural coniferous woodland	Annex 1, SBL
A3.2	Scattered trees - coniferous	None
C1.1	Bracken – continuous	None
D1.1	Dry dwarf shrub heath – acid	Annex I; SBL
D2	Wet dwarf shrub heath	Annex I; SBL
D3	Lichen/bryophyte heath	Annex I; SBL
E1.6.1	Blanket bog	Annex I25; SBL
E1.8	Dry modified bog	Annex I26
E2.1	Flush and spring – acid/neutral	SBL
G1.3	Standing water - oligotrophic	SBL

[22] Stace, C. A. (2010). *New Flora of the British Isles*. Third Edition. Cambridge University Press, Cambridge.

[23] Atherton, I., Bosanquet, S. & Lawley, M. [eds.] (2010). Mosses and Liverworts of Britain and Ireland: A field guide. British Bryological Society, Plymouth.

[24] Dobson, F. S. (2011) Lichens: an illustrated guide to the British and Irish species (6th edition) Richmond Publishing, Slough.

[25] Active blanket bog is an Annex I priority habitat

[26] Although modified bog is not an Annex I priority habitat, it is included in the EC Habitats Directive due to its potential for natural regeneration

Phase 1 habitat code	Phase 1 Habitat	International & national conservation importance
G2.3	Running Water -oligotrophic	SBL

7.4.14 A description of each Phase 1 habitat type recorded within the survey area is presented in Technical Appendix 7.1.

National Vegetation Classification (NVC) Survey

7.4.15 Habitats have been classified using the National Vegetation Classification (NVC), to community or sub-community level, following Rodwell (1991[27], 1992[28].) and Averis *et al.* (2004)[29]. A total of 17 NVC sub-communities were identified during the survey, including:

- One woodland community with one sub-community identified;
- Five dry heathland communities, all identified to sub-community;
- One wet heathland community, with two sub-communities identified;
- Three bog pool and blanket bog communities, with five sub-communities identified;
- One upland flush community, identified to sub-community; and
- Two upland grassland communities, both identified to sub-communities.

7.4.16 NVC communities identified within the Study Area have been mapped and are presented in Figure 7.5. Table 7.8 summarises the habitat types recorded at the Study Area, and provides a summary of each habitat type's European and UK legislative and conservation status. Table 7.8 also shows the potential extent of Ground Water Dependent Terrestrial Ecosystems (GWDTE) based on the NVC surveys. GWDTEs are types of wetland and are specifically protected under the Water Framework Directive (WFD)[30], the purpose of which is to establish an EU-wide framework for the protection of inland surface waters (rivers and lakes), transitional waters (estuaries), coastal waters and groundwater. NVC communities with potential to be highly or moderately groundwater dependent have been identified following SEPA Guidance Note 4[5]. A brief summary of each of the NVC sub-communities recorded within the Study Area is provided below.

Table 7.8: Summary of NVC habitat types recorded within the Study Area

NVC community	EC Habitats Directive Annex 1 habitat	UKBAP Priority Habitat	GWDTE
Woodland			
W18 *Pinus sylvestris – Hyclocomium splendens* woodland	Caledonian forest	Native pine woodland	
W18b *Pinus sylvestris – Hyclocomium splendens* woodland *Vaccinium myrtillus-Vaccinium vitis idaea* sub-community	Caledonian forest	Native pine woodland	
Dry heath			
H9c *Calluna vulgaris-Deschampsia flexuosa* heath, species-poor sub-community	European dry heath;	Upland heathland	
H10a *Calluna vulgaris - Erica cinerea* heath, typical sub-community	European dry heath;	Upland heathland	
H12a *Calluna vulgaris - Vaccinium myrtillus* heath, *Calluna vulgaris* sub-community	European dry heath;	Upland heathland	
H13a *Calluna vulgaris-Cladonia arbuscular* heath *Cladonia arbuscular, Cladonia rangiferina* sub-community	Alpine and subalpine heaths	Upland heathland	
H16c *Calluna vulgaris - Arctostaphylos uva-ursi* heath, *Cladonia* spp. sub-community	European dry heath;	Upland heathland	
Wet heath			
M15b *Trichophorum germanicum - Erica tetralix* wet heath, typical sub-community	Blanket bog; Northern Atlantic wet heaths with *Erica tetralix*	Upland heathland	Moderate
M15c *Trichophorum germanicum - Erica tetralix* wet heath, *Cladonia* spp. sub-community	Blanket bog; Northern Atlantic wet heaths with *Erica tetralix*	Upland heathland	Moderate
Mire			
M6c *Carex echinata - Sphagnum recurvum/auriculatum* mire, *Juncus effusus* sub-community	-	Upland flushes, fens and swamp	High
Blanket Mire			
M2 *Sphagnum cuspidatum/recurvum* bog pool community	Blanket bog	Blanket bog	
M19a *Calluna vulgaris - Eriophorum vaginatum* blanket mire, *Erica tetralix* sub-community	Blanket bog	Blanket bog	
M19b *Calluna vulgaris – Eriophorum vaginatum* blanket mire, *Empetrum nigrum* subsp. *nigrum* sub-community	Blanket bog	Blanket bog	
M19c *Calluna vulgaris – Eriophorum vaginatum* blanket mire, *Vaccinium vitis-idaea - Hylocomium splendens* sub-community	Blanket bog	Blanket bog	
M20a *Eriophorum vaginatum* blanket and raised mire, species-poor sub-community	Blanket bog	Blanket bog	
M20b *Eriophorum vaginatum* blanket and raised mire, *Calluna vulgaris - Cladonia* spp. sub-community	Blanket bog	Blanket bog	
M20x *Eriophorum vaginatum* blanket mire variant communities	Blanket bog	Blanket bog	

[27] Rodwell, J. S. (ed.) 1991. British plant communities. Volume 2. Mires and heaths. Cambridge University Press, Cambridge.

[28] Rodwell, J. S. (ed.) 1992. British plant communities. Volume 3. Grasslands and montane communities. Cambridge University Press, Cambridge.

[29] Averis, A., Averis, B., Birks, J., Horsfield, D., Thompson, D. and Yeo, M. 2004. An Illustrated Guide to British Upland Vegetation. JNCC, Peterborough.

[30] Council Directive 2000/60/EC establishing a framework for Community action in the field of water policy (http://ec.europa.eu/environment/water/water-framework/index_en.html)

NVC community	EC Habitats Directive Annex 1 habitat	UKBAP Priority Habitat	GWDTE
Acid grassland			
U4a *Festuca ovina-Agrostis capillaris-Galium saxatile* grassland, typical sub-community	-	-	
U20c *Pteridium aquilinum - Galium saxatile* community, species poor sub-community	-	-	

7.4.17 A full description of each NVC community and/or sub-community recorded within the Study Area is presented in Technical Appendix 7.1.

Plant species

7.4.18 No nationally Rare[31] plant species were identified within the Study Area. One plant species listed as Nationally Scarce[32] was recorded, Scots pine (*Pinus sylvestris*). Scots pine is also a SBL species.

7.4.19 No protected vascular plant species were recorded within the Study Area. Several lower plant species are listed on Annex V of the Habitats Directive, namely a range of bog-moss species. As these species primarily occur within protected habitats, they have been discounted as independent IEFs and will be encompassed within the impact assessment on blanket bog, wet heath and mire habitat IEFs.

Fish and Macro-invertebrate Survey

7.4.20 The Allt a' Gheallaidh and the Tulchan Burn are moderate sized with wet widths in the range 4 – 10 m. The substrate is dominated by cobbles and boulders in both the Allt a Gheallaidh (mean 87%) and the Tulchan Burn (mean 88%) and siltation is absent. In-stream macrophyte cover is either absent or less than 5% consisting of algae, with the exception of one site on the Allt a' Gheallaidh (AG2 in Figure 7.3) where the common bryophytes yellow fringe-moss (*Racomitrium aciculare*) and long-beaked water feather-moss (*Platyhypnidium riparioides*) together with algae constitute 10% coverage. The absence of bryophytes may indicate unstable substrate conditions. The sites were mainly open with no canopy cover.

7.4.21 Macroinvertebrate communities consisted largely of common and widespread species present in rivers in northeast Scotland and no rarities or species of particular conservation interest were found. Their abundance and diversity were moderate in both the Allt a' Gheallaidh and the Tulchan Burn.

7.4.22 Water Chemistry and Index of Acidity classifications indicated there was no evidence of significant acidification in either watercourse. Low alkalinity and buffering capacity indicated the burns may be vulnerable to episodic acidification.

7.4.23 ASPT scores showed that the water quality is good to excellent in both burns. Both the Allt a' Gheallaidh and the Tulchan Burn should reach the required ecological status for both the ASPT and the NTAXA parameters.

7.4.24 Overall, the watercourses are clean and healthy, free from significant acidification, siltation and organic pollution and communities present and productivity indicated that the watercourses should be capable of supporting sustainable salmonid populations if other environmental variables are suitable.

7.4.25 There were minor differences in invertebrate communities between the impact monitoring sites on the Allt a' Gheallaidh and the controls on the Tulchan Burn but overall the watercourses were similar enough for monitoring purposes (see Technical Appendix 7.3).

7.4.26 Although all of the 2015 electrofishing sites had been used as monitoring sites during the development and construction period of the existing Paul's Hill Wind Farm, it should be noted that site SLB18g, the uppermost site in the Allt a'Gheallaidh, was moved upstream a short distance (30m) into more stable habitat as the original monitoring site had been subject to considerable deposition in recent spate events and was almost unrecognisable from the site photos.

7.4.27 Water levels were low to medium level during all of the surveys and the results obtained are considered to provide a good reflection of the fish populations present.

7.4.28 The electrofishing results from the site surveys are shown in Technical Appendix 7.3.

7.4.29 The SFCC Moray Firth regional classification, based on stream width, for the first run results from each site are shown in Table 7.9 below.

Table 7.9: Allt a'Gheallaidh and Tulchan Burn monitoring electrofishing results classified according to the SFCC Moray Firth regional classification. First run electrofishing results only.

Site code	Location	SFCC width class	Density per 100m2 Salmon fry	Salmon parr	Trout fry	Trout parr
SLB18a	Allt a'Gheallaidh	6 to 9 m	89.8	6.1	15.9	2.3
SLB18c	Allt a'Gheallaidh	4 to 6 m	31.2	11.2	28.0	8.8
SLB18d	Allt a'Gheallaidh	4 to 6 m	0.0	0.0	106.1	10.1
SLB18f	Allt a'Gheallaidh	< 4 m	0.0	0.0	77.0	14.2
SLB18g	Allt a'Gheallaidh	< 4 m	0.0	0.0	180.1	8.1
SLB18e	Allt a'Mhonaidh	< 4 m	0.0	0.0	128.2	4.0
SMB2a	Tulcharn Burn	< 4 m	51.2	20.5	81.9	10.2
SMB2b	Tulcharn Burn	< 4 m	19.5	9.1	92.4	16.9
Key	Absent	Very Low	Low	Moderate	Good	Excellent

Source: Spey Foundation, 2015

7.4.30 In the Allt a'Gheallaidh salmon were found in the lower two sites only but in both of the control sites in the Tulchan Burn. Salmon fry were present in higher densities in the furthest downstream site in both burns.

7.4.31 Trout fry densities were in the excellent category at all sites with trout parr densities ranging from low to good.

7.4.32 The Allt a'Gheallaidh and the Tulchan Burn are accessible to migratory fish throughout the area surveyed but as is often the case salmon were more prevalent in the lower reaches and in the case of the Allt a'Gheallaidh, absent in the middle and upper survey sites.

7.4.33 The only other fish species recorded during the surveys were eels (*Anguilla anguilla*), which were recorded in three sites.

7.4.34 In the Allt a'Gheallaidh the distribution of salmon in 2015 was restricted to the two lower sites with none present in the four upper sites. The Allt a'Gheallaidh is the larger of the two catchments surveyed but salmon appear to be present further upstream in the Tulchan Burn in relation to stream width. Site SLB18d in the Allt a'Gheallaidh has been surveyed on eight occasions since 2002 with salmon present during six of these surveys as shown in Table 7.10.

Table 7.10: Allt a'Gheallaidh site SLB18d electrofishing site history. Colour coding is according to SFCC Moray Firth classification scheme (4 to 6 m wide).

Date	Salmon fry	Salmon parr	Trout fry	Trout parr
08/09/2015	0.0	0.0	106.1	10.1
22/09/2014	0.0	0.0	16.2	11.3

[31] in Great Britain these are interpreted as species which occur in 15 or fewer 10 km x10 km grid squares

[32] Taxa which are recorded in 16-100 10km x 10km grid squares, but not included in one of the Red List Categories

Date	Salmon fry	Salmon parr	Trout fry	Trout parr
11/10/2007	0.0	12.0	57.5	24.0
28/09/2006	18.7	0.0	36.1	16.2
26/09/2005	5.8	0.0	82.2	1.6
22/09/2004		1.0	15.8	8.4
25/08/2003	2.9	1.9	63.5	23.1
29/10/2002	1.0	1.9	41.3	9.3
Key	Absent	Very Low	Low	Moderate	Good	Excellent

Source: Spey Foundation, 2015

7.4.35 Juvenile salmon have never been recorded in SLB18g, the uppermost site, with salmon parr occurring as a single parr only during the 2002/3 surveys in SLB18f. Based on the electrofishing survey site history in the Allt a'Gheallaidh, the upper limit of salmon spawning in most years appears to be in the vicinity of SLB18d, downstream of Alltvounnie. It should be noted that it is often the case that the uppermost juvenile salmon present are parr rather than fry, probably due to migration of the older juveniles upstream of the spawning site.

7.4.36 The densities of trout fry were in the excellent categories in all sites, indicating the importance of both these tributaries as spawning burns for trout. Direct observations of spawning fish suggest that both burns are used primarily by spawning sea trout rather that adult brown trout from the River Spey, although both types may be present. Spawning trout are likely to be present throughout the survey areas in both burns; indeed sea trout are known to utilise headwater streams down to less than 1 m wide for spawning.

7.4.37 The fish densities recorded in 2015 are generally within the typical range recorded at these sites in the past although the trout fry densities are highest recorded at all sites except SLB18a where it was very close to the highest. In contrast the trout parr densities are generally average or below average at all sites. The same general pattern of good fry densities and lower parr densities were recorded at many sites across the Spey catchment in 2015 by the Spey Foundation. The large spate which occurred in August 2014, causing significant morphological changes and fish mortality at many locations, is considered to be a significant factor explaining reduced parr densities in 2015. Although the August spate may have caused considerable damage to juvenile fish stocks, the consequent sediment movements and deposition provided excellent spawning conditions in the autumn of 2014. In addition, the reduced parr densities would have resulted in less competitive pressure on the 2015 year class of fish, potentially resulting in enhanced survival of that cohort.

Bat Survey

Bat roost assessment

7.4.38 The walkover did not identify any bat roosts or potential bat roosts within 200 m of the proposed turbine locations. Target notes from the daytime inspection of trees and other structures with the potential to support bat roosts are presented in Technical Appendix 7.2. The updated turbine layout since the bat survey in 2014 means that a part of the upper Caochan Laith burn is now within 200 m of T1 and T2, and some-suitable roost features may be present in woodland bordering the burn. This will require checks for roost potential prior to any construction work taking place.

7.4.39 As part of the static bat activity survey discussed below a static detector at Reference Sample Location 6 was located within the relatively sheltered and wooded gully along the Caochan Laith (see Figure 7.2) just north of the access track between T1 and T2.

7.4.40 No typical habitat features for foraging or commuting bats are present in the open and exposed hillsides around proposed turbine locations

Static bat activity survey

7.4.41 Data collected during the static detector survey yielded a total of 513 bat contacts from a total of 80 detector nights and the following species were confirmed:

- Common pipistrelle (*Pipistrellus pipistrellus*);
- Soprano pipistrelle (*Pipistrellus pygmaeus*);
- Daubenton's bat (*Myotis daubentonii*);
- Natterer's bat (*Myotis nattereri*); and
- Brown long-eared bat (*Plecotus auritus*).

7.4.42 Soprano pipistrelle was the most frequently recorded species, accounting for almost half of the total bat contacts recorded during the automated survey. Results are summarised in Table 7.11.

Table 7.11: Summary of total bat contacts

Species	May	July	Sept	Total contacts
Pipistrellus pipistrellus	28	23	136	187
Pipistrellus pygmaeus	39	6	181	226
Pipistrellus sp.	0	5	74	79
Myotis daubentonii	1	0	2	3
Myotis nattereri	0	0	1	1
Myotis sp.	0	0	11	11
Plecotus auritus	1	0	4	5
Unidentified bat contact	0	0	1	1
Total contacts	69	34	410	513

Source: FDM, 2014

7.4.43 In order to identify spatial patterns of bat activity across the site by comparing levels of activity at different detector locations, a bat activity index was calculated for all species (combined) by taking the sum of the average nightly bat contacts for each species at each location, and dividing by the number of seasons over which data were collected (i.e. two for Locations 3 and 6, and three for all other locations). This method has ensured that any bias towards locations and survey periods with greater survey effort has been eliminated. Alongside the calculation of an overall activity index for all species combined, an index was also calculated for each species at each location to assess individual species' foraging or commuting preferences across the site. For full details, see Technical Appendix 7.2. Bat activity at each of the sample locations is summarised in Table 7.12 and in Graph 7.1 below.

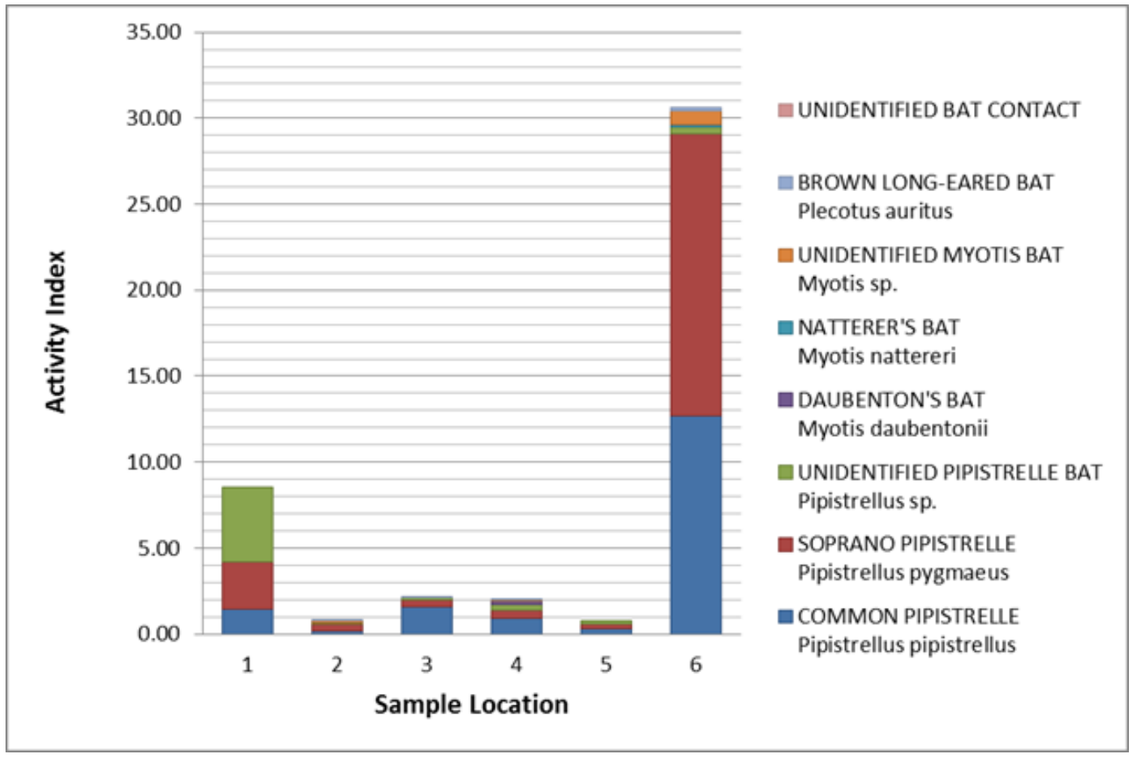
Table 7.12: Average Bat Activity at each sample location

Location	Total nights of data	Common pipstrelle	Soprano pipstrelle	Unidentified pipstrelle	Daubenton's bat	Natterer's bat	Unidentified myotis bat	Brown long-eared bat	Unidentified bat	Average nightly bat contacts (all sp.)
1	15	1.47	2.73	4.33	0	0	0	0	0	8.53
2	15	0.2	0.4	0.07	0	0	0.13	0.07	0	0.87
3	10*	1.6	0.4	0.1	0	0	0	0.1	0	2.2
4	15	0.93	0.47	0.33	0.2	0	0.07	0.07	0	2.07

Location	Total nights of data	Common pipstrelle	Soprano pipstrelle	Unidentified pipstrelle	Daubenton's bat	Natterer's bat	Unidentified myotis bat	Brown long-eared bat	Unidentified bat	Average nightly bat contacts (all sp.)
5	15	0.33	0.27	0.2	0	0	0	0	0	0.8
6	10**	12.7	16.4	0.4	0	0.1	0.8	0.2	0.1	30.7

*Source: FDM, 2014. * Detector malfunction at Location 3 during deployment 3 (September) **Battery failure at Location 6 during deployment 2 (July).*

Source: FDM, 2014



Graph 7.1: Bat activity per sample location

7.4.44 Sample Location 6, which in 2014 was a reference location in relation to the turbine layout that was current at the time, recorded greater levels of bat activity than locations situated in more open habitats. This is likely to be due to its more sheltered situation within a wooded gully to the northeast, and linkage within a landscape context to areas of higher quality habitat and potential roosting sites. Although Sample Location 1 had the next highest level of bat activity with an activity index of 8.53, within a wider context this level of activity is very low, and results appear to have been somewhat skewed by much higher recorded levels of activity during the September survey.

7.4.45 Activity levels across the site not only varied between locations but also between survey periods. The highest levels of activity were recorded during the September period, with lower levels in the May and July survey periods. Seasonal differences have been measured based on the total average nightly passes (all species), and a seasonal activity index calculated by taking the sum of the average nightly bat contacts (all species) for each survey period, and then dividing by the number of locations assessed (excluding any locations which failed: Location 6 in July and Location 3 in September). Results are summarised in Table 7.13 below.

Table 7.13: Bat activity indices per survey month

Survey month	May	July	September
Seasonal activity index (all locations)	2.30	1.36	16.40

Source: FDM, 2014

7.4.46 Reasons for increased activity during the September static detector survey are not clear but may be, in part, a result of the emergence of young bats, which will be on the wing by mid-August, temporarily increasing the number of mobile individuals. Dispersal from maternity roosts by this time of year to transitory or mating roosts, possibly nearer to the site, is likely to also contribute to those higher levels of activity recorded in September. For further details see Technical Appendix 7.2.

7.4.47 One indication that bats may be roosting on or near to the Bat Study Area would be records of bat contacts at, or soon after, the typical emergence time of a species. Pipistrelle bats tend to emerge within the first 10-30 minutes after sunset. *Myotis* bats will typically emerge later than pipistrelle bats, with Daubenton's bats emerging up to an hour after sunset. In order to investigate the likelihood of nearby bat roosts, the earliest passes of each species at each location per night have been extracted from the data, and the number of minutes after sunset calculated for each. Because the majority of bats recorded on this site are pipistrelle bats, only those contacts within 1 hour of sunset have been considered.

7.4.48 Both common pipistrelle and soprano pipistrelle contacts were recorded at sample location 6 during the May survey and sample locations 1, 4, 5 and 6 during the September survey within one hour of sunset. Earliest records were from sample location 6, where soprano pipistrelle was recorded at 19 minutes after sunset on one occasion (on other evenings between 29 and 56 minutes after sunset) and common pipistrelle was recorded at 31 minutes after sunset. Soprano pipistrelle was recorded at sample location 6 within one hour of sunset on all five survey evenings in September; whereas common pipistrelle was recorded on four evenings. No other bat species were recorded within one hour of sunset during the static detector survey. For further results, see Technical Appendix 7.2.

7.4.49 The patterns of bat activity in relation to sunset time indicate the presence of low numbers of roosting bats in the nearby area, most likely outwith the Bat Study Area to the north east, as indicated by records of bats within 60 minutes of sunset at sample location 6. As discussed above, a pre-construction survey will be required for roost potential in the unsurveyed trees lining Caochan Laith burn.

Transect bat activity survey

7.4.50 Only 12 bats contacts were recorded during the three transect surveys. No bats were recorded during the May transect. Bat contacts were also relatively evenly distributed along the length of the transect route, showing no areas along the route with greater recorded bat activity. Full results from the transect surveys are provided in Table 7.14 and Technical Appendix 7.2.

Table 7.14: Bat transect survey results

Transect	Night of	Time	Grid Reference	Species
1	21/05/2014	-	-	NO BATS
2	15/07/2014	23:51	NJ 11701 41726	*Pipistrellus pipistrellus*
2	15/07/2014	23:53	NJ 11817 41595	*Pipistrellus* sp.
2	15/07/2014	23:53	NJ 11900 41481	*Pipistrellus pipistrellus*
2	16/07/2014	00:17	NJ 15614 41418	*Pipistrellus pipistrellus*

Transect	Night of	Time	Grid Reference	Species
3	11/09/2014	20:45	NJ 09081 42318	*Pipistrellus pygmaeus*
3	11/09/2014	21:18	NJ 10476 42283	*Pipistrellus pipistrellus*
3	11/09/2014	21:19	NJ 10484 42273	*Pipistrellus pipistrellus*
3	11/09/2014	21:19	NJ 10487 42269	*Pipistrellus pipistrellus*
3	11/09/2014	21:29	NJ 10858 41886	*Pipistrellus pygmaeus*
3	11/09/2014	21:50	NJ 13464 41252	*Pipistrellus pipistrellus*
3	11/09/2014	21:54	NJ 13986 41639	*Pipistrellus pipistrellus*
3	11/09/2014	22:01	NJ 15433 41402	*Pipistrellus pipistrellus*

Source: FDM. 2014

Information Gaps

7.4.51 The 2014 and 2017 Phase 1 habitat and NVC surveys covered most of Paul's Hill II Development Area used for the habitat loss calculations. However, recent changes in the location of some infrastructure such as the substation and borrow pit search areas, resulted in some survey gaps. As a result, data from Phase 1 habitat and NVC surveys carried out in 2016 for monitoring purposes at the existing Paul's Hill Wind Farm across the whole ownership site boundary have been used to fill in the gaps. It should be noted that due to the extensive area covered in the 2016 surveys (all of the Paul's Hill ownership boundary), the data provided is not as detailed as that provided in the 2014 and 2017 surveys. However, given the limited range of habitat types present within the ownership boundary, these broader-scale data are sufficient for the purposes of EcIA.

7.4.52 The updated turbine layout since the bat survey in 2014 means that a section of the upper Caochan Laith burn is now within 200 m of T1 and T2, and some-suitable roost features may be present in woodland bordering the burn. This will require checks for roost potential prior to any construction work taking place. Should any roosts be present appropriate mitigation will be proposed, including applying to SNH for a licence to disturb roosts (if required), to ensure no breach of legislation relating to bats.

7.4.53 The Study Area for habitat surveys included the Paul's Hill II Development Area within the vicinity of the turbines. However, there is not any survey data for the access route for abnormal deliveries from the main A95 road along the B9138 and B9102 roads to the access track of the existing Paul's Hill Wind Farm, and the cable route to the substation at Glenfarclas. This section of the proposed wind farm development may have impact upon habitat and trees lining the route (although dependent on the turbine model and turbine delivery method the existing access route may suffice without adaptation). When full details of the abnormal delivery route and grid route have been finalised, essential surveys (if required) to inform and assess the potential impacts associated with this section of the Paul's Hill II Development Area will be submitted, and appropriate mitigation proposed.

7.5 ASSESSMENT OF EFFECTS

7.5.1 This section provides an assessment of the likely effects of Paul's Hill II Wind Farm on Important Ecological Features (IEFs). For each IEF, the potential effect is assessed for each of the construction, operation and decommissioning phases of Paul's Hill II Wind Farm. A summary of impacts on each IEF in the absence of mitigation is provided in 'Predicted Effects' below.

Ecological Feature Assessment

7.5.2 On the basis of the description of the ecological baseline and the definitions provided in Table 7.3, a summary of the habitats and species identified as IEFs within Paul's Hill II Wind Farm is provided in Table 7.15 below, together with the legislation and guidance defining their value.

7.5.3 In identification of designated sites as IEFs, consideration has been given to the existence of pathways for effects to occur. This includes direct effects such as impact on habitats and indirect effects through downstream hydrological connectivity (see Chapter 10: Hydrology, Geology and Hydrogeological Assessment for details on catchments and groundwater systems around the proposed Paul's Hill II Wind Farm).

7.5.4 Where habitat mosaics have been identified by the baseline survey, the constituent Phase 1 habitat types are taken to be the relevant IEF.

7.5.5 Receptors of negligible conservation value are not considered further in this assessment; these receptors are generally common and widespread habitats/species (see Table 7.3 for definition of negligible).

7.5.6 This section provides an assessment of the likely effects of the proposed wind farm on the IEFs. For each IEF, the potential effect is assessed for each of the construction, operation and decommissioning phases of the proposed wind farm development.

Table 7.15: Summary of Important Ecological Features within the Study Area

Potential Important Ecological Feature (IEF)	Relevant legislation and guidance	Conservation Value	Important Ecological Feature	Rationale
Designated Sites				
River Spey SAC	SACs are protected sites designated under the Habitats and Species Directive (92/43/EEC). Article 3 of the Habitats Directive requires the establishment of a European network of important high-quality conservation sites that will make a significant contribution to conserving the habitat types and species identified in Annexes I and II of the Directive (as amended). The listed habitat types and species are those considered to be most in need of conservation at a European level	International	Yes	Paul's Hill II Development Area is within the catchment area of the River Spey and hence, hydrologically connected. The River Spey SAC is situated approximately 1700 m from the nearest turbine and the nearest infrastructure (access track for turbine delivery) crosses over the river. It is designated for sea lamprey, Atlantic salmon, otter and freshwater pearl mussel. The watercourses across the Paul's Hill II Development Area drain into the Allt a'Gheallaidh and Allt Arder, which are both major tributaries to the River Spey with Allt a'Gheallaidh being part of the designated site.

Potential Important Ecological Feature (IEF)	Relevant legislation and guidance	Conservation Value	Important Ecological Feature	Rationale
	(excluding birds that are covered under SPAs and assessed in the ornithology chapter).			
River Spey SSSI	A SSSI is an area that has been notified as being of special interest due to its flora, fauna or geological or physiographical features under the Wildlife and Countryside Act 1981 (as amended) and the Nature Conservation (Scotland) Act, 2004	National	Yes	Paul's Hill II Development Area is within the catchment area of the River Spey and hence, hydrologically connected. The River Spey SSSI is situated just over 4 km from the nearest turbine and the nearest infrastructure (access track for turbine delivery) crosses over the river. It is designated for sea lamprey, Atlantic salmon, otter and freshwater pearl mussel. The watercourses across the Paul's Hill II Development Area drain into the Allt a'Gheallaidh and Allt Arder, which are both major tributaries to the River Spey.
Habitats				
Semi-natural coniferous woodland	Semi-natural coniferous woodland can be included within Annex 1 habitat 'Caledonian forest' and is afforded protection under the EC Habitats Directive. Native pinewoods are described in the UKBAP and listed on the SBL.	Local	Yes	Within the Paul's Hill II Development Area a small extent of semi-natural coniferous woodland (including vegetation corresponding to the W18 NVC community) is present. This represents examples of the Annex 1 habitat Caledonian forest which only occurs in Scotland and the UKBAP priority habitat native pinewoods which is restricted to that part of the Scottish Highlands where Scot's pine occurs as a native species. Due to the limited extent of this habitat type within the survey area, this habitat is not considered to be an important example in national or regional terms, but it is locally important as it enriches the ecological resource within a local context, due to providing habitat diversity in an otherwise fairly uniform site.
Scattered coniferous trees - Scot's Pine	None	Local	Yes	Scot's pine is a native species and an important component of semi-natural coniferous woodlands in the Scottish Highlands. Scattered Scot's pine trees across the Paul's Hill II Development Area enrich the ecological resource within a local context, due to providing habitat diversity in an otherwise fairly uniform site.
Bracken – continuous	None	Negligible	No	Bracken has the potential to spread through open areas and as a result it occurs widely within a variety of habitats throughout Scotland. Due to its invasive nature, bracken has the potential to negatively impact the ecology of the area.
Dry dwarf shrub heath – acid	Dry dwarf shrub heath is included within the Annex I habitat 'European dry heaths' and is afforded protection under the EC Habitats Directive. Upland heathland is described in the UKBAP and is listed on the SBL.	Local	Yes	Within the Study Area, a small extent of acid dry dwarf shrub heath (including vegetation corresponding to the H9, H10, H12 and H16 NVC communities) is present. This represents an example of the Annex 1 habitat European dry heaths. Overall, the UKBAP priority habitat upland heathlands is common throughout the uplands of Scotland. Due to the limited and very patchy extent of this habitat type within the Study Area, this habitat is not an important example in national or regional terms, but it is locally important in the context of the Paul's Hill estate area.
Wet dwarf shrub heath	Wet dwarf shrub heath is included within the Annex I habitat 'Northern Atlantic wet heaths with Erica tetralix' and is afforded protection under the EC Habitats Directive. Upland heathland is described in the UKBAP and is listed on the SBL. Wet heath is recognised as having moderate groundwater dependence, and may be classed as a GWDTE and be afforded protection under the WFD.	Local	Yes	Within the Paul's Hill II Development Area, a small extent of wet heath (vegetation corresponding to the M15 NVC community) is present, typically forming mosaics with other mire communities. Wet heath is widespread in the north and west of Great Britain. The wet heath within the Study Area is small in extent and usually fragmented and patchy and as such this habitat is of no greater than local importance.
Lichen/Bryophyte heath	Lichen/Bryophyte heath is included in the Annex 1 habitat 'Alpine and boreal heath'	Local	Yes	Within the Study Area, a small extent of lichen/bryophyte heath (includes vegetation corresponding to H13 NVC community) is present. This represents examples of the Annex 1

Potential Important Ecological Feature (IEF)	Relevant legislation and guidance	Conservation Value	Important Ecological Feature	Rationale
	and is afforded protection under the EC Habitats Directive. Upland heathland is described in the UKBAP and is listed on the SBL.			habitat Alpine and boreal heaths. The most extensive and best-developed examples of Alpine and boreal heaths are found in the Scottish Highlands, with *Calluna – Cladonia* (H13) better-developed and restricted to the eastern Highlands. Due to the limited and very patchy extent of this habitat type within the Study Area, this habitat is not an important example in national or regional terms, but it is however locally important in the context of the Paul's Hill estate area.
Blanket bog	Blanket bog is an Annex I habitat and afforded protection under the EC Habitats Directive. Blanket bog is described in the UKBAP and is listed on the SBL	Regional	Yes	Blanket bog habitats are the most extensive habitat type across the Study Area. Almost all blanket bog is dominated by heather (a SBL species) and hare's-tail cottongrass with bare peat and hagging rarely present. Blanket bog is one of Scotland's most common semi-natural habitats, covering some 1.8 million hectares, 23% of Scotland's land area[33]. Although blanket bog is widespread, it is important in a European context and is found primarily in the UK and Ireland. Due to the extent and condition of the blanket bog within the Study Area it is of regional importance.
Dry modified bog	Blanket bog is described in the UKBAP and is listed on the SBL and this habitat encompasses all areas of blanket bog supporting semi-natural blanket bog vegetation, regardless of its status as 'active' or peat-forming.	Local	Yes	Dry modified bog is common in gullies where hare's-tail cottongrass is dominant and ericoid shrubs largely absent. This habitat type is also extensive in the south of the Study Area where the impacts of burning and subsequent grazing pressure, and in some areas additional impacts due to heather beetle, have resulted in limited regeneration of a continuous sward. Bog-mosses are largely absent. Due to the modified nature of this habitat type and scattered or limited heath element, this habitat is of no greater than local importance.
Flush and spring – acid/neutral	Upland flushes, fens and swamps are described in the UKBAP, and are priority habitats listed on the SBL. Acid and neutral flush vegetation communities are recognised as GWDTEs and afforded protection under the WFD.	Negligible	No	Within the Study Area, there is a small extent of acid flush habitat (vegetation corresponding to the M6c NVC sub-community) often forming mosaics with several other habitat types. The M6 NVC community is the most widespread soligenous mire habitat in the British uplands, with the rush-dominated M6c sub-community being the most prevalent, and as such the flush habitats at the proposed Paul's Hill II Wind Farm are unlikely to be of local importance as they are limited and patchy in extent, not species rich, and do not appreciably enrich the ecological resource within the local context. However, where M6 comprises greater than 20% of habitat mosaics this habitat may have high dependence on groundwater flow, and therefore be classed as a GWDTE. This aspect has been assessed separately in Section 7.5.
Standing water - oligotrophic	Standing waters (i.e. ponds) are described in the UKBAP based on their nutrient content and pH. Ponds are also listed on the SBL.	Local	Yes	Two small water bodies are present in the Study Area. They are oligotrophic, with an acid, nutrient poor character, with no macro-aquatic vegetation present. These habitats are widespread across Scotland. Although the ponds are not thought likely to fulfil the UKBAP criteria for the pond priority habitat, in the absence of a complete freshwater invertebrate assessment it is treated as locally important by this assessment as a precautionary approach.
Running Water -oligotrophic	Rivers and streams are described in the UKBAP and are also listed on the SBL. The running water present across the site form tributaries of the River Spey SAC which is designated for, sea lamprey, Atlantic salmon, otter and freshwater pearl mussel.	Regional	Yes	The watercourses present flow into the Allt a'Gheallaidh and Allt Arder, both major tributaries to the River Spey SAC with the former being part of the designated site. The Allt a'Gheallaidh and Allt Arder are known to support juvenile salmon and trout. Given the above, the watercourses within the proposed development area have the potential to be of importance in regional terms.

[33] SNH website, https://www.snh.scot/landscapes-habitats-and-ecosystems/habitat-types/mountains-heaths-and-bogs/blanket-bog Last accessed 08/11/2017

Potential Important Ecological Feature (IEF)	Relevant legislation and guidance	Conservation Value	Important Ecological Feature	Rationale
Groundwater Dependent Terrestrial Ecosystems (GWDTEs) are habitats that have potential of being either highly groundwater dependent or moderately groundwater dependent depending on the hydrogeological setting	GWDTEs afforded protection under the WFD	N/A	Yes	There is a requirement under the WFD to carry out assessment of the likely impacts of development on habitats which are dependent on groundwater in line with SEPA LUPS guidance[34]. Guidance states that survey of all habitats within 250 m of excavations greater than 1 m deep is undertaken, and within 100 m of all other excavations. The survey work undertaken identified two habitat types with high or moderate potential to support GWDTEs. Of the identified potential GWDTE habitats, the M15 wet heath community is assessed by SEPA as having moderate dependency on groundwater in certain hydrological settings, whilst M6 mire is assessed as having high dependency on groundwater depending on the hydrogeological setting (see Table 7.8 and Chapter 10: Hydrology, Geology and Hydrogeological Assessment). The M6 mire habitat has a relatively patchy distribution across the site with the largest areas being recorded upstream from the headwater of streams and along the stream banks. The M15 mire habitat is unlikely to have significant dependency on groundwater within the Paul's Hill II Development Area as it located in areas with little deep peat (>0.5 m) and limited potential for groundwater flooding (see below in this section).
Species				
Fish	Atlantic salmon are listed on Appendix III of the Bern Convention and Annex II and V of the EC Habitats & Species Directive. Sea Lamprey are listed on Annex II of the EU Habitats Directive and Appendix III of the Bern Convention. . Atlantic salmon, brown trout and sea lamprey species are listed on the SBL. The watercourses present across the site form tributaries of the River Spey SAC which is designated for sea lamprey and Atlantic salmon.	National	Yes	Atlantic salmon is widely distributed throughout Europe and UK, with Scottish rivers in particular being a European stronghold for the species. The River Spey supports one of the largest populations in Scotland. Findings from the fish surveys undertaken by the Spey Foundation in 2015 and results of historic electrofishing survey results from 2010 until 2014 indicate that salmon fry and parr are present in the watercourses Allt a'Gheallaidh and Allt Arder. There are also juvenile trout present in both watercourses with a good healthy population in Allt a'Gheallaidh. Eels were also present in Allt a'Gheallaidh. The sea lamprey occurs in estuaries and easily accessible rivers over much of the Atlantic coastal area of western and northern Europe and is reasonably widespread in UK rivers where it is still common in some places. It appears to reach its northern limit of distribution in Scotland and the River Spey is virtually at the northern limit for this species. Recent surveys show that sea lamprey larvae are widely distributed throughout the middle and lower reaches of the river, which is hydrologically connected to the Paul's Hill II Development Area. Due to the activity recorded during these surveys and the protection status as a qualifying feature of the River Spey SAC and SSSI, fish populations have the potential to be important in National terms.
Bats	All bat species are protected under the Conservation of Habitats and Species Regulations 2010 (as amended) (Habitat Regulations). Common and soprano pipistrelles, Daubenton's bat, Natterer's bat and Brown long-eared bat are listed on the SBL.	Local	Yes	In 2014, no bat roosts or potential bat roost sites were identified within 200 m of proposed turbine locations but activity by bats in relation to sunset time indicates the probable presence of roosts to the northeast of the Bat Study Area. As the proposed turbine locations have been modified since the bat survey in 2014, some trees may not have been checked for roosts including trees bordering the Caochan Liath within 200 m of T1 and T2. However, it is unlikely that many bats will choose to roost there given the unsuitability of surrounding habitats. Automated static bat detector, Reference Sample Location 6 was located within the stream valley between the proposed locations of T1 and T2, and the earliest contact of any species was 19 minutes within sunset for one night in September. But on other detector nights the earliest contact time varied from 29 minutes to 56 minutes within sunset. This lack of bats within sunset indicates that it is probable that there are no nearby roosts.

[34] SEPA (2014) Land Use Planning System SEPA Guidance Note 31: Guidance on Assessing Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems

Potential Important Ecological Feature (IEF)	Relevant legislation and guidance	Conservation Value	Important Ecological Feature	Rationale
				As there are no typical habitat features for foraging or commuting bats present in the open and exposed hillsides around proposed turbine locations and only very low levels of activity were recorded in these locations the proposed wind farm development is considered, at most, of local conservation importance for all occurring species of bats.

Predicted Effects

Site Preparation and Construction Effects - Habitats

7.5.7 The site preparation and construction phase of the proposed Paul's Hill II Wind Farm will result in habitat loss due to construction of access tracks, turbine bases, crane hardstandings, construction compound, construction of a substation, borrow pits and other associated infrastructure representing a total area of 14.387 ha. This is 9.321% of the surveyed Paul's Hill II Development Area as shown in Figure 7.1.

7.5.8 The extent of permanent and temporary loss of each of the habitats present on site is shown in Table 7.16. Temporary loss refers to areas that will be reinstated following construction and it is expected that habitats within these areas will return to their original state or type present prior to construction within the lifespan of the development (35 years), with a confident expectancy of within ten years post-construction due to the good condition of the surrounding habitat. Additionally, monitoring of reinstated habitats at the existing Paul's Hill Wind Farm has recorded regeneration of typical blanket bog species such as heather and hare's-tail cotton-grass and bryophytes during the first seven years of operation[35]. The total area of temporary loss of habitat is 10.160 ha with a total area of permanent habitat loss of 4.226 ha.

7.5.9 In order to give a complete picture of the total extent of habitat loss, Table 7.16 below includes all habitats recorded, not just those identified as IEFs. However, only those habitats which have been identified as IEFs are assessed or discussed further in this assessment.

Table 7.16: Extent of loss of each of the habitats present within the surveyed area of Paul's Hill II Development Area

Phase 1 Habitat type	Extent within Development Area (ha)	Extent of permanent and temporary loss within the Development Area (ha)	% of permanent and temporary loss within the Development Area	Extent of permanent loss with Development Area (ha)	% permanent lost within Development Area
Semi-natural Coniferous Woodland	0.263	0.055	20.842	0.005	1.947
Bracken - continuous	0.406	0.011	2.742	0.011	2.742
Dry dwarf shrub heath - acid	10.793	0.113	1.043	0.070	0.653
Wet dwarf shrub heath	1.514	0.000	0.000	0.000	0.000
Lichen/Bryophyte Heath	0.309	0.000	0.000	0.000	0.000
Blanket Bog	121.137	11.717	9.753	2.952	1.457
Blanket Bog with Scattered Coniferous Trees	0.373	0.132	35.278	0.130	34.917
Dry Modified Bog	19.293	2.261	11.721	1.030	5.339
Dry Modified Bog with Scattered Coniferous Trees	0.163	<0.001	0.078	<0.001	0.078
Flush and spring – acid/neutral	1.033	0.098	9.454	0.027	2.660
Standing Water	0.059	0.000	0.000	0.000	0.000
Please note the above figures have been rounded down to three decimal places, but calculations are based on figures with unlimited number of decimal places, hence percentages may not match exactly if recalculated from the figures in this table					

7.5.10 The following assumptions have been made during the habitat loss calculations:

- A total width of 7.5 m has been assumed for all new access tracks. This includes a 5 m wide road and an extra 2.5 m to account for a drainage ditch on one side of the track and a cable trench. This width has been assumed as a worst case calculation as depending on the underlying topography some sections of track may not require this extent of land take to incorporate side drainage.
- The existing track is assumed to be 7 m, no additional land take will be required where use of or upgrade of existing tracks has been incorporated into the design of the proposed Paul's Hill II development.

Semi-natural coniferous woodland (A1.2.1) and Scattered trees – coniferous (A3.2)

7.5.11 The total extent of semi-natural coniferous woodland is 0.263 ha, which comprises 0.171% of the Paul's Hill Development Area. 1.947% (0.005 ha) of the semi-natural coniferous woodland will be permanently lost due to preparation and construction of the access track and turbines. This is very small amount of habitat loss and it is likely there will be no or very limited felling of trees as a result of micrositing of the infrastructure.

7.5.12 Coniferous scattered trees are present within Paul's Hill II Development Area in mosaic with blanket bog (total area of 0.373 ha, 0.242% of the surveyed Paul's Hill II Development Area) and dry modified bog (total area of 0.163 ha, 0.106% of the Paul's Hill II Development Area). 0.130 ha of the blanket bog with scattered coniferous trees will be permanently lost due to preparation and construction of the access tracks, turbine bases and crane pads. Less than 0.001 ha dry modified bog with scattered trees will be temporarily or permanently lost to construction of infrastructure. This is very small amount of habitat loss and there is a probability that there will be no or very limited felling of trees as a result of micro-siting of the infrastructure.

7.5.13 Construction activities may also result in disturbance or damage to this habitat type from dust created from construction activities. Dust particles can interfere with photosynthesis, transpiration and respiration of vascular plants. However, due to the amount of rainfall in this part of Scotland, it is unlikely that sufficient dust will be generated, or remain in situ for long enough, to cause a measurable change in the feature. There is also a small (unlikely) risk of areas of this habitat being damaged as the result of an accidental pollution incident during the site preparation and construction phase.

7.5.14 Any unmitigated effects of preparation and construction in terms of risk of impacts from pollution and/or dust on semi-natural coniferous woodland and scattered, naturally regenerated, young Scot's pine trees are predicted (probable) to be of **negligible** magnitude and therefore **not significant**. However, due to the overall uniformity of

[35] Natural Power (2013) Paul's Hill Wind Farm: Ecologist Report 2013, Document Reference: XREPORT_E-1040601

habitats at the proposed Paul's Hill II Wind Farm, and the limited extent of this habitat present, mitigation such as micrositing will be applied to ensure impacts are minimised.

Dry dwarf shrub heath – acid (D1.1)

7.5.15 The total extent of dry dwarf shrub heath is 10.793 ha, which comprises 6.993% of the surveyed Paul's Hill Development Area. 1.043% (0.070 ha) of dry heath will be permanently lost due to preparation and construction of access tracks, turbine bases and crane pads. This is a very small area of habitat loss in a local context.

7.5.16 Construction activities may also result in disturbance or damage to this habitat type from dust created from construction activities. There is also a small (unlikely) risk of areas of this habitat being damaged as the result of an accidental pollution incident during the site preparation and construction phase.

7.5.17 Any unmitigated effects of preparation and construction in terms of risk of impacts from dust on dry dwarf shrub heath are predicted (probable) to be of **minor negative** magnitude and therefore **not significant**.

Wet dwarf shrub heath (D2)

7.5.18 The total extent of wet dwarf shrub heath is 1.514 ha which comprises 0.981% of the surveyed Paul's Hill Development Area. No wet dwarf shrub heath will be lost due to preparation and construction. Wet dwarf shrub heath has been identified as a GWDTE, and some areas of this habitat type are located within 250 m of turbine foundations, and 100 m from other infrastructure such as track[5] (see Figure 7.4). Construction activities may result in indirect effects on wet dwarf shrub heath due to changes in underlying hydrological flow; construction activities have the potential to interrupt hydrological connectivity and affect the overall integrity of this habitat type. There is also a small (unlikely) risk of areas of this habitat being damaged as the result of an accidental pollution incident during the site preparation and construction phase.

7.5.19 Construction activities may also result in disturbance or damage to this habitat type from dust created from construction activities as it is adjacent to an existing access track and about 40 m south of a new access track and therefore, may be impacted by increases in site traffic.

7.5.20 Any unmitigated effects of preparation and construction in terms of hydrology and risk of impacts from dust on dry dwarf shrub heath are predicted (probable) to be of **minor negative** magnitude and therefore **not significant**.

Lichen/Bryophyte heath (D3)

7.5.21 The total extent of lichen/bryophyte heath is 0.309 ha which comprises 0.200 % of the surveyed Paul's Hill Development Area. No lichen/bryophyte heath will be lost due to preparation and construction.

7.5.22 However, construction activities may result in disturbance or damage to this habitat type from dust created from construction activities as it is within 50 m of an existing access track. Non-vascular plants such as bryophytes and lichens are highly susceptible to adverse impacts of dust and changes in surface conditions[36] [37].

7.5.23 Any unmitigated effects of preparation and construction in terms of risk of impacts from dust on lichen/bryophyte heath are predicted (probable) to be of **moderate negative** magnitude and therefore **not significant**.

Blanket bog (E1.6.1)

7.5.24 The total extent of blanket bog is 122.137 ha, which comprises 77.837 % of the surveyed Paul's Hill II Development Area. Blanket bog is present with scattered conifer trees, with a total extent of 0.373 ha, 0.242 % of the surveyed Paul's Hill II Development Area. A total of 2.952 ha (2.457 %) of the blanket bog and 0.130 ha (34.917 %) of blanket bog with scattered conifer trees will be permanently lost during preparation and construction of the turbines, crane pads, access tracks and substation. The potential for blanket bog restoration will be investigated within the site's ownership boundary (see 'Habitat Management Plan' in Mitigation section below).

7.5.25 Construction activities may result in indirect effects on blanket bog due to changes in underlying hydrological flow; construction activities have the potential to interrupt hydrological connectivity and affect the overall integrity of this habitat type. There is also a small risk of disturbance or damage to this habitat type from dust created from construction activities. Non-vascular plants such as mosses are highly susceptible to adverse impacts of dust and changes in surface conditions[36] [37]. There is also a small risk of pollution incidents occurring during the preparation and construction of the proposed Paul's Hill II development, potentially impacting on the plant species present.

7.5.26 Any unmitigated effects of preparation and construction, in terms of hydrology and risk of impacts from dust, on blanket bog are predicted (probable) to be of **moderate negative** magnitude and therefore **not significant**.

Dry modified bog (E1.8)

7.5.27 The total extent of dry modified bog is 19.293 ha, which comprises 12.500 % of the surveyed Paul's Hill II Development Area. Dry modified bog is also present with scattered conifer trees, with a total extent of 0.163 ha, 0.106 % of the surveyed Paul's Hill II Development Area. 11.721 % (1.030 ha) of the dry modified bog and 0.078 % (< 0.001 ha) dry modified bog with scattered conifer trees will be permanently lost during preparation and construction of the turbines, crane pads, access tracks and extension of the control building. This is a very small area of habitat loss in a local context.

7.5.28 Construction activities may result in indirect effects on blanket bog due to changes in underlying hydrological flow; construction activities have the potential to interrupt hydrological connectivity and affect the overall integrity of this habitat type. There is also a small risk of disturbance or damage to this habitat type from dust created from construction activities. Non-vascular plants such as mosses are highly susceptible to adverse impacts of dust and changes in surface conditions[36] [37]. There is also a small risk of water pollution incidents occurring during the preparation and construction of the proposed Paul's Hill II development, potentially impacting on the plant species present.

7.5.29 Any unmitigated effects of preparation and construction, in terms of hydrology and risk of impacts from dust, on blanket bog are predicted (probable) to be of **moderate negative** magnitude and therefore **not significant**.

Standing water (G1)

7.5.30 The total extent of standing water was 0.059 ha which comprises 0.038 % of the surveyed Paul's Hill II Development Area. No loss of this habitat will occur as a result of construction activities.

7.5.31 Preparation and construction activities also have the potential to result in changes to hydrological connectivity of this habitat. Any interruption in flow could result in an alteration to the existing hydrological regime and the overall integrity of this habitat.

7.5.32 There is also a risk of disturbance or damage to this habitat type as the result of an accidental pollution incident during the site preparation and construction phase, or from dust created from construction activities, especially as one of the ponds is within 50 m of an existing track and a new access track.

7.5.33 Any unmitigated effects of preparation and construction are therefore predicted (probable) to be of **moderate negative** magnitude and therefore **not significant**.

Running Water (G2)

7.5.34 A minimum distance of 50 m has been maintained between infrastructure and watercourses where possible, with the exception of three new watercourse crossings. Construction of the watercourse crossings has the potential to restrict flow in the various channels and reduce hydraulic capacity, resulting in a potential increase in flood risk, the promotion of erosion and sedimentation. Works may also result in indirect effects caused by changes to hydrology via access track drainage. There is also a risk of water pollution incidents occurring during preparation and construction, which is discussed further in Chapter 10: Hydrology, Geology and Hydrogeological Assessment.

[36] Farmer, A. (1993). The effects of dust on vegetation – a review. Environmental Pollution. Volume 79, Issue 1, Pages 63-75

[37] Grantz, D., Garner, J., Johnson, D. 2003. Ecological effects of particulate matter. Environment International. Volume 29, Pages 213-39

7.5.35 Any unmitigated effects of preparation and construction on running water are predicted (probable) to be of **moderate negative** magnitude and therefore **not significant**.

Groundwater Dependent Terrestrial Ecosystems (GWDTEs)

7.5.36 The hydrogeological conditions at the proposed Paul's Hill II development are discussed in Chapter 10: Hydrology, Geology and Hydrogeological Assessment; along the riparian corridors and valleys of watercourses the hydrogeological conditions may be conducive to supporting GWDTEs. Away from these areas hydrogeological conditions are not conducive to supporting GWDTEs and are instead supported by rainfall or overland flow.

7.5.37 Two NVC plant communities with the potential to be GWDTEs were recorded within the survey area[5 38]:

- M6c sub-community mire – highly groundwater dependent; and
- M15 (b sub-community and c sub-community) (wet heath) – moderately groundwater dependent

7.5.38 The surveys have shown that few potentially moderately or highly dependent GWDTE habitats are situated within the Paul's Hill Development Area, with only isolated areas of acid flush (M6c) or wet heath (M15) present; the former accounts for 1.03 ha and the latter 1.5 ha. However, some of these areas are located within 250 m of turbines and within 100 m of other infrastructure.

7.5.39 Figure 10.14 in Chapter 10: Hydrology, Geology and Hydrogeological Assessment shows the likely locations of the potentially high and moderately dependent GWDTEs corresponding to the above NVC communities that are situated within close proximity to minor watercourses, correspondingly interpreted as being highly likely to be GWDTEs.

7.5.40 The areas marked 'moderately groundwater dependent' on Figure 10.14 in Chapter 10: Hydrology, Geology and Hydrogeological Assessment, where there is little deep peat and limited potential for groundwater flooding, are unlikely to be groundwater dependent and hence, there will be no additional specific mitigation required for these habitats.

7.5.41 However, any unmitigated impact of preparation and construction could result in a loss of highly groundwater dependent M6c acid flush habitat, such as that present upslope from the headwater of a stream near Turbine 3. This is predicted (probable) to be of **high negative** magnitude and therefore specific mitigation measures will be required to protect these habitats as specified under the WFD.

Site Preparation and Construction Effects – Species

7.5.42 The potential impacts to species during construction are described below.

Fish

7.5.43 During construction, there is potential for the construction of new infrastructure such as turbines, crane pad foundations, access tracks, watercourse crossings, temporary construction compounds, substation and the proposed borrow pits to result in the loss, disturbance or degradation of the surrounding aquatic habitats.

7.5.44 With the exception of access track watercourse crossings, all other infrastructure and proposed borrow pits will be located at a minimum distance of 50 m from watercourses; therefore, there will be no direct loss of aquatic habitats. There will however be a need for three new access track crossings of local watercourses. These will comprise of culvert structures (see Chapter 10: Hydrology, Geology and Hydrogeological Assessment) and will therefore result in direct loss of aquatic habitat under the footprint of the culverts. There may also be further temporary disturbance to stream beds if there is a need to temporarily divert watercourses to enable construction of culverts to take place.

7.5.45 In addition, it is likely that the cable and turbine delivery route will cross the River Spey at the Blacksboat Bridge. It is assumed for the purpose of determining this application that any such works will not have an adverse effect on the River Spey SAC. The environmental impacts of these works will be confirmed prior to construction, assuming as stated in section 4.5 of Chapter 4: Description of Development.

7.5.46 Indirect habitat effects may also arise from construction of watercourse crossings as both require an element of ground/stream bank disturbance in order to construct / install the culvert pipe and lay the road surface. Direct loss of riparian or bankside habitat will occur as will potential temporary degrading/disturbance to in-stream habitat due to the risk of erosion or sediment/construction material polluting the watercourse and being deposited upon the streambed and other aquatic habitats immediately downstream.

The three watercourse crossings required will be located on the upper reaches of the Caochan Liath across typical small headwater burns. Watercourse assessments (see Chapter 10: Hydrology, Geology and Hydrogeological Assessment) excluded the possibility of fish being present due to altitude and/or topographical features downstream from the watercourse crossings. Additionally, SFB have noted that there are waterfalls lying about 800 m upstream of the confluence of the Allt Arder with the River Spey which are impassable to spawning salmon, and as a consequence, the presence of salmon is unlikely in Coachan Liath and Blarnish Burn. As fish are unlikely to be present, the construction of three watercourse crossings will not create barriers to movement of fish Therefore, direct and indirect impacts on fish due to habitat loss at these three locations are considered to be negligible.

7.5.47 Potential impacts on fish populations during the preparation and construction phase are therefore restricted to water pollution incidents or increases in sedimentation.

7.5.48 Fish surveys undertaken as part of the baseline surveys for the proposed wind farm development and results of historic electrofishing survey results from 2010 to 2014 indicate that salmon fry and parr are present in the watercourses Allt a'Gheallaidh and Allt Arder. There are also juvenile trout present in both watercourses with a good healthy population in Allt a'Gheallaidh. Sea lamprey larvae are present throughout the middle and lower reaches of the River Spey.

7.5.49 In the absence of mitigation, there remains a potential impact on fish populations from pollution incidents or contamination of watercourses via sediment or run-off during construction, but given the distances from construction works to sections of watercourse which support fish species, any unmitigated effects of preparation and construction on fish species are considered likely (probable) to be of no more than **moderate negative magnitude** and therefore **not significant**.

Bats

7.5.50 The Paul's Hill II Development Area consists predominantly of open habitat that is of low suitability for foraging and commuting bats. Bat activity was considered very low across open habitats within the Bat Study Area with most activity being attributed to medium risk species, predominately pipistrelle species (Technical Appendix 7.2) and concentrated during the month of September. The loss of habitat to the proposed wind farm development marginally reduces the foraging opportunities within the Paul's Hill II Development Area. Due to abundance of open habitat types present, foraging and commuting habitat loss is considered to be minimal.

7.5.51 The highest concentration of bat activity was at static bat detector location 6 (BAI of 30.7). This area is situated between T1 and T2 at approximately 200 m distance to the nearest turbine, within a sheltered and wooded gully along the Coachan Laith. A new access track between T1 and T2 will be constructed with a watercourse crossing over the Coachan Laith within 20 m to the location of static bat detector location 6. As a consequence, some foraging and commuting behaviour may be altered during construction, but this is likely to be of **minor negative** magnitude and only for a short time period and therefore **not significant**.

7.5.52 No bat roosts or potential bat roost sites were identified within 200 m of proposed turbine locations in 2014 (See Technical Appendix 7.2). As the proposed turbine locations have been modified since the bat survey in 2014, some trees within 200 m have not been checked for roosts including trees bordering the Caochan Liath within 90

[38] SNIFFER, 2009. WFD95: A Functional Wetland Typology for Scotland – Project Report. ISBN: 978-1-906934-21-7

m and 70 m of T1 and T2. In addition, the access track and watercourse crossing of the Coachan Liath between the two turbines passes within 30 m of some trees. However, the low bat activity near sunset at bat detector location 6, located between T1 and T2, indicates that there is a low probability of nearby roosts in this area.

7.5.53 Without pre-construction checks for potential bat roosts within 200 m of the infrastructure, there is a potential risk of disturbance to roosting bats during construction activities.

7.5.54 Any unmitigated impacts of preparation and construction on bat roosts are predicted to be of **negligible** magnitude and therefore **not significant**. However, pre-construction checks of trees within 200 m of construction will be undertaken, and appropriate mitigation applied (with detail provided in the CEMP) should a roost be found.

Operation Effects - Habitats

7.5.55 Operation of the proposed Paul's Hill II development will not cause any additional habitat loss. However, there is a small risk of pollution incidents or major maintenance/repair activities causing damage.

7.5.56 Any unmitigated operational effects on habitats within the Paul's Hill II Development Area are predicted to be of **moderate negative** magnitude and therefore **not significant**.

7.5.57 Operational management plans will ensure the risk of these incidents remains low, and that there is a plan in place to deal with any incidents that do occur.

Operation Effects – Species

7.5.58 The potential impacts to species during operation are described below.

Fish

7.5.59 During operation there remains a risk of contamination of the watercourses from surface water run-off, oil or other leaks from turbine machinery, spills during maintenance or leaks from maintenance vehicles. Prevention and consideration of these effects are further discussed in Chapter 10: Hydrology, Geology and Hydrogeological Assessment. Due to the low levels of site personnel, vehicles or machinery required during operation of the proposed wind farm development within proximity to watercourses, any unmitigated operational effects on fish is considered to be unlikely, of **minor negative** magnitude and therefore **not significant**.

Bats

7.5.60 During the operational phase, rotating turbines present a risk to flying bats as a result of potential collision and / or barotrauma[39] when flying in close proximity to turbines.

7.5.61 Recent research work by Exeter University[40] found that most bat fatalities at UK wind farms were common pipistrelle, soprano pipistrelle and noctule (*Nyctalus noctula*). In addition, single carcasses of brown long-eared bat, Nathusius' pipistrelle (*Pipistrellus nathusii*) and Natterer's bat were recorded. The study also found that the percentage casualty rates for soprano pipistrelle, common pipistrelle and noctule were higher than the relative proportions of their calls recorded from ground level acoustic surveys.

7.5.62 Common and soprano pipistrelle are of medium risk in terms of collision although they are of low risk in terms of any threat to national populations[10]. According to the research work by Exeter University[40], there was a significant association between the number of pipistrelle fatalities and the activity category of the site. For instance, sites categorised as low activity (BAI of 0-2 passes per night for soprano pipistrelle and 0-15 passes per night for common pipistrelle) had significantly fewer pipistrelle fatalities compared to medium and high category sites but there was no difference between sites categorised as medium and high activity. Medium activity was defined as a BAI of 3-30 passes per night for soprano pipistrelle and 16-162 passes per night for common pipistrelle. BAI was in the low category at five out of the six static detector locations (i.e. the five static detectors located in the open habitat areas).

[39] injury caused by a change in air pressure, affecting typically the ear or the lung

7.5.63 Furthermore, the Exeter University study found that the number of bat casualties declined with the area of broad-leaved woodland within a 1500 m radius of wind farms, as these woodlands are possibly providing a better foraging resource for bats. At a smaller spatial scale, the presence of broad-leaved or mixed woodland meant a high probability of no soprano pipistrelle casualties. Therefore, the location of woodland within 1500 m of the Paul's Hill II Wind Farm including a small woodland along the Coachan Liath and larger woodland along the Blarnish Burn between its confluence with Coachan Liath and where it flows into the Allt Alder may help in reducing any potential bat fatalities caused by wind turbines.

7.5.64 Given the very low activity levels recorded for the two pipistrelle species, the most common bats recorded within the Bat Study Area, collision risk of both these species is most likely to be very low. Unmitigated, this will result in a **negligible** effect during operation and is therefore **not significant** in the context of the EIA Regulations.

7.5.65 *Myotis* sp. and brown long-eared bats are assessed by Natural England guidance[10] to be of low risk in terms of collision and threat to national populations. The overall BAI for these low risk species as recorded within the Bat Study Area was low at 0.9 for *Myotis* spp. and 0.1 for brown long-eared bats (Technical Appendix 7.2) and the Exeter study suggests casualties of these species are rare. The effect during operation is therefore considered to be **negligible** in magnitude and therefore **not significant** under the terms of the EIA Regulations.

Decommissioning Effects

7.5.66 Decommissioning effects will be of similar or lower magnitude to the preparation and construction phase effects with restoration following decommissioning expected to return the proposed wind farm development to baseline conditions.

Impacts on Designated Sites

International and National Designations

7.5.67 The majority of the watercourses which drain the site discharge to the Allt Arder and Allt a'Gheallaidh, major tributaries of the River Spey, which is designated as a SAC and SSSI. Additionally, the Allt a'Gheallaidh is part of the River Spey SAC. Hydrological connectivity exists with the SAC and SSSI through the upper tributaries of the Allt Arder and Allt a'Gheallaidh. There is therefore the potential for Paul's Hill II Wind Farm to impact on the River Spey SAC and SSSI through pollution, siltation or contamination of watercourses that flow into the tributaries of the River Spey (i.e. run-off, oil spills or other leaks from vehicles or machinery during construction, or run-off and erosion during operation, and water pollution incidents during maintenance activities). However, there is geographical separation of over 4 km between the nearest turbine and River Spey SSSI and about 1.7 km between the nearest turbine and River Spey SAC, and as such any unmitigated impact of preparation, construction or operation on the River Spey SAC and SSSI is therefore predicted to be of no more than **moderate negative** magnitude and **not significant**. In addition, as discussed above, during construction the turbine delivery and grid route are likely to cross over the River Spey SSSI and SAC at the Blacksboat Bridge, and may entail some engineering works in this location. It is assumed for the purpose of determining this application that any such works will not have an adverse effect on the River Spey SAC. The environmental impacts of these works will be confirmed prior to construction, assuming as stated in section 4.5 of Chapter 4: Description of Development.

7.5.68 Under the Conservation (Natural Habitats &c.) Regulations 1994 (as amended) there is a requirement to carry out a Habitats Regulations Appraisal of impacts on the River Spey SAC and this is presented in Section 7.11 below.

7.6 MITIGATION

7.6.1 In the absence of mitigation, it is predicted that there will be no significant effects for any of the IEFs. However, a range of IEF habitats and species have been assessed as being potentially affected by the construction, operation or decommissioning of the proposed Paul's Hill II development. In order to reflect the good practice already

[40] DEFRA (2016), Understanding the Risk to European Protected Species (bats) at Onshore Wind Turbine Sites to inform Risk Management. University of Exeter.

established on the existing Pauls Hill Wind Farm, additional embedded mitigation measures have been proposed to further reduce the potential effects on these IEFs.

Mitigation by Design (Embedded Mitigation)

7.6.2 During the design process, several aspects were taken into consideration in order to minimise the potential risk to species and habitats arising from the proposed wind farm development. See Chapter 3: Site Selection and Design Evolution of the ES for detail on the overall Paul's Hill II Wind Farm design process.

7.6.3 In order to minimise land take and potential impacts on habitats and protected species, use of existing access tracks for the operational Paul's Hill Wind Farm is proposed where possible. At the current time, no additional land take is expected where use of or upgrading of existing access tracks are incorporated as part of the design, subject to a turbine model being selected and final detail being provided in the CMS. A minimum distance of 50 m has been maintained between the proposed infrastructure and watercourses where possible, with the exception of three new watercourse crossings. The watercourse crossings required for Paul's Hill II Wind Farm will be designed in keeping with SEPA good practice[41], (see Chapter 10: Hydrology, Geology and Hydrogeological Assessment).

7.6.4 The layout of the turbines, access track and associated infrastructure has avoided sensitive habitats where possible (i.e. blanket and modified bog), and areas of deepest peat and peat slide hazard zones, taking into account other constraints. Where avoidance has not been possible, the access infrastructure will be constructed in such a way as to ensure the integrity and connectivity of the hydrology of sensitive habitats will be maintained. Access tracks will be designed in keeping with SNH good practice guidance Constructed Tracks in the Scottish Uplands[42]. Further detail is provided in Chapter 10: Hydrology, Geology and Hydrogeological Assessment and supported by Figures 10.4 and 10.12.

7.6.5 In order to minimise impacts of turbines to bats during the operational phase of the proposed wind farm development, turbines have been located in open habitats at least 100 m from natural watercourses which may be used by commuting bats. Following Natural England guidance, the minimum distance which should be maintained between any potential bat foraging and commuting feature and proposed turbine location is 79 m[10], assuming a height of 20 m for Scots pine along water courses. Most Scot's pine trees checked for bat roosts within 200 m of turbine locations in the bat roost assessment (see Technical Appendix 7.2 were stunted and generally below 10 m in height but within the gully of the Caochan Liath trees were up to 10-12 m in height, with the majority being 6-7 m. 20 m is therefore precautionary and has been used as it is the height of most of the largest Scot's pine trees in pinewood remnants in Scotland[43], and will ensure that in the long term as trees mature the risk of impact to bat populations is minimised.

7.6.6 Where infrastructure is located in GWDTE's it will be designed to maintain hydrological connectivity in the surrounding habitat for example through the use of cross drains and/or waterbars. Further details on design methods to mitigate potential impacts on GWDTE's are discussed in Chapter 10: Hydrology, Geology and Hydrogeological Assessment.

7.6.7 The underground electrical infrastructure cabling route for Paul's Hill II Wind Farm will be installed under or alongside the existing access tracks in order to minimise habitat loss. Further details on design methods to mitigate potential impacts on watercourses and groundwater are discussed further in Chapter 10: Hydrology, Geology and Hydrogeological Assessment. Details on the design of access infrastructure are included in Chapter 4: Description of Development.

Habitat Management Plan

7.6.8 In line with current arrangements on the existing Pauls Hill Wind Farm, a Habitat Management Plan (HMP) for Paul's Hill II Wind Farm will be provided, subject to consultation with the landowner, SNH, and The Moray Council (TMC). Whilst this is not necesarily expected to extend the extent of the Moorland Management Plan (MMP) in area terms, it is proposed that this will be complementary to the existing MMP for the operational Paul's Hill Wind Farm and will extend the duration and integrity of the MMP to the life of the proposed wind farm development.

7.6.9 As the blanket bog within the Paul's Hill II Development Area has no obvious areas of extensive drainage, there are limited opportunities for blanket bog restoration. However, any potential for blanket bog restoration across the ownership boundary will be explored such as gully blocking to enhance and extend the life of the existing bog restoration area within the MMP for the existing Paul's Hill Wind Farm. Potential for bog restoration measures by gully blocking south of existing bog restoration area have recently been noted by contractors installing and/or replacing ditch blocking dams in November 2017.

7.6.10 The HMP will however continue to promote the current upland heath habitat management, to further support the upland breeding bird assemblage (see Chapter 8: Ornithological Assessment). It is envisaged that this could be secured and implemented through similar conditions and arrangements to those already in place for the existing Pauls Hill Wind Farm.

Construction

Pre-commencement Mitigation Measures

7.6.11 Prior to commencement of works at Paul's Hill II Wind Farm, pre-construction surveys will be carried out. These will include:

- Ecological survey of the turbine delivery route and grid route to the substation at Glenfarclas (see Figure 1.3) and any subsequent protected species surveys required including a check of all riparian habitat for otter; and
- Pre-construction fish, macroinvertebrate and water quality surveys.

This will enable any refinements to be made if necessary to mitigation, micrositing and/or the construction programme to take into account any updated distribution or presence of protected species.

7.6.12 All relevant mitigation measures would be implemented through a Construction Environmental Management Plan (CEMP), which will agreed with the local planning authority (LPA) in consultation with SNH and SEPA.

Embedded Mitigation Measures during Construction

7.6.13 A specific Construction Environmental Management Plan (CEMP) will ensure that best practice measures are implemented in order to prevent or minimise effects on sensitive habitats and species. This will prevent alterations to the drainage of mire and flush habitats, and will also contain information regarding handling and storage of peat on site, as well as its restoration and aftercare; further details are provided in Chapter 10: Hydrology, Geology and Hydrogeological Assessment.

7.6.14 The details for protecting watercourses/waterbodies are outlined in Chapter 10: Hydrology, Geology and Hydrogeological Assessment, and include a buffer zone 50 m from the turbine and associated infrastructure and mechanisms to absorb any silt or other particulate loading of the freshwater systems. A Pollution Incident Response Plan will be created to minimise potential pollution effects. Monitoring of water quality will also be carried out during construction. These measures will ensure that the habitat and water quality are maintained.

[41] SEPA, 2010. Engineering in the water environment: good practice guide - river crossings (2nd Edition), SEPA

[42] SNH, 2013. Constructed tracks in the Scottish Uplands. Available at: http://www.snh.org.uk/pdfs/publications/heritagemanagement/constructedtracks.pdf

[43] Trees for Life website, https://treesforlife.org.uk/forest/scots-pine/, Last accessed 19 December 2017

7.6.15 In order to prevent sediment laden runoff from construction plant movement from directly entering watercourses, silt fences and straw bales and/or silt traps will be installed within the site drainage system and the watercourse crossing will be designed with edge upstands or bunds, e.g. silt fences. These measures will be adopted to reduce potential water contamination/siltation which could, in turn, affect protected species both on site and downstream, notably Atlantic salmon and other aquatic species.

7.6.16 An Ecological Clerk of Works (ECoW) will be present on site to oversee enabling works and construction. They will be a suitably experienced individual, whose role should be to ensure that works are carried out in accordance with the Construction Method Statement (CMS) and the CEMP and to ensure compliance with legislation (See 'Legislation and Guidance' above). They should also review results of protected species searches prior to commencement of works in different areas within the site and contribute to all relevant CMS documents. Once work has commenced, their role should be to work on site providing ecological, pollution control advice, water quality monitoring and supervision for all relevant mitigation measures (see also Chapter 10: Hydrology, Geology and Hydrogeological Assessment). The ECoW will have the authority to stop any construction activity that is having or likely to have a significant environmental impact.

7.6.17 The ECoW will ensure that any micrositing of infrastructure during construction does not impact on the most sensitive habitats and any other identified ecological constraints. This is particularly important when working in close proximity to waterbodies and sensitive habitats such as GWDTE or blanket bog. Micrositing will be used within a maximum limit of deviation of 50 m where it does not affect other constraints. Where micro-siting cannot avoid areas of sensitive habitats or features, the ECoW will discuss and agree additional required mitigation to ensure impacts are minimised.

7.6.18 Contractors should be made aware of the ecological sensitivities on site through regular toolbox talks, including the presence of European and nationally protected species and habitats. Contractors should report any signs or sightings of protected species to the ECoW in the event any ecological interests are observed within the area of works (see also Chapter 8: Ornithology Assessment).

7.6.19 The pre-construction quality of watercourses and waterbodies will be maintained during construction and post construction (see Chapter 10: Hydrology, Geology and Hydrogeological Assessment). Watercourse protection measures will include the safe storage of chemicals in bunded containers. Refuelling of vehicles and machinery will be carried out at a central designated area, on an impermeable surface, located at least 50 m away from any watercourse. Monitoring of water quality will be carried out during construction. The implementation of these measures will ensure impacts on protected species such as fish species are minimised. Further details are included in Chapter 10: Hydrology, Geology and Hydrogeological Assessment.

7.6.20 Best practice measures will be implemented during the construction and upgrade of the three watercourse crossings (i.e. culverts) such as ensuring no building materials block passage of protected species such as otter along a watercourse (see Chapter 10: Hydrology, Geology and Hydrogeological Assessment for further detail). A watching brief during construction may also be required by the ECoW to ensure impacts on protected species are minimised. Should further mitigation be required, the ECoW will be responsible for contacting SNH and the local planning authority to discuss specific mitigation measures.

7.6.21 Any land degraded by construction and not required for the operation of Paul's Hill II Wind Farm will be restored after construction is completed, such as the construction compound, around areas of tracks, crane pads borrow pits and turbine bases. Turfs from Paul's Hill II Wind Farm will be recovered during construction as far as practicable, and stored following best practice[44] for re-use in the restoration of areas not required for the operation of Paul's Hill II Wind Farm. As such any vegetation removed for the construction phase will be reinstated within the site boundary, allowing natural re-colonisation of vegetation communities. Permanent habitat loss will be limited to that required for the footprint of infrastructure for Paul's Hill II Wind Farm, and best site management practices will be implemented on site to minimise the risk of encroachment of the construction corridor into adjacent habitats.

7.6.22 Measures to control the impact of dust on sensitive habitats will be implemented during the preparation and construction phase. These measures will be adopted when necessary, in dry weather, in areas of active development, and will most likely involve the controlled damping of tracks utilised by construction vehicles. In addition, materials for construction such as stone will be sourced as much as possible from on-site borrow pits, which will ensure the composition of materials used within Paul's Hill II Wind Farm is as close to the local conditions as possible. Further detail on the mitigation of potential dust impacts will be included within the CEMP.

7.6.23 To prevent accidental mortality of protected species during construction, deep excavations, foundations and pipe openings etc. should be covered when not active to prevent entrapment of animals, or alternatively a temporary ramp installed to enable them to exit any steep-sided excavation. In addition, a speed limit of 15 mph will be enforced for any vehicle within Paul's Hill II Wind Farm to reduce the risk of collision with protected species.

Bats

7.6.24 Pre-construction surveys of potential bat roosts should be carried out of any trees or structures with potential to support roosting bats within a minimum of 30m of working areas. This should include any tree clearance or bridge strengthening works on the turbine delivery access route and the grid route to the substation at Glenfarclas.

7.6.25 If required an application for a European Protected Species (EPS) licence submitted to SNH.

7.6.26 If construction work is carried out during the hours of darkness in the vicinity of roosts no lighting will be utilised within an hour (before and after) dusk and dawn as a minimum. Specifically, in terms of impacts on bats, no artificial lighting will be installed along or within 20 m of any edge feature.

Fish

7.6.27 In order to obtain up-to-date baseline and pre-construction information regarding the status of fish populations, and to determine quantitative information on any effect of construction on the River Spey fish population, electrofishing surveys will be carried out along watercourses draining Paul's Hill II Wind Farm. Macro-invertebrate monitoring will also be undertaken to establish water quality information (using biological indicator species) to assess the health of the watercourse ecosystems which drain Paul's Hill II Wind Farm. This monitoring programme will run alongside the pre-construction and construction water quality monitoring detailed in Chapter 10: Hydrology, Geology and Hydrogeological Assessment which includes assessments of turbidity levels and chemical indicators of pollution as well as biological indicators.

7.6.28 A comprehensive Fish and Macro-Invertebrate Monitoring Programme (FMP) will be produced in consultation with SFB to monitor the watercourses and the species that depend on them. The monitoring will commence during the pre-construction phase and continue during the period of construction of Paul's Hill II Wind Farm. The requirement for operational monitoring will be determined following completion of the pre-construction and construction monitoring.

Operation

7.6.29 With the exception of the operation of the wind turbines and general maintenance of the turbines, there will be little on-site activity during the operational phase and therefore embedded mitigation requirements during operation are minimal.

7.6.30 Where potential effects exist, construction phase control measures will continue during the operational phase. In particular, the potential for pollution incidents during routine maintenance activities or turbine malfunction will be minimised by adoption of SEPA best practice guidance (see Chapter 10: Hydrology, Geology and Hydrogeological Assessment). Vehicles coming on site will be checked for oil leaks to avoid the risk of pollution.

[44] Scottish Renewables, SNH, SEPA, Forestry Commission, 2013. Good practice during Wind Farm Construction. 2nd edition

7.6.31 Permanent features of the Paul's Hill II Wind Farm, which include seven wind turbines, crane pads and permanent access tracks, are not predicted to have any continuing effects on the ecological features once they have been completed during the construction phase, and the areas surrounding these will be reinstated using turfs recovered during the construction phase, following best practice guidance[41]. However, regular monitoring of runoff control (i.e. silt traps) and erosion control will be carried out (see Chapter 10: Hydrology, Geology and Hydrogeological Assessment for further details).

7.6.32 Any routine maintenance works will where practically possible take place during the day to minimise the potential for disturbance to protected species on site (since these are mostly nocturnal) and a speed limit of 15 mph will be enforced for any vehicle going on site, in order to reduce the risk of collision with protected species.

7.6.33 Areas of open-ground around turbines will be managed to ensure that they remain free of tree and tall shrub growth in order to maintain a 50 m buffer between potential bat features and the rotor blade tips.

Decommissioning

7.6.34 Best practice measures as described in the construction stage will be followed including specific best practice guidance for the restoration and decommissioning of wind farms[45]. New guidance available at the decommissioning phase will be adopted if appropriate.

7.7 RESIDUAL EFFECTS

7.7.1 Even in the absence of mitigation, it is predicted that there will be no significant effects for all the IEFs. Embedded mitigation measures are expected to reduce the magnitude of residual effects for all IEFs to which they apply, in the short and long-term. Further details are provided in Table 7.17 below.

7.8 SUMMARY OF EFFECTS

7.8.1 It is expected that embedded mitigation measures will protect potentially highly dependent GWDTEs during the construction phase of Paul's Hill II Wind Farm, as required by the WFD. By applying effective embedded mitigation measures, mainly through the design process and following best practice guidelines during construction, the magnitude of residual effects has been reduced to negligible for all IEFs and highly dependent GWDTEs.

7.8.2 The magnitude of pre-mitigation effects and the magnitude and significance of residual effects on each IEF during the construction phase and operation before and after mitigation is detailed in Table 7.17 below.

7.8.3 Adoption of similar habitat management measures to those already employed on the existing operational Pauls Hill Wind Farm provide an opportunity to continue to promote the current good practice for the duration of the proposed development.

Table 7.17: Summary of the level of significance of potential effects on IEFs and residual effects following mitigation

IEF	Conservation Value within Paul's Hill II Wind Farm	Nature of potential pre-mitigation effect	Magnitude of pre-mitigation effect	Significance of pre-mitigation effect	Embedded mitigation measures	Magnitude of residual effect	Residual significance	Level of certainty/comments
Construction and Decommissioning Impacts								
Designated Sites								
River Spey SAC	International	Hydrological effects via the upper tributaries; risk of water pollution incidents, run-off and erosion affecting watercourses downstream.	Moderate Negative	Not Significant	• Pre-construction and construction fish and macro-invertebrate monitoring programme and water quality monitoring (see Chapter 10: Hydrology, Geology and Hydrogeological Assessment). Mitigation by design, including: • Minimum buffer of 50 m between proposed infrastructure and watercourses where possible, with exception of construction of three watercourse crossings; • Watercourse crossings to be designed in keeping with SEPA good practice[41]; Best practice during construction, including: • Keeping within clearly defined construction areas; • Implementation of a pollution incidence response plan, through the CMS and CEMP (see Chapter 4: Project Description); • Use of suitable storage areas for materials; • ECoW presence during construction; and	Negligible	Not Significant	The SAC is situated approximately 1700 m from the nearest turbine while the SSSI is located just over 4 km from the nearest turbine. The nearest infrastructure (access track for turbine delivery and grid route to substation at Glenfarclas) crosses over the River Spey SAC and SSSI at Blacksboat Bridge. Mitigation measures will minimise the potential for significant effects. Fish, macro-invertebrate and water quality monitoring (see Chapter 10: Hydrology, Geology and Hydrogeological Assessment) prior to and during construction will determine any impacts of construction on the local water environment, and allow measures to be implemented should a pollution incident occur. A measurable residual adverse effect at an international or national level is unlikely.
River Spey SSSI	National	Geographical separation of River Spey SSSI and the nearest infrastructure suggests impacts unlikely	Moderate Negative	Not Significant		Negligible	Not Significant	

[45] Welstead, J., Hirst, R., Keogh, D., Robb G. and Bainsfair, R. 2013. Research and guidance on restoration and decommissioning of onshore wind farms. Scottish Natural Heritage Commissioned Report No. 591

IEF	Conservation Value within Paul's Hill II Wind Farm	Nature of potential pre-mitigation effect	Magnitude of pre-mitigation effect	Significance of pre-mitigation effect	Embedded mitigation measures	Magnitude of residual effect	Residual significance	Level of certainty/comments
					• For further detail on mitigation of impacts on watercourses see Chapter 10: Hydrology, Geology and Hydrogeological Assessment.			
Habitats								
Semi-natural coniferous woodland	Local	Loss of habitat: 0.005 ha (1.947%) of semi-natural coniferous woodland; and impacts from dust.	Negligible	Not Significant	Mitigation by design, including: • Use of existing access tracks where possible to minimise land take and impacts on habitats. Best practice measures during construction including: • Keeping within clearly defined construction areas; • Use of suitable storage areas for materials; and • Dust control measures.	Negligible	Not Significant	Mitigation measures will minimise impact on this habitat type and risk of impacts from dust. A measurable effect at a local level is unlikely.
Scattered trees - coniferous	Local	Loss of habitat: 0.130 ha blanket bog with scattered trees; Less than 0.001 ha of dry modified bog with scattered trees; and impacts from dust.	Negligible	Not Significant	Mitigation by design, including: • Use of existing access tracks where possible to minimise land take and impacts on habitats. Best practice measures during construction including: • Keeping within clearly defined construction areas; • Use of suitable storage areas for materials; and • Dust control measures.	Negligible	Not Significant	Mitigation measures will minimise impact on this habitat type and risk of impacts from dust. A measurable effect at a local level is unlikely.
Dry dwarf shrub heath – acid (D.1)	Local	Loss of habitat: 0.070 ha (1.043%) of dry heath; and impacts from dust	Minor Negative	Not Significant	Mitigation by design, including: • Use of existing access tracks where possible to minimise land take and impacts on habitats. Best practice measures during construction including: • Keeping within clearly defined construction areas; • Use of suitable storage areas for materials; and • Dust control measures. Habitat Management Plan such as heather and grazing management to promote and enhance upland heath habitat (See 'Habitat Management Plan' above).	Negligible	Not Significant	Mitigation measures will minimise impact on this habitat type and risk of impacts from dust. A measurable effect at a local level is unlikely.
Wet dwarf heath (D2)	Local	Impacts from dust; and Indirect hydrological effects.	Minor Negative	Not Significant	Mitigation by design, including: • Design of infrastructure to maintain hydrological connectivity in the surrounding habitat, through the use of cross drains and/or waterbars; • Use of existing access tracks where possible to minimise land take and impacts on habitats; • Access tracks will be designed in keeping with SNH good practice Constructed Tracks in the Scottish Uplands[42]. Best practice measures, including: • Keeping within clearly defined construction areas;	Negligible	Not Significant	No loss of this habitat will occur as a result of preparation and construction. Mitigation measures will minimise hydrological impacts and risk of impacts from dust. A measurable effect at a local level is unlikely.

IEF	Conservation Value within Paul's Hill II Wind Farm	Nature of potential pre-mitigation effect	Magnitude of pre-mitigation effect	Significance of pre-mitigation effect	Embedded mitigation measures	Magnitude of residual effect	Residual significance	Level of certainty/comments
					• Implementation of a pollution prevention measures (see Chapter 10: Hydrology, Geology and Hydrogeological Assessment); • Use of suitable storage areas for materials; and • Dust control measures. Habitat Management Plan such as heather and grazing management to promote and enhance upland heath habitat (See 'Habitat Management Plan' above).			
Lichen/Bryophyte heath (D3)	Local	Impacts from dust	Moderate Negative	Not Significant	Mitigation by design, including: • Use of existing access tracks where possible to minimise land take and impacts on habitats; • Access tracks will be designed in keeping with SNH good practice Constructed Tracks in the Scottish Uplands[42]. Best practice measures, including: • Keeping within clearly defined construction areas; • Implementation of a pollution prevention measures (see Chapter 10: Hydrology, Geology and Hydrogeological Assessment); • Use of suitable storage areas for materials; and • Dust control measures. Habitat Management Plan such as heather and grazing management to promote and enhance upland heath habitat (See 'Habitat Management Plan' above).	Negligible	Not Significant	No loss of this habitat will occur as a result of preparation and construction. Mitigation measures will minimise risk of impacts from dust. A measurable effect at a local level is unlikely.
Blanket bog (E1.6.1)	Regional	Loss of habitat 2.952 ha (2.457%) of blanket bog and 0.130 ha (34.917%) of blanket bog with scattered trees; Indirect hydrological effects; and impacts from dust.	Moderate Negative	Not Significant	Mitigation by design including: • The layout of turbines, access track and associated infrastructure has minimised impact on blanket bog where possible; and • Design of infrastructure to maintain hydrological connectivity in the surrounding habitat, through the use of cross drains and/or waterbars (See Chapter 10: Hydrology, Geology and Hydrogeological Assessment); • Use of existing access tracks where possible to minimise land take and impacts on habitats; • Access tracks will be designed in keeping with SNH good practice Constructed Tracks in the Scottish Uplands[42]. Best practice measures, including:	Negligible	Not Significant	Mitigation measures will minimise hydrological impacts and risk of impacts from dust. A measurable effect at a regional level is unlikely.

IEF	Conservation Value within Paul's Hill II Wind Farm	Nature of potential pre-mitigation effect	Magnitude of pre-mitigation effect	Significance of pre-mitigation effect	Embedded mitigation measures	Magnitude of residual effect	Residual significance	Level of certainty/comments
					• Keeping within clearly defined construction areas; • Implementation of a pollution prevention measures (see Chapter 10: Hydrology, Geology and Hydrogeological Assessment); • Use of suitable storage areas for materials; and • Dust control measures. Habitat Management Plan such as investigating the potential for bog restoration (See 'Habitat Management Plan' above).			
Dry modified bog (E1.8)	Local	Loss of habitat 1.030 ha (11.721%) of dry modified bog and less than 0.001 ha of dry modified bog with scattered conifer trees; Indirect hydrological effects; and impacts from dust.	Moderate Negative	Not Significant	Mitigation by design including: • The layout of turbines, access track and associated infrastructure has minimised impact on dry modified where possible; • Design of infrastructure to maintain hydrological connectivity in the surrounding habitat, through the use of cross drains and/or waterbars; • Use of existing access tracks where possible to minimise land take and impacts on habitats; and • Access tracks will be designed in keeping with SNH good practice Constructed Tracks in the Scottish Uplands[42]. Best practice measures, including: • Keeping within clearly defined construction areas; • Implementation of a pollution prevention measures (see Chapter 10: Hydrology, Geology and Hydrogeological Assessment); • Use of suitable storage areas for materials; and • Dust control measures. Habitat Management Plan such as investigating the potential for bog restoration (See 'Habitat Management Plan' above).	Negligible	Not Significant	Mitigation measures will minimise hydrological impacts and risk of impacts from dust. A measurable effect at a local level is unlikely.
GWDTEs	Local	Indirect hydrological effects	Moderately dependent – Low Negative Highly dependent – High Negative	Not Significant Protection required as specified by the WFD	Mitigation by design including • The layout of turbines, access tracks and associated infrastructure has minimised impact on GWDTEs where possible; • Design of infrastructure to maintain hydrological connectivity in the surrounding habitat, through the use of cross drains and/or waterbars; • Use of existing access tracks where possible to minimise land take and impacts on habitats; and	Negligible	Not Significant	Mitigation measures will minimise hydrological impacts. A measurable effect at a local level is unlikely.

IEF	Conservation Value within Paul's Hill II Wind Farm	Nature of potential pre-mitigation effect	Magnitude of pre-mitigation effect	Significance of pre-mitigation effect	Embedded mitigation measures	Magnitude of residual effect	Residual significance	Level of certainty/comments
					• Access tracks will be designed in keeping with SNH good practice Constructed Tracks in the Scottish Uplands[42]. Best practice measures, including: • Keeping within clearly defined construction areas; • Implementation of pollution prevention measures (see Chapter 10: Hydrology, Geology and Hydrogeological Assessment); • Implementation of a pollution incidence response plan, through the CMS and CEMP; • Use of suitable storage areas for materials; • ECoW presence during construction; and • Use of suitable storage areas for materials.			
Standing water (G1)	Local	Indirect hydrological effects through groundwater; and impacts from dust.	Moderate Negative	Not Significant	Mitigation by design including: • The layout of turbines, access track and associated infrastructure has minimised impact on standing water where possible; and • Design of infrastructure to maintain hydrological connectivity in the surrounding habitat, through the use of cross drains and/or waterbars; • Use of existing access tracks where possible to minimise land take and impacts on habitats; • Access tracks will be designed in keeping with SNH good practice Constructed Tracks in the Scottish Uplands[42]. Best practice measures, including: • Keeping within clearly defined construction areas; • Implementation of a pollution prevention measures (see Chapter 10: Hydrology, Geology and Hydrogeological Assessment); • Use of suitable storage areas for materials; • Dust control measures.	Negligible	Not Significant	Mitigation measures will minimise hydrological impacts and risk of impacts from dust. A measurable effect at a local level is unlikely.
Running water (G2)	Regional	Three new watercourse crossings; Hydrological effects such as reduced hydraulic capacity; Risk of sedimentation and erosion; and Risk of impacts from potential water pollution incidents.	Moderate Negative	Not Significant	Mitigation by design, including: • Minimum buffer of 50 m between proposed infrastructure and watercourses where possible, with exception of the construction of three watercourse crossings; • Use of existing access tracks where possible; and • Watercourse crossings to be designed in keeping with SEPA good practice[41];	Negligible	Not Significant	Watercourse crossings will be designed in keeping with best practice. Mitigation measures will minimise risk of sedimentation, erosion and risk of impacts from pollution incidents. A measurable effect at a regional level is unlikely.

IEF	Conservation Value within Paul's Hill II Wind Farm	Nature of potential pre-mitigation effect	Magnitude of pre-mitigation effect	Significance of pre-mitigation effect	Embedded mitigation measures	Magnitude of residual effect	Residual significance	Level of certainty/comments
					Best practice during construction, including: • Implementation of a pollution incidence response plan, through the CMS and CEMP; • Use of suitable storage areas for materials; • ECoW presence during construction; and • Monitoring of water quality will also be carried out during construction. For further detail on mitigation of impacts on watercourses see Chapter 10: Hydrology, Geology and Hydrogeological Assessment.			
Species								
Fish	National	Contamination of watercourses via sediment, run-off or pollution event.	Moderate Negative	Not Significant	• Pre-construction and construction fish monitoring programme; • Best practice during design of watercourse crossings; • 50 m buffer maintained between proposed infrastructure and watercourses where possible; • Protection of watercourses and water quality (see Chapter 10: Hydrology, Geology and Hydrogeological Assessment).	Negligible	Not Significant	Mitigation measures will minimise the potential for significant effects. Fish, macro-invertebrate and water quality monitoring (see Chapter 10: Hydrology, Geology and Hydrogeological Assessment) prior to and during construction will determine any impacts of construction on fish populations, and allow measures to be implemented should a pollution incident occur. A measurable residual negative effect at a regional level is unlikely.
Bats	Roost sites – Local Foraging and commuting habitat – Local	Disturbance to bat roost; and Disturbance to commuting and foraging bats.	Roost sites – Negligible Foraging and Commuting habitat – Minor Negative	Not Significant Not Significant	• Pre-construction surveys for potential bat roost sites within 30 m of infrastructure, along turbine delivery route from the A95 at Marypark and grid route to substation at Glenfarclas; • Application for EPS licence may be required to disturb bat roost during construction (to be discussed in consultation with SNH); and • Minimum buffer of 200 m between turbine locations and watercourses[46,10].	Negligible	Not Significant	Soprano and common pipistrelle were the most frequently recorded species within Paul's Hill II Wind Farm, but overall bat activity was low especially in the open habitats. A measurable residual effect at a local level is unlikely. If a bat roost is located during pre-construction survey, a EPS licence may be required to allow disturbance to the bat roost during preparation and construction works, which will be discussed with SNH prior to construction.
Operational Effects								
Designated Sites								
River Spey SAC/SSSI	International / National	Hydrological effects via the upper tributaries of Allt Arder and Allt a'Gheallaidh.	Minor Negative	Not significant	• Continued run-off management and erosion control; and • Check of maintenance vehicles for oil leaks to avoid risk of pollution incident.	Negligible	Not Significant	Mitigation measures will minimise the potential for significant effects. A measurable residual negative effect at an international or national level is highly unlikely.
Habitats								
Habitats	Local/Regional	Indirect hydrological effects;	Moderate Negative	Not significant	• Continued run-off management and erosion control;	Negligible/ potential beneficial	Not Significant	Permanent features of Paul's Hill II Wind Farm are not predicted to have any continuing effects; the areas surrounding these will be reinstated using

IEF	Conservation Value within Paul's Hill II Wind Farm	Nature of potential pre-mitigation effect	Magnitude of pre-mitigation effect	Significance of pre-mitigation effect	Embedded mitigation measures	Magnitude of residual effect	Residual significance	Level of certainty/comments
		Risk of pollution incidents; and Maintenance/repair activities causing damage to habitats.			• Proposals to enhance or maintain habitat across Paul's Hill II Wind Farm including protection and enhancement of natural and semi-natural habitats such as dry and wet heath.	impact in long term		turfs recovered during the construction phase. Habitat Management Plan has the potential to have a beneficial impact in the long term. A measurable residual negative effect at a local or regional level is highly unlikely.
Species								
Fish (Atlantic Salmon and sea lamprey)	National	Contamination of watercourses via sediment, run-off or pollution event.	Minor Negative	Not significant	• Construction phase control measures will continue during the operational phase, such as continued run-off management and erosion control.	Negligible	Not Significant	Distance between watercourses and turbine/infrastructure, and specific mitigation measures will minimise potential effects. A measurable residual negative effect at a regional level is unlikely.
Bats	Roost sites – Local Foraging habitat – Local Commuting habitat - Local	Potential risk of collision with turbines or barotrauma.	Negligible	Not significant	• Minimum buffer of 100 m between turbine locations and any water courses [10] and a minimum buffer of 200 m between T1 and T2 and the best foraging and commuting habitat within the Paul's Hill II Development Area; and • Tree and shrub control as part of habitat enhancement measures to ensure open ground surrounding turbines is maintained.	Negligible	Not Significant	Baseline bat activity surveys for Paul's Hill II Wind Farm have shown overall bat activity levels to be low especially in open habitat, with soprano and common pipistrelles being the most frequently recorded species. The only commuting and foraging habitat present at Paul's Hill II Wind Farm is a sheltered wooded gully along the Caochan Laith with higher levels of activity recorded at this location when compared to more open habitats. This wooded gully is located more than 200 m away from T1 and T2 the closest turbines. Therefore the distance maintained between turbine locations and riparian zones and more favoured foraging and commuting habitat, suggest that a significant impact is unlikely. A measurable residual negative effect at a local level is considered to be unlikely.

7.9 CUMULATIVE IMPACTS

7.9.1 The context in which cumulative effects are considered depends upon the ecology of the species or habitat in question.

7.9.2 Of species observed, bats are most likely to be affected by additional wind farm development because of the distances travelled by some species of foraging bat and the cumulative risks to bat populations as a result of barotrauma and/or collision with wind turbines during operation. Bat activity within Paul's Hill II Wind Farm was low across the open habitats, and following implementation of specific mitigation measures (such as maintaining a minimum buffer of 100 m between turbine locations and foraging and commuting habitat (watercourses, and tree and shrub control to ensure open habitat is maintained), a residual impact during operation is considered to be of negligible magnitude and not significant. With negligible residual effects predicted for all bats, these have been scoped out of the cumulative assessment.

7.9.3 There are not any IEFs for which a greater than negligible residual impact is predicted and hence, there is no real possibility of meaningful contribution to a cumulative impact with other relevant projects. Therefore, no further cumulative impact assessment has been undertaken for any of the IEFs.

7.10 STATEMENT OF SIGNIFICANCE

7.10.1 An assessment has been made of the potential for significant effects of Paul's Hill II Wind Farm on habitats and non-avian species. This assessment identified in the absence of mitigation highly dependent GWDTEs required specific mitigation measures to ensure their protection during the construction phase of Paul's Hill II Wind Farm.

7.10.2 By applying effective embedded mitigation measures, mainly through the design process, the proposed fish monitoring programme and following best practice guidelines during construction including production of a Species Protection Plan (SPP), the magnitude of residual effects of Paul's Hill II Wind Farm are assessed as being reduced to negligible in terms of magnitude, and thus not significant in terms of the EIA Regulations.

7.11 HABITAT REGULATIONS APPRAISAL (HRA)

Screening for Likely Significant Effects

7.11.1 Under the Conservation (Natural Habitats, &c.) Regulations 1994, as amended (the Habitats Regulations) any development that may have a likely significant effect (LSE) on a Special Area of Conservation (SAC), either alone or in combination with other plans or projects, requires an Appropriate Assessment (AA) to be carried out by the relevant competent authority, to determine whether the proposal will have an adverse effect on the integrity of the SAC.

7.11.2 Before AA is initiated a screening process has been undertaken to determine whether any of the predicted impacts of the proposed Paul's Hill II development will result in a LSE. This screening assessment is presented here to provide information to the competent authority to allow them to reach a decision on whether or not the proposed Paul's Hill II development will have a LSE on the River Spey SAC and therefore whether an AA is required.

7.11.3 In relation to wider works around Blacksboat Bridge and along other parts of the access route, the extent of these works are currently unknown (if indeed required), as a specific turbine model has not yet been selected. Once a turbine model has been chosen a detailed swept path analysis will be undertaken and appropriate engineering specifications will be formulated and included in the CMS. The environmental impacts of these works will be confirmed prior to construction. Whilst it is acknowledged that details of any additional works that may be required along the public access route will have to be provided at a later stage, as stated in Chapter 4: Description of Development it is assumed for the purpose of determining this application that any such works will not have an adverse effect on the River Spey SAC. Additional information on this matter will be provided as required to the planning authority and other stakeholders.

River Spey SAC

7.11.4 The River Spey SAC was designated in March 2005 and covers an area of approximately 5,729 ha and a length of approximately 776 km. It is a large Scottish east coast river that drains an extensive upland catchment and its population of Annex II species is the reason for selection of this site as an SAC.

7.11.5 The Annex II qualifying features associated with the SAC are Atlantic salmon, sea lamprey, freshwater pearl mussel and otter.

7.11.6 This SAC has the following conservation objectives:

- To avoid deterioration of the habitats of the qualifying species (listed above) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features; and
- To ensure for the qualifying species that the following are maintained in the long term:
  - Population of the species, including range of genetic types for salmon, as a viable component of the site;
  - Distribution of the species within site;
  - Distribution and extent of habitats supporting the species;
  - Structure, function and supporting processes of habitats supporting the species;
  - No significant disturbance of the species;
  - Distribution and viability of freshwater pearl mussel host species; and
  - Structure, function and supporting processes of habitats supporting freshwater pearl mussel host species.

7.11.7 The river supports one of the largest Atlantic salmon populations in Scotland, with little evidence of modification by non-native stocks. Adults spawn throughout virtually the whole length of the river, and good quality nursery habitat is found in abundance in the main river and numerous tributaries. Salmon in the Spey system are little affected by artificial barriers to migration, and the waters in the catchment are largely unpolluted (the river is oligotrophic throughout its length). For a system of its size, the Spey is also relatively free from flow modifications such as abstractions, diversions and impoundments. The salmon population includes fish of all ages including migrating smolts and returning adults, possibly reflecting genetic differences within the Spey stock[47].

7.11.8 The River Spey represents the sea lamprey in the northern part of its range in the UK. It is absent from rivers north of the Great Glen, and the River Spey is virtually at the northern limit for this species. Recent surveys show that sea lamprey larvae are widely distributed throughout the middle and lower reaches of the river, where the particularly fast-flowing waters provide ideal spawning conditions for this species. In addition, as an unpolluted and relatively little modified system, the River Spey matches the other key habitat requirements of the sea lamprey in terms of good water quality, clean gravels and marginal silts and an unhindered migration route to the sea[47].

7.11.9 The River Spey supports an outstanding freshwater pearl mussel population in its middle to lower reaches. In parts of the River Spey, extremely dense mussel colonies have been recorded (225 m^{-2}) and the total population is estimated at several million. As the population also shows evidence of recent recruitment and a high proportion of juveniles, the River Spey is considered to support a freshwater pearl mussel population of great international significance[47].

7.11.10 Surveys have identified high levels of otter presence throughout the Spey catchment and it represents an important otter site in Scotland, with good quality freshwater habitat. Riverine habitat features which are known to be important to otters are present, such as reedbeds and islands, and populations of important prey species are

[47] JNCC website http://jncc.defra.gov.uk/protectedsites/sacselection/sac.asp?EUcode=UK0019811 Last accessed 08/11/2017

relatively healthy. The persistence of a strong population of otter on this river indicates that habitat conditions are particularly favourable for the survival of this species[47].

Screening Outcome without Embedded Mitigation

7.11.11 During construction, there is potential for the construction of new infrastructure such as turbines, crane pad foundations, access tracks, watercourse crossings, temporary construction compounds, substation and the proposed borrow pits to result in the loss, disturbance or degradation of the surrounding aquatic habitats which are hydrologically linked to the River Spey SAC. There will be no direct effects on the SAC from the development of the proposed Paul's Hill II Wind Farm. As such, the only realistic pathway for effects would be water pollution leaving the site, and entering the SAC with sufficient concentration per unit volume to affect the habitats which support the qualifying features. This is highly unlikely given the distance downstream to the SAC from any proposed areas of construction and operation, but theoretically, in the absence of any embedded mitigation, it cannot be ruled out.

7.11.12 Hence, in the absence of embedded mitigation, qualifying features of the SAC could be 'at risk' of LSE arising from the proposed wind farm development, either alone or in combination with other plans or projects. However, the development will not be progressing in the absence of embedded mitigation, and the proposed embedded mitigation is outlined below.

Embedded Mitigation Measures

7.11.13 In Section 7.6, various embedded mitigation measures have been identified in order to reduce the potential level of effect on fisheries and other aquatic interests to not significant levels in terms of EIA. With the application of this mitigation, the LSE in terms of the HRA can also be reduced.

7.11.14 Embedded mitigation to be implemented for this purpose is identified below.

- A Fish Monitoring Programme (FMP) will be produced in conjunction with Spey Fisheries Board (SFB) to monitor the status of water quality and fish and macro-invertebrate populations. If successfully implemented, the FMP will also assist in determining whether significant disturbance to the qualifying species takes place during construction works. The FMP will include detailed water quality, macroinvertebrate and fish surveys prior to construction and during construction. These surveys will allow comparison of data during the pre-construction and construction phases at specific key locations to identify any risk of unpredicted changes to the integrity of the SAC, particularly in terms of the conservation objectives. Further details of the FMP will be provided in the pre-construction phase.
- Peat slides can cause damage to/deterioration of habitat and habitat fragmentation. Deeper areas of peat were identified during the initial design stage through peat surveying on the Paul's Hill II Development Area and with the completion of more detailed peat survey works undertaken specifically to provide further information on the depth, distribution and composition of the peat within the vicinity of proposed wind farm infrastructure, the potential risk of peat slide has been avoided in most parts of the proposed wind farm development. Information on the location and scale (where possible) of any relic or incipient peat instability, erosion and drainage features was collected during the course of this survey. A moderate risk of peat slides occurring has been identified in some areas of deeper peat, but this can be managed through the implementation of appropriate mitigation measures as identified in the Peat Stability Risk Assessment (see Appendix 10.2), and implementation of the Peat Management Plan (see Appendix 10.3).
- The pre-construction quality of watercourses and waterbodies will be maintained during construction and post construction (see Chapter 10: Hydrology, Geology and Hydrogeological Assessment). Watercourse protection measures will include protection against siltation and sedimentation, and pollution incidents such as the implementation of a Pollution Incidence Response Plan and the safe storage of chemicals in bunded containers. Refuelling of vehicles and machinery will be carried out at a central designated area, on an impermeable surface, located at least 50 m away from any watercourse. Monitoring of water quality will be carried out during construction. Further details are included in Chapter 10: Hydrology, Geology and Hydrogeological Assessment and water management and protection measures will be included in the CEMP.
- A Drainage Plan (provided in the CMS) will be required for the construction and operation stages to ensure that adequate drainage is provided throughout the Paul's Hill II Development Area to prevent run-off entering and polluting nearby watercourses. The Drainage Plan will set out the types of drainage to be specifically installed across the Paul's Hill II Development Area and will meet the requirements of SEPA and their GPP5 series / CAR6 guidance, along with meeting the requirements of the key fishery organisation (see Chapter 10: Hydrology, Geology and Hydrogeological Assessment);
- A CEMP will be put in place to set out the environmental requirements and procedures required in terms of water crossing installation, aquatic monitoring requirements (as set out in the FMP) and other additional requirements in relation to hydrological, peat risk assessment and other ecological monitoring including a Species Protection Plan for the turbine access and grid routes. The CEMP will be supported by a series of Construction Method Statements (CMS) for specific activities on site that may have significant effects upon the environment (e.g. construction of watercourse crossings and temporary diversions, access tracks and drainage management);
- A Pollution Incident Response Plan will be set up to identify the process for notification of a pollution incident and will provide contact details for key personnel onsite and within statutory authorities/fishing organisations. Provision of spill containing emergency equipment will also be provided on site at appropriate locations, as identified within the Pollution Incident Response Plan;
- A Peat Management Plan has been produced (see Appendix 10.3), which addresses the need to ensure that peat is managed in a sustainable manner by minimizing its excavation via the adoption of appropriate construction methods as well as the re-use of peat as part of the reinstatement works; and
- An ECoW will be appointed to ensure that all management plans and environmental legislation are adhered to. The ECoW will provide advice during the construction and instalment of water crossings to ensure that pollution is prevented as far as possible. The ECoW will also advise on the need for any temporary watercourse diversions and the best way for these to be undertaken.

7.11.15 In order to ensure these practices are adopted they could be included as planning conditions, should the development receive consent. Some appropriate conditions are suggested below, based on model planning conditions provided in BS42020. The proposed wording can easily be transposed into the planning consent, and of course is open for discussion should consultees prefer.

- Prior to commencement of works at Paul's Hill II, pre-construction ecology walkover surveys will be carried out, including a check of all riparian habitat for otters. This will enable any refinements to be made if necessary to mitigation, micrositing and/or the construction programme to take into account any updated distribution or presence of protected species, with a suitable mitigation plan adopted on a case by case basis.
- No development shall take place (including demolition, ground works, vegetation clearance) until a construction environmental management plan (CEMP), incorporating a Construction Method Statement (CMS), has been submitted to and approved in writing by the local planning authority. The CEMP shall include the following:
  - Risk assessment of potentially damaging construction activities.
  - Identification of "biodiversity protection zones".
  - Practical measures (both physical measures and sensitive working practices) to avoid or reduce impacts during construction (may be provided as a set of method statements).
  - The location and timing of sensitive works to avoid harm to biodiversity features.
  - The times during construction when specialist ecologists need to be present on site to oversee works.
  - Responsible persons and lines of communication.

- The role and responsibilities on site of an ecological clerk of works (ECoW) or similarly competent person.
- Use of protective fences, exclusion barriers and warning signs.

The approved CEMP shall be adhered to and implemented throughout the construction period strictly in accordance with the approved details, unless otherwise agreed in writing by the local planning authority.

- No development shall commence until the role and responsibilities and operations to be overseen by an appropriately competent ecological clerk of works (ECoW) have been submitted to and approved in writing by the local planning authority. The appointed person shall undertake all activities, and works shall be carried out, in accordance with the approved details. The ECoW will ensure that during construction impacts to ecological features are minimised through best practice, including ensuring water quality is maintained and the potential for disturbance or risk of injury/death is minimised for protected species which may be using the site on an occasional basis.

7.11.16 Screening for effects to qualifying features of the SAC following implementation of the above embedded mitigation, avoidance and best practice measures is included below.

Otter

7.11.17 During surveys to inform the scoping report[1], there was no evidence of otter found within the Study Area, including field signs (spraints, footprints, etc.) or places of shelter. There is limited habitat suitability for otter at the proposed wind farm development as the streams are predominantly narrow, deeply channelled and fast flowing through areas of grassy vegetation. It is unlikely otter use these on anything more than an occasional, seasonal basis for foraging and commuting. As such, there is unlikely to be direct and/or indirect impacts to otter allowing that the River Spey SAC is more than 1700 m away from the nearest infrastructure, and it is concluded that there is a **no likely significant effect** on otter. Appointment of an ECoW, and best practice measures employed during construction, such as speed restrictions, capping pipes and leaving ramps in open excavations will ensure no impacts to any protected mammal species, including otter, which may on occasion access the proposed Development Area

Atlantic Salmon

7.11.18 From the electrofishing, macroinvertebrate and water quality surveys undertaken in 2015 by The Spey Foundation and Aquaterra (Technical Appendix 7.3), it is evident that the habitat present within the Allt a' Gheallaidh and one of its tributaries (Allt a'Mhonaidh) is of good quality and suitable for supporting salmonid fish populations.

7.11.19 The presence of good populations of salmon fry within the lower reaches of the Allt a'Gheallaidh, along with a healthy and diverse macroinvertebrate (prey) community confirms that the Allt a'Gheallaidh contains important production grounds for salmon and trout and contains important spawning and juvenile habitat.

7.11.20 Historic electrofishing survey results from 2010 until 2014 indicate that salmon fry and parr are present in the watercourses Allt a'Gheallaidh and Allt Arder. The proposed development includes the construction of watercourse crossings directly within tributaries of Allt Arder and potential for pollution to enter the watercourses through events such as accidental spills or mobilisation of sediments (including potentially from peat slides). Since there is connectivity to downstream waters of the Allt a'Gheallaidh, Allt Arder and River Spey, it is considered that without the application of mitigation, it is a possible that deterioration of the habitats or disturbance to the Atlantic salmon population could take place. However, following implementation of pollution prevention measures outlined in the CEMP, Peat Management Plan, Drainage Management Plan and Pollution Incidence Response Plan, and overseen by the ECoW it is concluded that there will be **no likely significant effect** on Atlantic salmon. Fish populations and water quality will be monitored during the construction phase via the FMP.

Sea Lamprey

7.11.21 Sea lamprey have not been recorded within the Allt a'Gheallaidh and its tributary Allt a'Mhonaidh within the Fish Study Area during any of the baseline surveys, nor are they recorded as inhabiting these waters. However sea lamprey are recorded throughout the middle and lower reaches of the River Spey, where the particularly fast-flowing waters of the River Spey provide ideal spawning conditions for this species. The middle reaches of the River Spey near its confluence with the Allt Arder is more than 2 km away from the nearest infrastructure of Paul's Hill II Wind Farm. Although it is unlikely that this species will be directly affected by the proposed wind farm development, it may be possible for likely significant effects to occur as a result of habitat degradation due to pollution/sedimentation episodes further downstream in areas of more suitable habitat. However, following implementation of pollution prevention measures outlined in the CEMP, Peat Management Plan, Drainage Management Plan and Pollution Incidence Response Plan, and overseen by the ECoW it is concluded that there will be **no likely significant effect** on sea lamprey. Fish populations and water quality will be monitored during the construction phase via the FMP.

Freshwater Pearl Mussel

7.11.22 Freshwater pearl mussels are not present within the tributaries that will be directly affected by the proposed wind farm development, with the population being located further downstream within the River Spey. The nearest known colony is about 4 km from the nearest infrastructure. However, during construction, there is potential for the construction of new infrastructure such as turbines, crane pad foundations, access tracks, watercourse crossings, temporary construction compounds, substation and the proposed borrow pits to result in the loss, disturbance or degradation of the surrounding aquatic habitats. It may be possible for likely significant effects to occur as a result of the installation of watercourse crossings or through events such as accidental spills or mobilisation of sediments (including potentially from peat slides), which could affect the structure, function and supporting processes of habitats supporting freshwater pearl mussel as well as for their host species, Atlantic salmon and brown trout. However, following implementation of pollution prevention measures outlined in the CEMP, Peat Management Plan, Drainage Management Plan and Pollution Incidence Response Plan, and overseen by the ECoW it is concluded that there will be **no likely significant effect** on freshwater pearl mussel. Fish populations and water quality will be monitored during the construction phase via the FMP.

HRA Summary

7.11.23 To summarise, in the absence of embedded mitigation, there is the potential for LSE to Atlantic salmon, sea lamprey and freshwater pearl mussel and their host species (Atlantic salmon and brown trout) via indirect effects of pollution incidents, such as accidental spills or mobilisation of sediments (including potentially from peat slides), during the construction and operation phases of the proposed wind farm development. These LSE could potentially impact upon the habitats supporting the qualifying features of the SAC. With the successful implementation of all of the embedded mitigation, it is concluded that potential effects for all qualifying features of the River Spey SAC will be reduced to negligible and there will be no adverse effect resulting from this proposed wind farm development .

7.11.24 Furthermore, no cumulative impacts are predicted for any qualifying interests of the SAC as all wind farm developments of more than two turbines within 10 km of Paul's Hill II Wind Farm and within the River Spey catchment area are in the operational phase, when the risk of any LSE to the River Spey SAC's features are negligible. As a result, no LSE is predicted for the River Spey SAC as a result of the proposed Paul's Hill II Wind Farm development.

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Chapter 8

Ornithology Assessment

Contents

Note: A confidential appendix accompanies this chapter and is distributed to SNH and the RSPB only.

Glossary

Term	Definition
Baseline	The existing conditions that prevail against which the effects of the proposed Paul's Hill II development are compared.
Ecological Impact Assessment	Ecological Impact Assessment (EcIA) is a process of identifying, quantifying and evaluating potential effects of development-related or other proposed actions on habitats, species and ecosystems.
Environmental Impact Assessment Report (EIAR)	A document reporting the findings of the EIA and produced in accordance with the EIA Regulations.
Habitat	The area or environment where a species naturally occurs.
Mitigation	Measures, including any process, activity or design to avoid, reduce, remedy or compensate for potential negative effects of a development.
Protected Species	Animals or plants protected by European and/or domestic legislation.
Site of Special Scientific Interest	Sites of Special Scientific Interest (SSSIs) are protected areas that represent the UK's most important wildlife and/or geological sites.
Special Protection Area	Special Protection Area (SPA), an internationally important area for nature conservation, specifically birds, classified under the Birds Directive.
Birds of Conservation Concern	A five-yearly assessment of ornithological conservation priorities, provided by a review of the population status of birds regularly found in the UK, Channel Islands and the Isle of Man.
Scottish Biodiversity List	A list of animals, plants and habitats that Scottish Ministers consider to be of principal importance for biodiversity conservation in Scotland.

Abbreviations

Abbreviations used within this ES Chapter, and their meanings, are listed in the table below.

Abbreviation	Description
AA	Appropriate Assessment
BCS	Best Case Scenario
BoCC	Birds of Conservation Concern
BPS	Basic Payment Scheme
BTO	British Trust for Ornithology
CEMP	Construction Environmental Management Plan
CIA	Cumulative Impact Assessment
CIEEM	Chartered Institute of Ecology and Environmental Management
CRH	Collision Risk Height
CRM	Collision Risk Modelling
CRZ	Collision Risk Zone
EA	Environmental Assessment
ECU	Energy Consents Unit
ECoW	Environmental Clerk of Works
EcIA	Ecological Impact Assessment
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
ES	Environmental Statement
FORL	Fred.Olsen Renewables Ltd
HMA	Heather Management Area
HMP	Habitat Management Plan
HRSG	Highland Raptor Study Group
IOF	Important Ornithological Feature
JNCC	Joint Nature Conservation Committee
LBAP	Local (Northeast Scotland) Biodiversity Action Plan
MMP	Moorland Management Plan
Natural Power	Natural Power Consultants Limited
NESBReC	North-east Scotland Biological Records Centre
NHZ	Natural Heritage Zone
OMP	Ornithological Monitoring Plan
PAN	Planning Advice Note
RSPB	Royal Society for the Protection of Birds
SBL	Scottish Biodiversity List

Abbreviation	Description
SNH	Scottish Natural Heritage
SPA	Special Protected Area
SPP	Species Protection Plan
SSSI	Sites of Special Scientific Interest
SWBSG	Scottish Windfarm Bird Steering Group
TMC	The Moray Council
VP	Vantage Point
WCA	Wildlife and Countryside Act
WCS	Worst-case scenario
ZoI	Zone of Influence

8.1 INTRODUCTION

8.1.1 This chapter describes the ornithological interest at the proposed Paul's Hill II Wind Farm and assesses the predicted impacts of the proposed development on these interests. It details the methods used to identify the baseline bird community within the proposed Paul's Hill II development and surrounding locale, and the process used to determine the nature conservation value of the bird populations present. The chapter then sets out the potential effects of the proposed wind farm development on birds during construction, operation and decommissioning, and assesses the significance of potential impacts on bird populations, including cumulative impacts, at an appropriate bio-geographic scale. An assessment of residual impacts, taking into consideration proposed embedded mitigation measures, is also provided. Non-avian ecology is assessed in Chapter 7: Ecology, of the Environmental Impact Assessment Report (EIAR) and complements this chapter.

8.1.2 Following submission of the Scoping Report[1] and subsequent consultation, this EIAR chapter focusses only on those features which could be significantly affected by the proposed wind farm, or for which the predicted effects are currently unknown, in line with the updated Chartered Institute of Ecology and Environmental Management (CIEEM) guidelines[2].

KEY ISSUES

8.1.3 It is widely accepted that wind turbines present three main areas of potential risk to birds[3], [4]:

1. Direct habitat loss resulting from the construction of a wind farm and associated infrastructure;
2. Displacement of birds from wind farms due to disturbance during the construction and operational phases; this may be temporary or permanent. Displacement can include barrier effects in which birds alter their migration flyways or local flight paths to avoid a wind farm; and
3. Death due to collision (or interaction) with rotating turbine blades, overhead wires, guy lines and fencing. Collision risk depends on a range of factors related to the species, numbers and behaviour of birds, weather conditions and topography, and the nature of the wind farm itself, but is generally considered to be of particular relevance for sites located in areas known to support raptors or large concentrations of wildfowl.

8.1.4 These issues are considered in this assessment (Section 8.4 below).

8.1.5 The potential key ornithological issues relating to the proposed Paul's Hill II development are as follows:

- The potential for the proposed wind farm development to adversely affect the conservation status of raptor and owl species afforded the highest level of statutory protection via inclusion in Annex I of the Birds Directive and/or Schedule 1 of the Wildlife & Countryside Act 1981 (as amended);
- The potential for the proposed wind farm development to adversely affect the conservation status of breeding black grouse (*Tetrao tetrix*) or waders, through habitat loss, disturbance and displacement, and collisions with the turbines;
- The potential for the proposed wind farm development to adversely affect the conservation status of wildfowl such as geese due to the risk of turbine collisions as they fly through the area on migration or while commuting locally; and
- The potential for the proposed wind farm development to adversely affect the bird populations at local sites of international or national importance designated for their ornithological features.

Access Restrictions

8.1.6 Whilst access across the proposed turbine and infrastructure footprint was not restricted, due to land ownership restrictions it was not possible for surveyors to access survey buffers outwith the ownership boundary. As such, it

[1] Natural Power, 2017. Paul's Hill II Wind Farm Scoping Report. Document reference 1129813

[2] CIEEM. 2016. Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, 2nd Edition, January 2016.

[3] Drewitt, A.L. & Langston, R.H.W. 2006. Assessing the impacts of wind farms on birds. Ibis, 148: 29-42 (and references therein).

[4] Band, W., Madders, M. & Whitfield, D.P. 2007 Developing field and analytical methods to assess avian collision risk at wind farms. In de Lucas, M., Janss, G. & Ferrer, M. (eds.) Birds and Wind Power. Quercus, Madrid.

was not possible to survey the full recommended buffer of infrastructure for upland breeding birds, diver, black grouse, raptor and short-eared owl surveys. However, in order to cover these areas the surveyors scanned the areas outside the boundary from VPs at the edge of the ownership boundary. In this way data could be collected on, for example, displaying raptors, lekking black grouse, presence of divers, etc., in the areas beyond those accessible to surveyors. Where further access was required to verify observations on the neighbouring Tulcan Estate, access to specific areas was negotiated with the landowner.

TERMINOLOGY

8.1.7 The following areas are defined within this chapter and its appendices:

- 'The ownership boundary': the entire Paul's Hill estate, within which the existing Paul's Hill Wind Farm and the proposed extension, along with any embedded mitigation, are sited;
- 'The existing development': the original/existing Paul's Hill Wind Farm.
- 'Existing Infrastructure': all infrastructure relating to the original Paul's Hill Wind Farm.
- 'The proposed Paul's Hill II Wind Farm/the proposed wind farm development': development and construction activities associated with the proposed new Paul's Hill II Wind Farm.
- 'Paul's Hill II Development Area': the planning application area within the ownership boundary, defined by the red line boundary shown on Figure 1.3.
- 'The Study Area': the area within which ornithological baseline surveys were carried out, comprising the following:
  - Vantage Point (VP) surveys: viewsheds extended to 2.0 km from VP locations (see Figure 8.1);
  - Black grouse surveys: all suitable lekking habitat within the ownership boundary (see Figure 8.2);
  - Breeding raptor surveys: all suitable breeding habitat within the ownership boundary (see Figure 8.2);
  - Short-eared owl (*Asio flammeus*) surveys: all suitable breeding habitat within 2.0 km (access permitting) of the ownership boundary;
  - Breeding diver (*Gavia* spp.) surveys: all suitable breeding habitat within 1.0 km (access permitting) of the ownership boundary; and
  - Upland breeding bird survey: all areas of open ground within 500 m (access permitting)of the ownership boundary.
- 'Collision Risk Zone' (CRZ): this is the area derived by applying a buffer around each turbine with a radius equal to the length of the turbine blades, plus an additional precautionary 200 m.

8.1.8 The VP locations and viewsheds are shown on Figure 8.1, and ornithology survey area is shown on Figure 8.2 of the ES.

8.2 METHODS

8.2.1 A Scoping Report was issued to a wide range of consultees in September 2014[5]. In addition, consultation with Scottish Natural Heritage (SNH) regarding the ornithological assessment of the proposed Paul's Hill II Wind Farm was undertaken by Natural Power Consultants (Natural Power) in November 2014, at the SNH office in Elgin.

8.2.2 Following subsequent revisions to the proposed scheme, an updated Scoping Report was submitted for consultation in May 2017[1], presenting results for features intended to be 'scoped out' of the EIAR. All consultee responses relevant to ornithology are summarised in Table 8.1.

[5] Natural Power, 2014. Paul's Hill II Wind Farm Scoping Report. Document reference 1063033

Table 8.1: Consultation responses to scoping report (with relevance to ornithology)

CONSULTEE	RESPONSE DATE	ISSUES RAISED AND RECOMMENDATIONS	RESPONSE
SNH response to previous scoping	15/10/2014	*Agreed that the proposed survey program was appropriate. Stated that HRA would be required for Loch Spynie SPA and Moray and Nairn Coast SPA*	Superseded by 2017 scoping (below)
SNH	05/07/2017	*In addition to the Construction Environmental Management Plan (CEMP), it is recommended that an operational phase breeding bird protocol is prepared to detail what happens on site in the event of sensitive species nesting in locations where there may be operational activities.*	It is proposed to include this as part of the Ornithological Monitoring Plan (OMP); see Section 8.5.
		The ornithology chapter's summary on page 57 (see Appendix 1.1: Scoping Report) refers to the habitat management at the existing Paul's Hill wind farm. It states that the applicant envisages that this positive work will be extended through the life of Paul's Hill II. We welcome this but are not clear whether Paul's Hill II intends to deliver any additional mitigation required to address the impacts of this proposal. The raptor interest at the site is very important and the Environmental Statement (ES) should to be clear what mitigation and positive enhancement Paul's Hill II aims to achieve and how this complements that of the existing scheme.	It is proposed that a new Habitat Management Plan (HMP) will be produced to address the impacts of this proposal; see Section 8.5
		SNH agreed that impacts to the Loch Spynie SPA and Moray and Nairn Coast SPAs could be scoped out, as there is no connectivity. They also stated that they would not anticipate significant cumulative impacts on pink-footed geese.	Impacts to Loch Spynie SPA and Moray and Nairn Coast SPA have been scoped out.
Royal Society for the Protection of Birds (RSPB)	06/07/2017	*Overall the RSPB is satisfied that the proposed ornithological survey methods are appropriate.*	No response required.
		In assessing cumulative impacts on species that are sensitive to wind energy developments, it would be appropriate to consider impacts at the Natural Heritage Zone (NHZ) scale. The cumulative impact assessment should consider displacement	An assessment of species' sensitivity to wind energy developments is included in the species accounts (Section 8.4). Criteria for taking species forward for

CONSULTEE	RESPONSE DATE	ISSUES RAISED AND RECOMMENDATIONS	RESPONSE
		and barrier effects as well as collision risk. Cumulative impacts should also be considered in relation to other types of development such as overhead power lines and new woodland planting.	Cumulative Impact Assessment (CIA), and the bio-geographic scale over which these potential impacts are assessed, is discussed in Section 8.7. Information regarding disturbance/ displacement has been provided where available, and cumulative totals are expressed as minimum values to reflect the paucity of information available for other sources. Potential barrier effects are not considered since there is no indication from the data of regular movements of species likely to be susceptible to these effects[6].
		Noted that Turbine 7 will be located within an area where hen harriers Circus cyaneus have nested in recent years and where a merlin Falco columbarius territory has been recorded. It is possible that this area may be used for nesting again, if there is suitable habitat available, and the EIA and design process should ensure that the development avoids such nest sites.	This is addressed in Section 8.5.
		Turbine 1 is located within the Heather Management Area (HMA) that was agreed as part of the HMP required by a Section 75 agreement associated with the consent of the current Paul's Hill windfarm. This agreement includes a range of mitigation measures to achieve the primary aim of conserving the local hen harrier population. It is important that the aims of the HMP are not compromised by the locations of the proposed turbines or any other aspect of the development. These matters should be discussed in the environmental statement.	A new HMP will be proposed to ensure that the aims of the original HMP are not compromised, and that further measures can be put in place to conserve the local hen harrier population. See Section 8.5.
		The ES should include a clear description of the mitigation measures that are proposed to minimise potential adverse impacts, and a convincing assessment of residual impact following the deployment of these measures. There should be a commitment to post construction monitoring and to extend the life of the existing HMP to take into account the extended area and extended life of the wind farm. Evidence should be provided for the assumed effectiveness of proposed mitigation measures based on experience from other projects.	A new HMP, and an OMP will be proposed which will include proposals for post-construction monitoring and an operational phase breeding bird protocol. See Section 8.5 for details regarding proposed embedded mitigation measures including relevant references.

[6] SNH. 2012. Assessing the cumulative impact of onshore wind energy developments. Scottish Natural Heritage, Edinburgh

8.2.3 During the 2017 scoping process, with the exception of pink-footed goose (*Anser brachyrhynchus*), black grouse, hen harrier and merlin all ornithological species were scoped out of the ES, due to the absence of any potentially significant effects of the proposal on them. Changes to the prospective turbine specifications since scoping was carried out have meant that collision risk to curlew (*Numenius arquata*) has now been scoped back into the EcIA process since submission of the 2017 Scoping Report. To avoid repetition and to ensure the EIAR is proportionate and focussed only on potentially significant effects (in line with CIEEM guidance), only species-specific survey methods and results relating to these five species are included in this chapter. For further information, see the 2017 Scoping Report[1].

Legislation and Guidance

8.2.4 The ornithological baseline surveys and subsequent assessment have been carried out with reference to a number of national policy documents, as addressed in Chapter 2: Planning and Policy Context and Chapter 7: Ecology, of the EIAR. Legislative and guidance documents with relevance to ornithology are listed below:

Legislation

- Environmental Impact Assessment Directive 85/337/EEC (the EIA Directive);
- 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 Habitats Regulations), which transposes the Habitats Directive into UK law;
- The Conservation (Natural Habitats, &c.) Amendment (Scotland) Regulations 2012;
- The Conservation of Habitats and Species (Amendment) Regulations 2017, relating to reserved matters in Scotland;
- Wildlife and Countryside Act 1981 (as amended);
- The Nature Conservation (Scotland) Act 2004;
- The Wildlife and Natural Environment (Scotland) Act 2011;
- The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017; and
- Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011, which transpose the EIA Directive into the Scottish planning system.

National Policy Guidance

- Planning Advice Note (PAN) 1/2013 – Environmental Impact Assessment (Scottish Government 2013);
- PAN 51: Planning, Environmental Protection and Regulation (revised 2006);
- PAN 60: Planning for Natural Heritage (Scottish Government 2000);
- Nature Conservation: Implementation in Scotland of the Habitats and Birds Directives: Scottish Executive Circular 6/1995 as amended (June 2000);
- Planning Circular 3 2011; the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011; and
- Scottish Planning Policy.

Other Guidance

- Guidelines for EcIA in the UK and Ireland: Terrestrial, Freshwater and Coastal (CIEEM, 2016[2]);
- Recommended bird survey methods to inform impact assessment of onshore wind farms (SNH, 2014[7]);
- Birds and Wind Farms: Risk Assessment and Mitigation (de Lucas *et al.,* 2007[8]);
- Developing field and analytical methods to assess avian collision risk at wind farms (Band *et al*., 2007[4]);
- Windfarms and birds: calculating a theoretical collision risk assuming no avoidance action (SNH, 2000[9]);
- Assessing significance of impacts from onshore windfarms on birds outwith designated areas (SNH, 2006[10]);
- Monitoring the impacts of onshore wind farms on birds (SNH, 2009[11]);
- Guidance on methods for monitoring bird populations at onshore wind farms (SNH, 2009[12]);
- Use of avoidance rates in the SNH wind farm collision risk model (SNH, 2010[13]);
- Assessing the cumulative impact of onshore wind energy developments (SNH, 2012[6]);
- Avoidance rates for wintering species of geese in Scotland at onshore wind farms (SNH, 2013[14]);
- Assessing connectivity with Special Protection Areas (SPAs) (SNH, 2016[15]);
- Avoidance rates for the onshore SNH wind farm collision risk model (SNH, 2017[16]);
- Wind farm proposals on afforested sites – advice on reducing suitability for hen harrier, merlin and short-eared owl (SNH, 2016[17])
- A Review of Disturbance Distances in Selected Bird Species (Ruddock & Whitfield, 2007[18])
- British Standard 42020:2013 Biodiversity – code of practice for planning and development;
- Natural Heritage Zone (NHZ) bird population estimates. Scottish Windfarm Bird Steering Group (SWBSG). Commissioned report number 1504 (Wilson *et al.* 2015[19]);
- Goose distribution in relation to SPAs in Grampian (Patterson, 2013[20]);
- Bird Monitoring Methods (Gilbert *et al*., 1998[21]);
- A method for censusing upland breeding waders (Brown & Shepherd, 1993[22])
- Raptors: A Field Guide to Survey and Monitoring (3rd edition; Hardey *et al*., 2013[23]);
- Good Practice during Wind Farm Construction (Scottish Renewables *et al*., 2010[24]);
- Birds of Conservation Concern 4: the population status of birds in the United Kingdom, Channel Islands and the Isle of Man (Eaton *et al*., 2015[25]);
- The Local Biodiversity Action Plan (LBAP)[26]; and
- Scottish Biodiversity List (SBL).

Desk Study

8.2.5 A desk study was undertaken to collate relevant survey data, public domain survey data, and to obtain historical records of protected and relevant species from within the proposed Paul's Hill II Development Area and surrounding environment. The purpose of the desk-based review was to help inform and guide the baseline ornithological field surveys and to provide context to their results. Information obtained from the desk-based review, combined with the results of the ornithological field surveys, has been used to put the populations of target bird species recorded at the proposed wind farm development into context in terms of their regional importance.

Existing Records

8.2.6 Paul's Hill II will be an extension to the operational Paul's Hill Wind Farm, which has been undergoing operational-phase ornithology monitoring since 2006, as well as baseline, pre-construction and construction phase monitoring from 2000 until 2005. In addition an Environmental Assessment (EA) was carried out across all the land within the ownership boundary in 2015, on behalf of the landowner The Ballindalloch Trust, to provide data required by the Scottish Government's 'Basic Payment Scheme' (BPS). Therefore the features of importance within the Paul's Hill II Development Area and surrounding environment are well known. This information has been used to inform the evaluation of the importance of the Paul's Hill II Development Area to ornithological features, and where relevant these results are included in the assessment of impacts.

8.2.7 This existing information has also been used to inform our understanding of the potential impacts on internationally designated sites, which would be subject to HRA screening.

[7] SNH. 2014. Recommended bird survey methods to inform impact assessment of onshore wind farms. SNH, Battleby.

[8] de Lucas, M., Janss, G. & Ferrer, M. (eds.) 2007. Birds and Wind Power. Quercus, Madrid.

[9] SNH. 2000. Windfarms and birds: calculating a theoretical collision risk assuming no avoidance action. Scottish Natural Heritage, Edinburgh.

[10] SNH. 2006. Assessing significance of impacts from onshore windfarms on birds outside designated areas. Scottish Natural Heritage, Inverness.

[11] SNH. 2009. Monitoring the impact of onshore wind farms on birds (Guidance note). Scottish Natural Heritage, Edinburgh.

[12] SNH. 2009. Guidance on methods for monitoring bird populations at onshore wind farms. Scottish Natural Heritage, Edinburgh.

[13] SNH. 2010. Use of avoidance rates in the SNH wind farm collision risk model. SNH avoidance rate information and guidance note. Scottish Natural Heritage. http://www.snh.gov.uk/docs/B721137.pdf

[14] SNH. 2013. Avoidance rates for wintering species of geese in Scotland at onshore wind farms. Scottish Natural Heritage, Edinburgh.

[15] SNH. 2016. Assessing connectivity with Special Protection Areas (SPAs) (Guidance note: Version 3). Scottish Natural Heritage, Edinburgh.

[16] SNH, 2017. Avoidance rates for the onshore SNH wind farm collision risk model. Scottish Natural Heritage, Battleby.

[17] SNH, 2016. Wind farm proposals on afforested sites – advice on reducing suitability for hen harrier, merlin and short-eared owl. Scottish Natural Heritage

[18] Ruddock, M. & Whitfield, D.P., 2007. A Review of Disturbance Distances in Selected Bird Species. A report from Natural Research (Projects) Ltd to Scottish Natural Heritage

[19] Wilson, M.W., Austin, G.E., Gillings, S. & Wernham, C.V. (2015) Natural Heritage Zone bird population estimates. SWBSG commissioned report number 1504. Pp72. Available from www.swbsg.org

[20] Patterson, I.J. 2013. Goose distribution in relation to SPAs in Grampian. Scottish Natural Heritage Commissioned Report No. 546

[21] Gilbert, G., Gibbons, D.W. & Evans, J. 1998. Bird Monitoring Methods. RSPB, Sandy.

[22] Brown, A. F. & Shepherd, K. B. 1993. A method for censusing upland breeding waders. Bird Study, 40: 189-195.

[23] Hardey, J., Crick, H., Wernham, C., Riley, H., Etheridge, B. & Thompson, D. 2013. Raptors: a field guide to survey and monitoring. 3rd Edition. The Stationery Office, Edinburgh.

[24] Scottish Renewables, Scottish Natural Heritage, Scottish Environment Protection Agency, Forestry Commission Scotland. 2010. Good practice during windfarm construction.

[25] Eaton M.A., Aebischer N.J., Brown A.F., Hearn R.D., Lock L., Musgrove A.J., Noble D.G., Stroud D.A. and Gregory R.D. 2015. Birds of Conservation Concern 4: the population status of birds in the United Kingdom, Channel Islands and Isle of Man. British Birds 108, 708–746.

[26] North East Scotland Biodiversity Partnership – Action Plan 2014 – 2017. Available at http://www.nesbiodiversity.org.uk/publications

8.2.8 To provide background information pertaining to the baseline status of protected species in the local environment, a web-based search for historical records of protected and relevant species from within the past five years was undertaken using the National Biodiversity Network (NBN) website[27]. These searches generally concentrated on a radius of 5 km around the ownership boundary, but in order to take into account the possibility of breeding golden eagle (*Aquila chrysaetos*) in the wider area a search radius of 6 km around the ownership boundary was applied for this species.

8.2.9 In addition, the following organisations were contacted in August 2015, to request any records they hold from within 5 km of the Paul's Hill ownership boundary (out to 6 km for eagles):

- North East Scotland Biological Records Centre (NESBReC);
- British Trust for Ornithology (BTO);
- Highland Raptor Study Group (HRSG); and
- RSPB.

Statutory Sites

8.2.10 A web-based search was undertaken to identify and provide information on all sites with an international or national designation for ornithological interests. This included SPAs, Ramsar sites, and Sites of Special Scientific Interest (SSSIs) within a 25 km radius of the proposed Paul's Hill II Development Area; those sites within 10-25 km of the proposed wind farm development were only considered if geese were listed as a qualifying feature. This distance was considered appropriate for geese based on published information on maximum distances travelled by wildfowl between roost sites and foraging areas (e.g. Giroux & Patterson, 1995[28]), and exceeds the core winter foraging range for pink-footed goose and greylag goose (*Anser anser*) of 15-20 km cited in SNH guidance[15]. Sites designated solely for non-avian ecological interests and of relevance to the proposed development are considered separately in Chapter 7: Ecology, of the EIAR. The following sources were accessed to obtain information on designated sites:

- Magic GIS tool[29]; and
- SNH Sitelink website[30].

Target Species

8.2.11 The ornithological surveys carried out at the proposed Paul's Hill II wind farm followed SNH guidance[7], which recommends that surveys should focus on protected species and other species of conservation concern, with reference to the following three lists:

- Species listed under Annex I of the EC Birds Directive;
- Species listed under Schedule 1 and Schedule 1A of the Wildlife and Countryside Act (WCA) 1981 (as amended); and
- Red-listed Birds of Conservation Concern (BoCC[25]).

8.2.12 In addition, SNH recommends that special consideration should also be given to species identified as being of regional and local conservation concern within the SBL and LBAPs; and any other species occurring in particularly high concentrations at a site.

8.2.13 Within these lists, SNH recommends that the greatest attention should be paid to those species which, as a result of their flight patterns or response behaviour, may be subject to impact from wind farms (such as raptors) and any species that are not particularly manoeuvrable in flight (e.g. geese and swans).

8.2.14 Potential target species for this site were informed by the results of the ornithological surveys undertaken for the existing Paul's Hill Wind Farm. These surveys have recorded flight and breeding activity of the following species within the vicinity of the proposed Paul's Hill II site:

- Breeding raptors: hen harrier, merlin, peregrine (*Falco peregrinus*), short-eared owl and barn owl (*Tyto alba*);
- Flights of hen harrier, merlin, peregrine, short-eared owl and golden eagle;
- Breeding red grouse (*Lagopus lagopus scotica*), oystercatcher (*Haematopus ostralegus*), golden plover (*Pluvialis apricaria*), curlew, snipe (*Gallinago gallinago*) and lapwing (*Vanellus vanellus*); and
- Breeding black grouse.

8.2.15 In addition, red-throated (*Gavia stellata*) and black-throated (*Gavia arctica*) divers have been recorded at the adjacent Berryburn Wind Farm and records exist for capercaillie (*Tetrao urogallus*) in the wider area.

8.2.16 In accordance with SNH guidance[7], surveys focused on the following target species:

- All raptors and owls listed in Annex I of the EC Birds Directive and/or Schedule 1 and 1A of the WCA 1981 (as amended);
- All species of swans and geese (with the exception of Canada goose [*Branta Canadensis*] and mallard [*Anas platyrhynchos*]);
- Black grouse and capercaillie;
- Divers; and
- All wader species.

8.2.17 Secondary species included the following:

- All other waterfowl (e.g. mallard and grey heron *Ardea cinerea*);
- All other raptor species;
- Raven (*Corvus corax*); and
- Any large aggregations of red-listed passerines.

Ornithological Survey Programme

8.2.18 In order to assess the potential effects of a wind farm on birds, both the value of the site itself to birds and the level of flight activity within and around the site should be determined. In view of the target species identified as potentially occurring within the proposed wind farm development, and following consultation with SNH, the surveys listed below were undertaken, in line with SNH guidance[7].

- VP surveys: March 2014 to August 2015 (inclusive);
- Black grouse lek survey: 2014 and 2015;
- Breeding raptor surveys: 2014 and 2015;
- Short-eared owl survey: 2014 and 2015;
- Breeding diver survey: 2014 and 2015; and
- Upland breeding bird survey: 2014 and 2015.

Baseline Surveys

8.2.19 A summary of each baseline ornithology survey method is provided in the 2017 Scoping Report. Species-specific survey methods for the five species which have been carried forward for EcIA are provided below. Further details

[27] https://data.nbn.org.uk/imt/#4-10.534,54.605,3.528,58.195 last accessed 13/03/2017

[28] Giroux, J-F. & Patterson, I.J. 1995. Daily movements and habitat use by radio-tagged pink-footed geese *Anser brachyrhynchus* wintering in north-east Scotland. Wildfowl 46, 31-44.

[29] http://www.magic.gov.uk/ last accessed 10/03/2017

[30] https://gateway.snh.gov.uk/sitelink/ last accessed 21/02/2017

regarding these methods, in addition to survey timings and weather conditions are provided in Appendix 8.1: Ornithology Technical Appendix.

Vantage Point Surveys: 2014-15

8.2.20 Flight activity surveys from VP locations were carried out following methods advocated by SNH guidance[7]. This method focuses on identifying flight-paths and flight heights of target species, such as wildfowl and raptors, and allows any regular patterns of flight lines to be identified, allowing turbine locations to be designed to minimise collision risk to birds. The data generated can also be used to estimate the theoretical collision risk of a particular species.

8.2.21 All incidental records of target species (i.e. birds that were not in flight, birds that were heard but not seen, birds that were observed well beyond the survey area and records outside of the formal VP surveys) were also recorded.

8.2.22 VP surveys commenced in March 2014, from the following three locations (Ordnance Survey 12-figure grid references given):

- VP 1: 310815 842356
- VP 2: 312103 840033
- VP 3: 314231 841007

8.2.23 SNH guidance[7] states that 36 hours of survey should be carried out in the breeding season and 36 hours in the non-breeding season. For most target species, these seasons are considered to be March to August (inclusive) and September to February (inclusive). However, the core raptor breeding period (which should also have 36 hours of survey effort), is April to July inclusive, other than for hen harrier for which it is April to August. Taking this into account, a minimum of 45 VP hours was undertaken at each VP location, with at least 36 hours undertaken between April and August, and additional hours undertaken in March. A summary of the monthly, seasonal and total survey effort is provided in Table 8.2 below. In addition, ongoing survey work for the existing Paul's Hill Wind Farm in 2015 included VPs specifically targeted at raptors, from a similar location to VP 2. Results of these surveys are provided in Appendix 8.2: Ornithology Confidential Appendix.

8.2.24 VP locations and viewsheds are shown in Figure 8.1.

Table 8.2: Summary of VP survey effort by month

YEAR and SEASON	MONTH	Vantage Point		
		VP 1	VP 2	VP 3
2014 Breeding season	March	6	6	6
	April	6	6	6
	May	9	9	9
	June	9	9	9
	July	9	9	9
	August	6	6	6
Total survey effort		**45**	**45**	**45**
2014/2015 Non-breeding season	September	6	6	6
	October	6	6	6
	November	6	6	6
	December	6	6	6
	January	6	6	6
	February	6	6	6
Total survey effort		**36**	**36**	**36**
2015 Breeding season	March	6	6	6
	April	9	9	9
	May	9	6.7	9
	June	8	9	3
	July	10	9	14.75
	August	6	6	6.25
Total survey effort		**48**	**45.7**	**48**

** Shaded cells represent the core breeding period for hen harrier. The core general raptor breeding period is April to July.*

Black Grouse Lek Surveys: 2014 and 2015

8.2.25 Surveys for lekking black grouse were carried out in 2014 and 2015 following the National Black Grouse Survey Instructions[31] summarised in Gilbert *et al*. (1998)[21]. All suitable black grouse habitat within the land ownership boundary was surveyed. Due to the access restrictions outwith this area (as described in Section 8.1.6), the surveyor spent time at the edge of the ownership boundary looking and listening for birds lekking in areas of suitable habitat on the surrounding ground. As surveys were undertaken in favourable weather conditions with light winds, it is considered that the audibility of displaying males will have ensured that birds lekking beyond the ownership boundary will have been detected during these surveys. All known lek sites (identified during the desk study, and from previous survey work undertaken at the original Paul's Hill Wind Farm) and other areas of suitable habitat within the ownership boundary were visited within two hours of dawn.

8.2.26 A three visit survey approach was undertaken in 2014:

- Visit 1: a site visit was undertaken to assess all habitat for black grouse suitability on 08 and 09 April 2014;
- Visit 2: areas of suitable lekking habitat, and historic lekking sites were visited (starting pre-dawn) on 28 and 29 April 2014, to establish presence/absence; and
- Visit 3: Locations where black grouse were recorded as being present during Visit 2 were revisited on 15 and 16 May 2014 in order to provide a further count of the number of males and females present. These surveys began before sunrise and lasted for around three hours.

8.2.27 In addition, six survey visits to locate active leks, and to count the number of lekking males were undertaken at the original Paul's Hill Wind Farm in 2015 for operational monitoring under the Moorland Management Plan (MMP), on the following dates: 25 and 30 March, and 09, 21, 26 and 28 April 2015.

8.2.28 It should be noted that the wind increased to Beaufort 4 in the last two hours of the last survey visit to the original Paul's Hill Wind Farm on 28 April 2015.

8.2.29 Further details of survey visits are provided in Appendix 8.1: Ornithology Technical Appendix.

Breeding Raptor Surveys: 2014 and 2015

8.2.30 To provide a comprehensive assessment of breeding raptor activity at the proposed Paul's Hill II Wind Farm, breeding raptor surveys were carried out between April and August 2014, and March and July 2015 within the ownership boundary.

[31] Etheridge, B and Baines, D (1995) Instructions for the Black Grouse Survey 1995/6: a joint RSPB/GCT/JNCC/SNH project. Unpublished.

8.2.31 Walkover surveys combined with *ad hoc* VP surveys from strategic locations were undertaken. All surveys followed the methods described in Hardey *et al*.,[23] as advocated by SNH[7], and were carried out under a Schedule 1 Licence by suitably experienced surveyors. Target species flights were recorded, along with non-flight ('point') records, onto 1:10,000 scale field maps.

8.2.32 Targets for these surveys comprised all species of raptor and owl. Observations of other notable species (such as black grouse or waders) were also recorded.

8.2.33 Further details of survey effort and weather conditions during the breeding raptor surveys are provided in Ornithological Technical Appendix 8.1.

Information Gaps

8.2.34 At Pauls Hill II, the height bands used during VP surveys were:

- (1) <18 m
- (2) 18-32 m
- (3) 32-125 m
- (4) >125 m

8.2.35 The proposed turbine models for the development changed during the scheme evolution, as such, the height bands used to record flight activity do not correspond to collision risk height (CRH) for the turbines currently proposed.

8.2.36 The layout for Paul's Hill II which was current at the time of the 2017 scoping[1] proposed turbines with a maximum tip height of 149.9 m and a blade length of 57 m, therefore giving a hub height of 92.9 m, with the exception of Turbine 6 which had a maximum tip height of 134 m and a hub height of 77 m. As such, the CRH was 35.9 m – 149.9 m, and 20 m – 134 m respectively.

8.2.37 A requirement for flexibility in choice of turbine make and model has led to a scenario where Turbines 1-7 could have CRH of 19.9 – 149.9 m (i.e. height bands 2, 3 and 4 all being at least partially at CRH), and Turbine 6 could have CRH of 12 – 134 m, meaning that all four height bands will be at least partially at CRH. It was therefore necessary to make assumptions about the distribution of flight heights recorded at the proposed Paul's Hill II Wind Farm (as detailed under Collision Risk Modelling below). This represents a precautionary approach, and this should be taken into account in any interpretation of the results.

8.2.38 Restricted access outwith the ownership boundary, as outlined in 'Access Restrictions' in Section 8.1, has resulted in data gaps for the full recommended buffer of infrastructure for black grouse (1.5 km) and raptor (2 km) surveys. It is considered that the approach adopted by surveyors to counteract this issue enabled sufficient data to be collected in order to adequately assess the importance of these areas in the context of the development.

Collision Risk Modelling

8.2.39 Collision risk modelling (CRM) is used to predict the number of individuals per target species that might collide with the wind turbine rotors. This is undertaken when sufficient flight activity occurs within the collision risk zone (CRZ) at CRH (i.e. the height at which rotor blades sweep), as per the Band *et al*.,[4] collision risk model recommended by SNH[7]. Sufficient flight activity was defined as ≥ 3 flights or ≥ 10 individuals at CRH in the CRZ. For the purposes of this EIA flights which pass through or touch a 265 m buffer of the turbines are considered to be in the CRZ.

8.2.40 As noted above, the height bands used to record flight activity do not correspond to CRH for the seven turbines currently proposed and it has therefore been necessary to make assumptions about the distribution of flight heights. In order to account for this, an 'even distribution' scenario was used in the CRM. This method assumes that all birds recorded in a given flight height band had an equal probability of flying at any height within the respective height range of each band (i.e. band 1: <18 m; band 2: 18-32 m; band 3: 32-125 m; band 4: >125 m). In addition, in order to give flexibility in choice of turbine, there are two different blade lengths and therefore hub heights proposed for each turbine (tip heights will not change) and as such we have run 'worst-case scenario' (WCS: longer blades and greater rotor swept area) and 'best-case scenario' (BCS: shorter blade length and smaller rotor swept area) models for both turbine heights using the maximum (65 m) and minimum (56 m) proposed blade lengths. See Table 8.3 below.

Table 8.3: The proportion of CRZ flights in each height band which were considered to be at CRH for the purposes of collision risk modelling, giving WCS and BCS for each turbine based on maximum and minimum likely rotor swept area.

	WCS (Turbine 1-7)	BCS (Turbine 1-7)	WCS (Turbine 6)	BCS (Turbine 6)
Height band	CRH 19.9-149.9 m	CRH 37.9-149.9	CRH 12-134	CRH 22-134
Band 4 (>125 m)	100 %	100 %	100 %	100 %
Band 3 (32-125 m)	100 %	93.7 %	100 %	100 %
Band 2 (18-32 m)	86.4 %	0 %	100 %	71.4 %
Band 1 (<18 m)	0 %	0 %	33 %	0 %

8.2.41 So in the WCS for Turbine 6, since CRH (12-134 m) accounts for 33% of the total height covered by Band 1 (up to 18 m) and 100% of the total height covered by all the other bands, this method assumes that 33% of all birds recorded within band 1 and 100% of all birds recorded within the other bands were flying at CRH. This includes 100% of all birds recorded at >125 m, which will evidently not have been the case in reality. Also, if a flight went through the buffer for Turbine 6 the risk heights for that turbine were applied to the whole flight, even if it then entered the CRZ for one of the taller turbines, so a flight in Band 1 which crossed the CRZ for Turbine 6 and then entered the CRZ for Turbine 7, would, for example, be considered to still have a 33% chance of being at CRH in the vicinity of Turbine 7. As such, very precautionary methods have been applied to account for the uncertainty, and it is expected that the true collision rate will be significantly below that predicted by even the 'best case' scenario.

8.2.42 For species that usually fly in approximately straight lines ('directional approach'), such as geese, flights observed are extrapolated up in order to estimate the number of individuals likely to pass through the CRZ at CRH per season or year. This type of analysis was carried out for pink-footed goose,

8.2.43 For species that generally fly non-directionally ('random approach'), the observed time spent flying within the risk area is calculated and similarly extrapolated up per season or year across the whole risk area. This type of analysis was used to estimate collisions for hen harrier and curlew. For random approach flights, a conservative estimate was calculated assuming that all flight at CRH represented collision risk flight. However, in practise, a large proportion of these flights occurred outside of the risk area. A second (non-conservative) analysis was therefore carried out reducing the value used for the time spent at risk height by a factor representing the proportion of each flight recorded within the collision risk area.

8.2.44 The risk of collision is then combined with a parameter representing avoidance behaviour likely to be displayed by birds flying towards turbine blades. Collision estimates were calculated based on recommended species-specific avoidance rates[32], as well as estimates using more conservative avoidance behaviour parameters.

8.2.45 For those species carried forward for EcIA from the 2017 Scoping Report[1], the number of flights and individuals recorded during the VP surveys (March 2014 to August 2015 inclusive) that passed through the CRZ are summarised in Section 8.3.

[32] SNH, 2016. Avoidance Rates for the onshore SNH Wind Farm Collision Risk Model. SNH, Battleby

Impact Assessment

8.2.46 This section summarises how the significance of effects on the ornithological interests at the proposed Paul's Hill II Wind Farm was assessed.

8.2.47 The approach used for the assessment of ornithological impacts followed the guidance produced by CIEEM[2]. These guidelines set out the process for assessment through the following stages:

- Describing the ornithological baseline in the zone of influence (ZoI) through survey and desk study.
- Identifying Important Ornithological Features (IOFs): these are the species of highest ornithological value present in the ZoI;
- Determining the nature conservation value of the IOFs present within the ZoI that may be affected by the development;
- Identifying and characterising the potential impacts on these IOFs, based on the nature of the construction, operation and decommissioning activities associated with the development;
- Determining the magnitude of the impacts including consideration of the sensitivity of the feature and the duration and reversibility of the effect;
- Determining the significance of the impacts based on the interaction between the effect magnitude/duration, the nature conservation value and the likelihood of the effect occurring. In addition, sensitivity of the feature affected is also considered for potential ornithological impacts;
- Identifying mitigation measures required to address any significant negative effects;
- Determining the residual impact significance after the effects of mitigation have been considered, including a description of any legal and policy consequences; and
- Identification of any monitoring requirements.

Evaluating Ornithological Features

8.2.48 The assessment process involves identifying IOFs. These ornithological features and their values are determined by the criteria defined in Table 8.4. It should be noted that these criteria are intended as a guide and are not definitive; professional judgement has also been applied in determining value level for IOFs.

Table 8.4: Approach to valuing ornithological features

VALUE LEVEL	EXAMPLES
International	A species listed as a qualifying feature of an internationally designated site (e.g. SPA or Ramsar wetland site). Species populations present with sufficient conservation importance to meet criteria for SPA selection. A regularly occurring, nationally important population of any internationally important species listed under Annex I of the Birds Directive, or regularly occurring migratory species listed under Annex II of the Birds Directive connected to an SPA designated for this species.
National	A species listed as a qualifying feature of a nationally designated site (e.g. SSSI). Species populations present with sufficient conservation importance to meet criteria for SSSI selection. A regularly occurring, regionally important population of any nationally important species listed under Schedule 1 of the WCA or Annex I of the Birds Directive and species listed as an SBL priority species.
Regional	A species occurring within SPAs, Ramsar sites and SSSIs, but not crucial to the integrity of the site. Species populations present falling short of SSSI selection criteria but with sufficient conservation importance to likely meet criteria for selection as a local site e.g. important in the context of SNH Natural Heritage Zone populations. A regularly occurring, locally important population of any nationally important species listed as an LBAP priority species and species listed under Schedule 1 of the Wildlife and Countryside Act or Annex I of the Birds Directive.
Local	Species described above but which are present very infrequently or in very low numbers. Other species of conservation concern, including species included on the UK BoCC Red and Amber Lists[25] .
Negligible	All other species that are widespread and common and which are not present in locally important (or greater) numbers and which are considered to be of low conservation concern (e.g. UK BoCC Green List species[25]).

8.2.49 The assessment of ornithological features recorded during the baseline surveys also considers the value of the proposed Paul's Hill II Development Area for the species under consideration, rather than only considering the nature conservation importance of the species itself. To illustrate the rationale of this approach, while pink-footed goose would be considered to be a species of international conservation importance using the criteria in Table 8.5, the value of the proposed Paul's Hill II Development Area to this species is considered limited, due to only two records of relatively small flocks being recorded during the course of 18 months of baseline surveys. Therefore, in this case, the nature conservation importance of the proposed Paul's Hill II Development Area for pink-footed goose would be assessed as being 'local'.

8.2.50 Therefore, while the importance of the species is taken into account, in order to assess the nature conservation importance of the site, the number of individuals of that species using it and the nature and level of this use is also taken into account. An assessment is then made of the importance of the proposed Paul's Hill II Development Area to the species in question.

Characterising Potential Effects on Ornithological Features

8.2.51 Effects on IOFs are judged in terms of magnitude and duration[33].

8.2.52 Magnitude refers to the size of an impact, and is determined on a quantitative basis where possible. This may relate to the area of habitat lost to the development footprint in the case of a habitat feature, or predicted loss of individuals in the case of a population of a particular species of bird. Magnitude is assessed within six levels, as detailed in Table 8.5 below.

Table 8.5: Criteria used to determine the magnitude of ecological impacts

Impact magnitude	Description
Very highly negative	Total or almost complete loss of a receptor resulting in a permanent adverse effect on the integrity of the receptor. The conservation status of the receptor would be affected.
Highly negative	Result in large-scale, permanent changes in a receptor, and likely to change its ecological integrity. These effects are therefore likely to result in overall changes in the conservation status of a receptor.

[33] Regini, K. 2000. Guidelines for ecological evaluation and impact assessment. Ecology and Environmental Management. In Practice, 29 (September), pp. 1, 3-7. Winchester, Institute of Ecology and Environmental Management.

Impact magnitude	Description
Moderately negative	Include moderate-scale long-term changes in a receptor, or larger-scale temporary changes, but the integrity of the receptor is not likely to be affected. This may mean that there are temporary changes in the conservation status of the receptor, but these are reversible and unlikely to be permanent.
Minor negative	Include effects that are small in magnitude, have small-scale temporary changes, and where integrity is not affected. These effects are unlikely to result in overall changes in the conservation status of a receptor.
Negligible	No perceptible change in the ornithological receptor.
Beneficial	The changes in the ornithological receptor are considered to be beneficial to its integrity or nature conservation status.

8.2.53 Effects and spatial magnitude are assessed within the appropriate bio-geographic regions[10]. These are detailed below:

- Effects on breeding bird populations are assessed in a regional context. The appropriate regional bio-geographic unit has been identified by SNH as the Natural Heritage Zone (NHZ). NHZ classifications represent areas with a high level of bio-geographic coherence, and are unrelated to administrative boundaries. Current NHZ population estimates are presented in Wilson *et al.*,[19].
- The proposed Paul's Hill II development lies within NHZ 10 (Central Highlands). Regional impacts are assessed within this area as far as is practicable, although reference is also made to the adjacent NHZ 21 (Moray Firth) where this is considered relevant.
- Where relevant, any potential impacts on migratory goose populations of conservation value are assessed at an international level, in context with local sites for which these species are qualifying features.

8.2.54 Duration is defined as the time for which the impact is expected to last before recovery, i.e. return to pre-construction baseline conditions[10]. This is summarised in Table 8.6 below.

Table 8.6: Criteria for describing duration

DURATION	DEFINITION
Permanent	Effects continuing indefinitely beyond the span of one human generation (taken as approximately 25 years), except where there is likely to be substantial improvement after this period (e.g. the replacement of mature trees by young trees which need > 25 years to reach maturity, or restoration of ground after removal of a development. Such exceptions are termed "very long-term effects").
Temporary	Long-term (15 - 25 years or longer; see above) Medium term (5 – 15 years) Short-term (up to 5 years)

8.2.55 Knowledge of how rapidly the population or performance of a species is likely to recover following loss or disturbance (e.g. by individuals being recruited from other populations elsewhere) is used to assess duration, where such information is available.

8.2.56 In addition, birds are assessed with consideration for their behavioural sensitivity and ability to recover from temporary negative conditions. Behavioural sensitivity is determined subjectively based on the species' ecology and behaviour, using the broad criteria set out in Table 8.7 below. The judgement takes account of information available on the responses of birds to various stimuli (e.g. predators, noise and disturbance by humans).

8.2.57 It should be noted that behavioural sensitivity can differ between similar species and between different populations of the same species. Thus the behavioural responses of birds are likely to vary with both the nature and context of the stimulus and the experience of the individual bird. Sensitivity also depends on the activity of the bird, for example, a species is likely to be less adaptable to disturbance whilst breeding than at other times. In addition, individual birds of the same species will differ in their tolerance depending on the level of human disturbance that they regularly experience in a particular area, and have become habituated to (e.g. individuals that live in an area with high human population and activity levels are likely to have a greater tolerance than those that occupy remote locations with little or no human disturbance). However, tolerance is likely to increase as breeding progresses.

Table 8.7: Behavioural sensitivity of birds

SENSITIVITY	DEFINITION
High	Species or populations occupying habitats remote from human activities, or that exhibit strong and long-lasting (guide: > 20 minutes) reactions to disturbance events.
Moderate	Species or populations that appear to be warily tolerant of human activities, or exhibit short-term reactions (guide: 5-20 minutes) to disturbance events.
Low	Species or populations occupying areas subject to frequent human activity and exhibiting mild and brief reaction (including flushing behaviour) to disturbance events.

Determining Significance of Potential Ornithological Effects

8.2.58 Having followed the process of attributing a value to an ornithological receptor, determining its sensitivity, and characterising potential effects, the significance of the effect is then determined. The CIEEM guidelines[2] use only two categories to classify effects: "significant" or "not significant". The significance of an effect is determined by considering the importance of the feature, the magnitude of the effect and applying professional judgement as to whether the integrity of the feature will be affected. This concept can be applied to both designated sites (for example, a SSSI) and to defined populations (for example a regional breeding curlew population).

8.2.59 The term integrity is used here in accordance with the definition adopted by the Office of the Deputy Prime Minister (ODPM) Circular 06/2005 on Biodiversity and Geological Conservation whereby designated site integrity refers to *"…coherence of ecological structure and function…that enables it to sustain the habitat, complex of habitats and/or levels of populations of species for which it was classified".* Integrity therefore refers to the maintenance of the conservation status of a population of a species at a specific location or geographical scale.

8.2.60 Effects are more likely to be considered significant where they affect features of higher conservation importance or where the magnitude of the effect is high. Effects not considered to be significant would be those where the integrity of the receptor is not threatened, effects on receptors of lower conservation value, or where the magnitude of the effect is low.

8.2.61 With reference to CIEEM 2016[2], paragraph 5.26 provides "A significant effect is simply an effect that is sufficiently important to require assessment and reporting so that the decision maker is adequately informed of the environmental consequences of permitting a project. A significant effect is a positive or negative ecological effect that should be given weight in judging whether to authorise a project."

8.2.62 Where appropriate, mitigation measures are identified following the recognised hierarchy of 'avoid, minimise, off-set in order to avoid, reduce and/or compensate' for potentially significant effects. This includes avoidance through the design process.

8.2.63 The significance of residual impacts on receptors after the effects of mitigation have been considered can then be determined, along with any monitoring requirements (in line with the recommendations outlined in SNH guidance[11],[12]).

8.2.64 Note that a matrix system has not been used in determining significance as the CIEEM guidelines[2] avoid and discourage the use of this approach. This guidance seeks to determine whether an effect is either significant or not significant; this is done by looking at the integrity of the wider population. The CIEEM guidance does not advocate the allocation of degrees of significance, but instead concentrates upon the effect that any impact may have upon the integrity of an affected population. Therefore, if an impact is considered to be of a scale that is unlikely to exert an effect upon the population integrity, it is considered to be not significant. The assessment includes potential impacts on each ornithological feature determined as 'important' from all phases of the Development, e.g. construction, operation and decommissioning, and considers direct, indirect, secondary and cumulative impacts and whether the impacts and their effects are short, medium, long-term, permanent, temporary, reversible, irreversible, positive and/or adverse.

8.3 RESULTS

Desk Study

8.3.1 Consultation with the RSPB, BTO and HRSG provided records of all species, including protected bird species and birds of conservation concern, within 5 km of the proposed Paul's Hill II Wind Farm. These are included in Ornithological Technical Appendix 8.1, with confidential records in Ornithological Appendix 8.2. Records are also referred to in the species accounts in Section 8.4, where relevant.

8.3.2 The data received from NESBReC contained no records of species of interest from within 5 km of the site in the last five years.

8.3.3 Extensive survey work and monitoring has been undertaken within the ownership boundary for Paul's Hill since 2001. In terms of ornithology, the principal feature of interest at the site is hen harrier, which has maintained a breeding population at Paul's Hill for at least the past 24 years. Merlin have also regularly bred at the site in the past, and there is a stable population of breeding black grouse, with at least three to four leks present in the majority of the years in which survey work has been carried out. One incidental record has also been made of a female capercaillie near Scoot More during the course of habitat surveys undertaken in 2015 for the existing wind farm.

Statutory Sites of Ornithological Importance

Sites of International Importance

8.3.4 There are no statutory sites with national or international designations for ornithological features within 10 km of the proposed Paul's Hill II Wind Farm (see Figure 8.3). One site with geese as a qualifying feature was identified within 25 km of the proposed development[34], as follows:

- Moray and Nairn Coast SPA and Ramsar site.

Due to the lack of connectivity to the proposed Paul's Hill II Wind Farm, and low numbers of goose flights recorded, SNH agreed that impacts to this (and other) SPAs could be scoped out of the EIAR.

Baseline Surveys

8.3.5 Surveys were conducted between March 2014 and August 2015 (inclusive). Results of the following surveys are considered to be of relevance to the five species scoped into the EcIA :

- Breeding season VP surveys (mid-March to August inclusive);
- Non-breeding season VP surveys (September to mid-March, inclusive);
- Breeding raptor surveys; and
- Black grouse surveys.

8.3.6 Further details are provided in Ornithological Technical Appendix 8.1. Confidential records are described in Ornithological Appendix 8.2.

VP Surveys

2014 Breeding season

8.3.7 Species recorded during the first breeding season of VP surveys (March to August 2014, inclusive) are shown in Table 8.8 below, and on Figure 8.4 and Confidential Figure 8.A.

Table 8.8: Target species recorded during VP surveys March to August 2014

Common Name	Total flights (individuals)	Conservation Designations	Notes
Hen harrier	57 (63)	Red; Sch1.1 & 1A; Ann1; SBL	Resident breeder and winter migrant
Curlew	6 (6)	Red; SBL	Resident breeder and winter migrant
Merlin	4 (5)	Red; Sch1.1; Ann1; SBL	Resident breeder and winter migrant
Total	67 (74)		

Key: Ann 1- species listed under Annex 1 of the Birds Directive; Sch1.1 & 1A – species listed under Schedule 1.1 and 1A of the Wildlife and Countryside Act; SBL – species included on the Scottish Biodiversity List; Red – Red listed species on the UK Birds of Conservation Concern 4.

2015 Breeding season

8.3.8 Species recorded during the second breeding season of VP surveys (March to August 2015, inclusive) are shown in Table 8.9 below, and on Figure 8.4 and Confidential Figure 8.A.

Table 8.9: Target species recorded during VP surveys March to August 2015

Common Name	Total flights (individuals)	Conservation Designations	Notes
Pink-footed goose	1 (120)	Amber	Winter migrant
Black grouse	4 (7)	Red; SBL	Resident breeder
Hen harrier	7 (7)	Red; Sch1.1 & 1A; Ann1; SBL	Resident breeder and winter migrant
Curlew	4 (5)	Red; SBL	Resident breeder and winter migrant
Total	16 (139)		

Key: Ann 1- species listed under Annex 1 of the Birds Directive; Sch1.1 & 1A – species listed under Schedule 1.1 and 1A of the Wildlife and Countryside Act; SBL – species included on the Scottish Biodiversity List; Red/Amber – Red/Amber listed species on the UK Birds of Conservation Concern 4.

Non-breeding season

8.3.9 Species recorded during the non-breeding season of VP surveys (September 2014 to February 2015, inclusive) are shown in Table 8.10 below, and on Figure 8.5.

[34] Loch Spynie SPA is located > 25 km from the proposed development, and as such it was agreed by SNH that consideration of this site could be scoped out.

Table 8.10: Target species recorded during VP surveys September 2014 to February 2015

Common Name	Total flights (individuals)	Conservation Designations	Notes
Pink-footed goose	1 (32)	Amber	Winter migrant
Black grouse	1 (5)	Red; SBL	Resident breeder
Hen harrier	1 (1)	Red; Sch1.1 & 1A; Ann1; SBL	Resident breeder and winter migrant
Total	3 (38)		

Key: Ann 1- species listed under Annex 1 of the Birds Directive; Sch1.1 & 1A – species listed under Schedule 1.1 and 1A of the Wildlife and Countryside Act; SBL – species included on the Scottish Biodiversity List; Red/Amber – Red/Amber listed species on the UK Birds of Conservation Concern 4.

Incidental records

8.3.10 In addition, there were several incidental records of the five species scoped in for EcIA species made during the course of VP surveys (i.e. birds that were not in flight, were heard only, were observed well beyond the survey area, or were observed outside of the formal VP survey hours). These are summarised below in Table 8.11, with further details provided in Ornithological Technical Appendix 8.1.

Table 8.11: Incidental records from VP surveys March 2014 to September 2015, inclusive

Species	Number of records (individuals)		
	Breeding season 2014	Non-breeding season 2014/2015	Breeding season 2015
Black grouse		2 (6)	12 (20)
Hen harrier	2 (3)		1 (1)
Curlew			13 (15)
Total	2 (3)	2 (6)	26 (36)

Paul's Hill I

8.3.11 Table 8.12 summarises the results of VP surveys undertaken as part of the operational monitoring programme for the existing Paul's Hill Wind Farm during March to June 2015, from a VP location at NJ13871 40394, looking west towards the operational wind farm.

Table 8.12: Incidental records, from monitoring undertaken for Paul's Hill I

Species	Flights.	Individuals.
Black grouse	2	3
Hen harrier	19	19
Merlin	1	1
Total	**22**	**23**

Source: Paul's Hill I Wind Farm 2015 Operational Monitoring

Raptor Surveys

8.3.12 Breeding raptor surveys confirmed hen harrier breeding activity within the ownership boundary for the proposed development. The location of this breeding activity is shown on Confidential Figure 8.B. The results of the raptor surveys are provided in Ornithological Confidential Appendix 8.2.

8.3.13 There were four target flights recorded during the course of raptor surveys at the proposed development in 2014; two hen harrier flights and two merlin flights. The hen harrier sightings are likely to relate to a breeding pair. Details of these flights are provided in Ornithological Confidential Appendix 8.2.

8.3.14 There were seven target flights recorded during the course of raptor surveys at the proposed development in 2015, all of which were hen harrier flights. The majority (five) of these flights were of a breeding pair, and were recorded during one survey visit, on the 11 April 2015. Details of these flights are provided in Ornithological Confidential Appendix 8.2.

8.3.15 There was one additional point record made: a male hen harrier that was observed roosting in the south-western buffer on the afternoon of 01 May 2014. This, along with flights recorded during the course of the raptor surveys, is shown on Confidential Figure 8.B.

Black Grouse Surveys

8.3.16 Full results, including the number (maximum count) of black grouse recorded at each lek in 2014 and 2015, are presented in Confidential Appendix 8.2 and on Confidential Figure 8.C.

2014

8.3.17 The black grouse surveys in 2014 recorded lekking males, together with some females, at four locations within the ownership boundary, representing three or four separate leks. Two of these locations (representing either one or two separate leks) were within the ownership boundary, but outwith the 1.5 km buffer from the turbine locations, and are therefore incidental records in the context of the proposed Paul's Hill II development (see Confidential Figure 8.C, Confidential Appendix 8.2).

8.3.18 There were also two further incidental black grouse records observed within the ownership boundary in 2014, during survey work carried out under the MMP for the existing Paul's Hill Wind Farm:

- A black grouse male seen near the main access track in the spring; and
- A male black grouse which was flushed on the lower east slope of Roy's Hill, north of Straangalls, during raptor surveys in August;

8.3.19 A female capercaillie was also observed near Scoot More during the course of heather management surveys for the operational wind farm in August.

2015

8.3.20 Black grouse males were recorded lekking on four out of the six survey days carried out in 2015 for operational monitoring of Paul's Hill I, and in four discrete locations on site, representing three or four separate leks. One of these leks was within the ownership boundary, but outwith the 1.5 km buffer of infrastructure and is therefore an incidental record in the context of the proposed Paul's Hill II development.

8.3.21 The full results of the black grouse surveys are provided in the Ornithological Confidential Appendix 8.2 and on Confidential Figure 8.C.

Collision Risk Modelling

8.3.22 The risk of collision per non-breeding season for target species for which Collision Risk Modelling (CRM) was conducted is presented in Table 8.13.

8.3.23 Collision risk for hen harrier and curlew calculated with avoidance factors of 95%, 98% and 99% are presented. Values shown in bold represent species-specific avoidance levels recommended for collision risk analysis by Scottish Natural Heritage[13, 16].

Table 8.13: Estimated number of collisions per breeding season (March 2014 to August 2014 and March 2015 to August 2015, inclusive).

Species	Model type	Scenario	Estimated mortality assuming avoidance of: 95%	98%	99%
Hen harrier	Random	Worst-case: Conservative	0.65	0.26	**0.13**
		Worst-case: Non-conservative	0.16	0.06	**0.03**
		Best-case: Conservative	0.37	0.15	**0.07**
		Best -case: Non-conservative	0.09	0.03	**0.01**
Curlew	Random	Worst-case: Conservative	0.02	**0.00**	0.00
		Worst-case: Non-conservative	0.02	**0.00**	0.00
		Best-case: Conservative	0.00	**0.00**	0.00
		Best -case: Non-conservative	0.00	**0.00**	0.00

8.3.24 The risk of collision per wintering season for target species for which CRM was conducted is presented in Table 8.14. Collision risks for pink-footed goose calculated with avoidance factors of 95%, 98%, 99% and 99.8% are presented. Values shown in bold represent species-specific avoidance levels recommended for collision risk analysis by SNH[13, 14, 16].

Table 8.14: Estimated number of collisions per wintering season (geese and swans only) (September to April, inclusive).

Species	Model type	Scenario	Estimated mortality assuming avoidance of: 95%	98%	99%	99.8%
Pink-footed goose	Directional	Worst-case	4.05	1.62	0.81	**0.16**
		Best-case	3.90	1.56	0.78	**0.15**

8.3.25 The full CRM calculations are available in Ornithological Technical Appendix 8.1. Interpretation of these results is discussed in Section 8.4 of this chapter.

Trends and Projected Future Baseline

8.3.26 In the absence of development, it is assumed that the proposed Paul's Hill II Wind Farm would remain upland moorland for the foreseeable future, consisting of a mosaic of heath and blanket bog habitats. The MMP which is in place for the original Paul's Hill Wind Farm, which dictates the implementation of habitat management measures such as heather management, and control of predators and grazing, is due to remain in place until 2030 and therefore no change in land use or management would be expected for at least the next 13 years. Following the end of the MMP, it is expected that the land would return to being managed for sporting purposes (grouse shooting), with limited grazing by sheep. As such, no change in these habitats is anticipated in the medium to long term and consequently the bird community is likely to remain broadly similar.

8.3.27 It is more difficult to predict changes that that may occur in the longer-term (i.e. over 25 years), especially in the wake of climate change, which is predicted to cause range shifts in some bird species[35]. In addition, climate change may alter habitat types by impacting the composition and health of the plant communities present, thereby affecting the suitability of the proposed Paul's Hill II Wind Farm for some of the bird species which currently occupy the site. One example of this is the prospect that wetter springs and summers may favour the spread of heather beetle, which will in turn impact the quality and health of the heath at the site, potentially leading to succession to other habitat types. Baseline surveys carried out for the proposed Paul's Hill II Wind Farm represent a snapshot of the bird community at the time and cannot be extrapolated to predict future population trends in the event of climate change, persecution in the wider area or a future change in land use at the site.

8.4 ASSESSMENT

8.4.1 This section assesses the potential impacts during construction, operation and decommissioning of the Development on ornithological receptors. The Development has undergone several design iterations in order to minimise potential environmental impacts (see Chapter 3: Evolution of Design and Alternatives, for further details). Consequently, ornithological constraints have been considered during the scheme evolution, and potential impacts are assessed against this final design.

8.4.2 The main ways in which a wind farm may affect ornithological receptors are via:

- Habitat loss due to land-take;
- Disturbance or displacement; and
- Collision with turbines.

8.4.3 In addition to effects which are directly related to the development, there may be other effects which arise as a result of the combined effects of multiple wind farms (or other developments) within the local or regional area. These cumulative effects may also result in effects, which individually would not be significant, becoming more important and significant in context.

8.4.4 Each of these potential effects is discussed in turn below for each stage of the development (construction, operation, and decommissioning).

Effects during Construction

Habitat Loss

8.4.5 Construction of turbine bases, access tracks and other structures will lead to direct habitat loss and could also result in destruction or damage to nests, eggs and/or chicks. The effects of habitat loss will depend upon the extent of land-take and the type of habitat affected. Under the WCA 1981 (as amended) it is an offence to kill or injure any bird, or to damage or destroy nests and eggs; mitigation measures will be put in place to ensure that nest damage or destruction is avoided, as discussed in Section 8.5 of this chapter.

Disturbance and Displacement

8.4.6 During the construction stage of the development, the potential effects of associated noise and visual disturbance could lead to the temporary displacement or disruption of breeding and foraging birds. The level of impact depends on the timing of potentially disturbing activities, the extent of displacement (both spatially and temporally) and the availability of suitable habitats in the surrounding area for displaced birds to occupy.

8.4.7 Potential effects are likely to be greatest during the breeding season (predominantly between March and August, depending on the species under consideration); behavioural sensitivity to the effects will vary between species.

[35] Huntley B., Y. C. Collingham, R. E. Green, G. M. Hilton, C. Rahbek, and S. G. Willis. 2006. Potential impacts of climatic change upon geographical distribution of birds. Ibis 148: 8-28.

8.4.8 Disturbance of birds due to construction activities of this type have not been sufficiently quantified and the available information is often contradictory. However, it is likely that construction impacts will be greater on species that are intolerant of noise and other sources of disturbance. Larger bird species, those higher up the food chain or those that feed in flocks in the open tend to be more vulnerable to disturbance than small birds living in structurally complex or closed habitats such as woodland[36].

8.4.9 The potential effects associated with construction activities are only likely to occur for as long as the construction phase continues. They are thus short-term and can be readily mitigated by avoiding sensitive areas, (through the implementation of appropriately defined buffer zones) and by timing construction activities to avoid periods where sensitive species are present (if and where possible), such as the breeding season. The exception to this would be if an adverse effect on the breeding success of a receptor were such that the local population becomes extinct and replacement through recruitment or re-colonisation does not occur. For example, a study by Pearce-Higgins *et al*.[37] found that snipe and curlew densities declined significantly on wind farms during construction and had not recovered by the first year post-construction.

Effects during Operation

Disturbance and Displacement

8.4.10 The operation of turbines and associated human activities for maintenance purposes also has the potential to cause disturbance and displace birds from the development. Disturbance effects during the operational phase may be less than during the construction phase, as species may become habituated to turbines and disturbance due to human activities will be considerably reduced.

8.4.11 Studies have shown that, in general, species are not disturbed beyond 500 to 800 m from turbines[3 38 39] and, in some cases, birds do not appear to have been disturbed at all[40 41 42 43].

8.4.12 There is less consensus of opinion about disturbance effects closer to wind-farm infrastructure. Several studies have examined this in detail, and these are summarised below.

8.4.13 Pearce-Higgins *et al*.,[39] found evidence of lower frequencies of occurrence of some species within the vicinity of wind turbines during the breeding season, with a significant reduction in frequency of occurrence, compared to control sites, in seven of the 12 species studied. The authors extrapolated these findings to predict a percentage reduction in breeding densities within 500 m of turbines and found that seven of the 12 species showed a significantly lower frequency of occurrence: buzzard (*Buteo buteo)*, hen harrier, golden plover, snipe, curlew, meadow pipit (*Anthus pratensis*) and wheatear (*Oenanthe oenanthe*), while there was no significant effect of wind farm proximity on kestrel, red grouse, lapwing, skylark (*Alauda arvensis)* and stonechat (*Saxicola torquata*) distribution. A more recent study of displacement effects of wind farms on ten species of upland breeding birds, by the same lead author[37] found evidence for population declines in red grouse, snipe and curlew associated with wind farm construction, but little evidence for consistent post-construction population declines in any species. However, a recent study by Sansom *et al*.[44] reported no displacement of golden plover during wind farm construction, but a significant reduction in abundance during the operational phase. Further studies of golden plover[42] and curlew[41], involving long-term monitoring found no evidence of displacement due to wind farm infrastructure in either species. In addition, a synthesis of European work found no statistically significant adverse effect on breeding population density of any bird species, including several species found within the proposed development such as skylark and meadow pipit[3].

8.4.14 In terms of non-breeding population densities, Hötker *et al*.,[38] reported a significantly adverse effect on geese (several species combined), golden plover and lapwing and a significantly positive effect on starling, although the distances involved were relatively limited (mean distances were between 30 m for starling and 373 m for geese). In their study of the effects of wind turbines on the distribution of wintering farmland birds Devereux *et al*.,[40] found no effect on four species groups (seed-eaters, corvids, gamebirds and skylarks); the only exception was pheasant (*Phasianus colchicus*).

8.4.15 Therefore, it is clear that potential disturbance and displacement effects associated with wind farm construction and operation vary between species, sites, years and seasons and should be considered on a case-by-case basis. Construction-phase monitoring at Paul's Hill showed construction activities across the wind farm area may have had a disturbance effect on the red grouse population whilst construction was ongoing, and a displacement effect upon the location of golden plover nests within the Management Area. However, there was no decline in the total number of birds breeding within the Management Area in 2005 compared to in 2004 prior to construction activities on site

8.4.16 The evidence from the existing Paul's Hill Wind Farm for the response of target species to the operational wind farm is discussed in the species accounts in the 'Feature Assessment' section below.

8.4.17 Individual turbines, or a wind farm as a whole, may present a barrier to the movement of birds, restricting or displacing birds from much larger areas. The effect this would have on a population is subtle and difficult to predict with any degree of certainty. If birds regularly have to fly over or around obstacles or are forced into suboptimal habitats, this may result in reduced feeding efficiency and greater energy expenditure. By implication, this will reduce the efficiency with which they accumulate reserves, potentially affecting breeding success or survival.

Collision with Turbines

8.4.18 Collision of a bird with turbine rotors is almost certain to result in the death of the bird. In low density populations (e.g. raptors) this could have a more adverse effect on the local population than in higher density populations (e.g. skylark) because a higher proportion of the local population would be affected in a low density population. The frequency and likelihood of a collision occurring depends on a number of factors. These include aspects of the size and behaviour of the bird (including their use of a development site), the nature of the surrounding environment, and the structure and layout of the turbines.

8.4.19 Collision risk is perceived to be higher for birds that spend much of the time in the air, such as foraging raptors and those that have regular flight paths between feeding and breeding/roosting grounds (e.g. geese). The risk of bird collisions at wind farms is greatest in areas where large concentrations of birds are present (such as on major migration routes), and in poor flying conditions, such as rain, fog, strong winds that affect birds' ability to control

[36] Hill, D.A. Hockin, D. Price, D. Tucker, G. Morris, R. and Treweek, J. (1997). Bird Disturbance: Improving the Quality of DISTURBANCE research. Journal of Applied Ecology 34, 275-288.

[37] Pearce-Higgins, J.W., Stephen, L., Douse, A. and Langston, R. H. W. (2012). Greater Impacts of Wind Farms on Bird Populations During Construction Than Subsequent Operation: Results of a Multi-site and Multi-species Analysis. Journal of Applied Ecology 49, 386–394.

[38] Hötker, H., Thomsen, K.M. and Koster, H. (2006). The Impact of Renewable Energy Generation on Biodiversity With Reference to Birds and Bats – Facts, Gaps in our Knowledge, Areas for Further Research and Ornithological Criteria for the Expansion of Renewables. NABU Report, Germany.

[39] Pearce-Higgins, J.W., Stephen, L., Langston, R.H.W., Bainbridge, I.P. and Bullman, R. (2009). The Distribution of Breeding Birds Around Upland Wind Farms. Journal of Applied Ecology 46, 1323-1331.

[40] Devereux, C.L., Denny, M.J.H. and Whittingham, M.J. (2008). Minimal Effects of Wind Turbines on the Distribution of Wintering Farmland Birds. Journal of Applied Ecology 45, 1689–1694.

[41] Whitfield, D.P., Green, M. and Fielding, A.H. (2010). Are Breeding Eurasian Curlew Numenius Arquata Displaced by Wind Energy Developments? Natural Research Projects Ltd, Banchory, Scotland.

[42] Douglas, D.J.T., Bellamy, P.E. and Pearce-Higgins, J.W. (2011). Changes in the Abundance and Distribution of Upland Breeding Birds at an Operational Wind Farm. Bird Study 58, 37-43.

[43] Fielding, A.H. and Haworth, P.F. (2013). Farr Wind Farm: A Review of Displacement Disturbance on Golden Plover Arising from Operational Turbines 2005-2013. Haworth Conservation, Isle of Mull, Scotland.

[44] Sansom, A., Pearce-Higgins, J.W., and Douglas, D.J.T. (2016) Negative impact of wind energy development on a breeding shorebird assessed with BACI study design. IBIS 158, 3, 541-555.

flight manoeuvres, or on dark nights when visibility is reduced[45] [3]. Birds may also be more susceptible if the wind farm is located in an area of high prey density.

8.4.20 It should be noted that operational disturbance and collision risk effects are mutually exclusive in a spatial sense; i.e. a bird that avoids the wind farm area due to disturbance cannot be at risk of collision with the turbine rotors at the same time. However, they are not mutually exclusive in a temporal sense; i.e. a bird may initially avoid the wind farm but habituate to it, and would then be at risk of collision.

8.4.21 Passerines nesting within a wind farm site would be expected to be regularly flying between turbines and could therefore be expected to be most at risk of collision. However, passerines tend to fly below CRH and evidence suggests that passerines collide with turbines too infrequently for there to be a significant effect of collision at the population level. Moreover, most of the species concerned are of low or negligible conservation value. Collision records for Paul's Hill since it became operational in 2006 show there have been no collisions of target species.

8.4.22 A summary of collisions at European wind farm sites for target species recorded at the Development Site is presented in Table 8.15. Target species listed are those for which CRM was undertaken.

Table 8.15: Reported collisions at European wind farms of target species (after Hötker et al., 2006[38] and Dürr, 2017[46]).

Species	Collisions (individuals)	Countries in which collision(s) occurred.	European population (BirdLife International, 2016[47])
Pink-footed goose	Not recorded	-	50,000-69,000[1] >290,000[2]
Hen harrier	8*	Spain (1) UK (3)* Norway (1) Germany (1) France (2)	30,000-54,400[1]
Curlew	12	Germany (4) France (1) The Netherlands (7)	212,000-292,000[1]
[1] breeding pairs			
[2] wintering individuals			

**These are the numbers reported in Dürr 2017, however Natural Power are aware of a further four collisions in Scotland so the total for known hen harrier collisions in the UK is seven.*

Effects during Decommissioning

8.4.23 Turbine removal may cause disturbance to birds breeding, foraging or roosting within the proposed Paul's Hill II Development Area. The level of impact will depend on the bird species present at the time of decommissioning and cannot be reliably predicted at this stage. However, as decommissioning activities are of a similar type and intensity as construction activities, the assessment considers that the potential effects of decommissioning will be similar in nature to the potential effects of construction, with the exception that habitat is likely to be restored and displaced birds will be able to return to abandoned territories.

Feature Assessment

8.4.24 As per the 2017 Scoping Report[1], the features and effects that will be assessed in this EcIA are shown in Table 8.16 below, with the addition of curlew which has been scoped back into the assessment following an update to the proposed turbines (see Section 8.2 for further details).

Table 8.16: Features and effects to be assessed

Receptor	Impact	Assessment
Pink-footed goose	Collision	CRM
Black grouse	Disturbance/displacement	EcIA
Curlew	**Collision**	**CRM**
Hen harrier	Collision & Disturbance/displacement	CRM & EcIA
Merlin	Disturbance/displacement	EcIA

8.4.25 On the basis of the baseline survey results outlined in Section 8.3, the IOFs have been assigned the following assessment values.

Table 8.17: Assessment values assigned to the Important Ornithological Features

Common Name	Conservation Designations	Value	Justification
Hen harrier	Red; Sch1.1 & 1A; Ann1; SBL; LBAP	National	A regularly occurring regionally important population of a nationally important SBL, Annex I and Schedule 1.1 species. Population present falls short of SSSI selection criteria (1% or more of the total GB breeding population), but is important in the context of SNH NHZ populations. However, considered nationally rather than regionally important due to the low numbers and precarious conservation status of hen harriers in the UK. In addition, Paul's Hill has held nearly 1% of the GB population (6 pairs) on occasion in the past.
Merlin	Red; Sch1.1; Ann1; SBL	Regional	A regularly occurring, locally important population of a nationally important species listed an LBAP priority species and species listed under Schedule 1 of the WCA or Annex I of the Birds Directive.
Black grouse	Red; SBL; LBAP	Regional	A regularly occurring regionally important population of a nationally important SBL species. >1% of the population of NHZ 10 occasionally present.
Pink-footed goose	Amber	Local	A species listed as a qualifying feature of an internationally designated site (SPA/Ramsar), but present infrequently and in very low numbers.

[45] Langston, R.H.W. and Pullan, J.D. (2003). Windfarms and Birds: an Analysis of the Effects of Wind Farms on Birds, and Guidance on Environmental Assessment Criteria and Site Selection Issues. Report T-PVS/Inf. 2003. 12, by BirdLife International to the Council of Europe, Bern Convention on the Conservation of European Wildlife and Natural Habitats. RSPB/BirdLife in the UK.

[46] Vogelverluste an Windenergieanlagen / Bird fatalities at wind turbines in Europe; Daten aus der zentralen Fundkartei der Staatlichen Vogelschutzwarte im Landesamt für Umwelt Brandenburg zusammengestellt: Tobias Dürr; Stand vom: 01. August 2017. Available at http://www.lfu.brandenburg.de/cms/detail.php/bb1.c.312579.de accessed 11/10/2017

[47] BirdLife International (2017) IUCN Red List for birds. Downloaded from http://www.birdlife.org on 11/10/2017

Common Name	Conservation Designations	Value	Justification
Curlew	NT; Red; SBL; LBAP	Local	Other species of conservation concern, including species included on the UK BoCC Red and Amber Lists[25].

Pink-footed goose

Introduction

8.4.26 Pink-footed goose is included on the UK BoCC Amber List due to the large numbers that winter in the UK (at least 80% of the European flyway) and its restricted distribution (at least 90% of birds in ten or fewer sites)[25]. Scotland is a key wintering area for birds which breed in Iceland and Greenland; large feeding and roosting flocks are present in eastern and central Scotland, especially in autumn and early winter[48]. The total population in Britain in October 2016 was 481,341, of which 64.4% were in Scotland, and 74,755 (15.5%) were in North-east Scotland[49].

8.4.27 In Moray & Nairn, pink-footed goose is described as a very common migrant and winter visitor[50], and the Moray and Nairn Coast SPA on the north coast of Moray (approximately 21 km north of the proposed Paul's Hill II Wind Farm) is designated in part for its wintering population of this species (although numbers at this location have declined dramatically since site designation)[51]. Although the proposed Paul's Hill II Wind Farm is located in NHZ 10, there is no evidence that any pink-footed geese observed overflying the site were wintering in this NHZ, and therefore NHZ 21 (Moray Firth) has also been considered for this species. The most recent estimate of peak winter abundance in the two relevant NHZs is 35,370 in NHZ 21 and seven in NHZ 10[19]. There is a peak in numbers of this species in Moray Firth NHZ in October, coinciding with autumn migration, but numbers remain variable throughout the winter indicating that some birds winter here rather than staging on their way through[19].

Baseline

8.4.28 Two pink-footed goose flights were recorded from VPs 2 and 3 during VP surveys undertaken at Paul's Hill II between March 2014 and August 2015 (see Figures 8.4 and 8.5), totalling 152 individuals. Both were recorded entirely at height band 4 (i.e. over 125 m), and almost certainly represent high commuting flights at altitude considerably above the 149.9 m maximum tip height. These were the only records of pink-footed goose at the site from any of the survey work undertaken.

Potential collision effects

8.4.29 Of the two flights recorded during baseline surveys one, of 32 individuals recorded during the 2014 autumn migration period, was in the CRZ. Details of the collision risk assessment are provided in Technical Appendix 8.1. The model shows that, assuming a 99.8% avoidance rate[14], a WCS collision risk of 0.16 collisions per non-breeding season (equivalent to one collision every six years) is predicted (see Table 8.14). The flight of 120 birds recorded in April 2015 was not in the CRZ and therefore CRM was not carried out for this flight. As such, the annual predicted collision mortality rate is also 0.16. This represents <0.001% of the total population estimate of the two NHZs in the vicinity of the site (<0.001% of the NHZ 21 population, and 2.3% of the NHZ 10 population), and <0.0001% of the most recent Scottish wintering population estimate[49]. Annual mortality of pink-footed geese older than approximately six months that overwinter in the UK has been estimated at 14%[52], and as such even if actually realised, the predicted collision rate would be undetectable against background annual mortality. The continuing increase in the UK pink-footed goose wintering population (e.g. a 113% increase between 1985/86 and 2011/12[53]) should also be considered when assessing these local level population impacts.

8.4.30 As no pink-footed goose collisions have been reported at European wind farms[46] (Table 8.15) it appears that collisions of this species are relatively rare[54], as is reflected in the current recommended avoidance rate. In addition, although this flight qualifies for CRM based on categorising all flights above 125 m as being at CRH, this kind of high directional flight recorded during the autumn migration period is unlikely to have been between 125 m (the original threshold for height band 4) and the maximum blade tip height of 149.9 m, and is therefore unlikely in real terms to represent geese at risk of collision. This is supported by results from monitoring undertaken at the existing Paul's Hill Wind Farm, where pink-footed geese are rarely recorded and there have been no collisions.

8.4.31 As such, the potential effect as a result of collision risk is considered to be of **negligible magnitude**, and therefore **not significant** for pink-footed goose.

Black grouse

Introduction

8.4.32 Black grouse is an LBAP priority species and is included on the SBL. The species is also Red-listed due to both historical and recent population declines[25]. The National Survey carried out in 2005 estimated the Scottish population of displaying male black grouse at 3,344[55]. The North-east Scotland breeding bird atlas (2011)[56] estimated a local population of 700 lekking males, which represents 20% of the known Scottish population from the last survey, and 14% of the UK population[57]. The NHZ population in NHZ 10 is estimated at 114 displaying black grouse males (95% confidence limits 62-170)[19]. Most Scottish black grouse populations have been shown by recent trends from most black grouse study groups to have remained relatively stable over the last 10 years[19].

8.4.33 In Moray & Nairn, black grouse is described as a scarce resident breeder[50]. Black grouse are known to breed at the site, with several established leks within the ownership boundary. In 2015, they were also reported in the Moray and Nairn Bird Report[50] at 16 other localities within Moray & Nairn: Aitnoch, Altavallie, Altyre, Auchmair (Cabrach), Badnafrave, Berryburn Wind Farm, Carn Biorach, Drynachan, Dunearn, Glen Brown, Glenconglass area, Hill of Bank (Cabrach), Inchnacape, Knock of Braemoray, Little Aitnoch and Tomintoul.

8.4.34 The 2007-2011 Bird Atlas data provided by the BTO included 15 records of this species from the four 10 km grid squares in closest proximity to the proposed Paul's Hill II development. The RSPB also confirmed black grouse presence in 16 x 1 km grid squares (see Confidential Appendix 8.2).

Baseline

8.4.35 Up to four leks were recorded at the proposed Paul's Hill II Wind Farm in both 2014 and 2015: see Figure 8.C, Confidential Appendix 8.2. The results show four discrete lekking locations consisting of between one and three

[48] Forrester, R.W., Andrews, I.J., McInerny, C.J., Murray, R.D., McGowan, R.Y., Zonfrillo, B., Betts, M.W., Jardine, D.C. & Grundy D.S. (eds). 2007. The Birds of Scotland. The Scottish Ornithologists' Club, Aberlady.

[49] Mitchell, C. & K. Brides. 2017. *Status and distribution of Icelandic-breeding geese: results of the 2016 international census*. Wildfowl & Wetlands Trust Report, Slimbridge. 19pp

[50] Cook, M. (Ed). 2017. Birds in Moray & Nairn in 2015. Bird report number 30. Scottish Ornithologist's Club. Available at http://www.birdsinmorayandnairn.org/2011-onwards/ last accessed 11/09/2017

[51] JNCC SPA species accounts, available at: http://jncc.defra.gov.uk/pdf/UKSPA/UKSPA-A6-18.pdf last accessed 09/11/2017

[52] Trinder, M., Rowcliffe, M., Pettifor, R., Rees, E., Griffin, L., Ogilvie, M. and Percival, S. (2005). Status and Population Viability Analyses of Geese in Scotland. Scottish Natural Heritage Commissioned Report No. 107.

[53] Hayhow, D.B., Conway, G., Eaton, M.A., Grice, P.V., Hall, C., Holt, C.A., Kuepfer, A., Noble, D.G., Oppel, S., Risely, K., Stringer, C., Stroud, D.A., Wilkinson, N. and Wotton, S. (2014). The State of the UK's Birds 2014. RSPB, BTO, WWT, JNCC, NE, NIEA, NRW and SNH, Sandy, Bedfordshire.

[54] Plonczkier, P. and Simms, I. C. 2012. Radar monitoring of migrating pink-footed geese: behavioural responses to offshore wind farm development. Journal of Applied Ecology, 49: 1187–1194.

[55] Sim, I. M. W., Eaton, M. A., Setchfield, R. P., Warren, P. K., Lindley, P. 2008. Abundance of male Black Grouse *Tetrao tetrix* in Britain in 2005, and change since 1995–96. Bird Study. 55. 304–313.

[56] Francis, I. and Cook, M. (Eds.) 2011. The Breeding Birds of North-east Scotland. Scottish Ornithologist's Club, Aberdeen

[57] Francis, I. 2011. *Black grouse*. pp 92-93 in Francis, I. and Cook, M. (eds.). The Breeding Birds of North-east Scotland. Scottish Ornithologist's Club, Aberdeen

lekking areas at each location, which move around within the broader area but remain consistent between years. A fifth lekking location at the Forkins in 2015 may be associated either with the lek at the existing wind farm, or with the lek at Corglass Farm, but it is sufficiently distant from both of these to be potentially an independent fifth lek. Birds were only sighted at this location once, with two males observed here on 25 March 2015. This is the lek closest to proposed infrastructure, being 199 m from Turbine 7, and 185 m to the closest infrastructure (track). It is also one of only two of the lek locations which are within 750 m of proposed infrastructure; SNH currently recommends that no construction work takes place within 750 m of lekking black grouse. The other relatively close lek in 2015, at Corglass Farm, was 705 m from Turbine 1 and 363 m from the new track. However recent research by Zwart *et al*.,[58] found that leks more than 500 m from a proposed turbine did not move after wind farm construction. The Corglass Farm lek was also the closest to infrastructure in 2014, at 1.2 km from Turbine 1 and 660 m from the track. All of the other leks recorded in 2014 were >1.5 km from the proposed wind farm.

Potential disturbance/displacement effects

8.4.36 Disturbance to lekking birds is expected to be of highest significance during construction and less significant during the operation of the development. This is supported by patterns of lekking observed at Paul's Hill, with lekking birds observed on the operational wind farm; e.g. within 142 m of T14 on 30 March 2015, and within 30 m of T28 on 28 April 2015, and *c.* 17 m from the main wind farm track on both occasions; this distance is closer than any of the proposed Paul's Hill II turbines will be to known leks. Given that the exact location of birds displaying at a given lek can vary quite considerably between years, and even between different days, and the availability of extensive suitable habitat within the wider area at Paul's Hill, it is considered that should any lekking birds be disturbed in the immediate vicinity of construction they are more likely to relocate to alternative locations further away from construction, rather than be displaced. During construction, if works are undertaken during the lekking season, disturbance can be reduced if operations are restricted in the areas closest to the lek (see Section 8.5).

8.4.37 During construction and operation there is also the potential for disturbance to nesting black grouse. It is generally the case that most nests are within 1.5 km of the lek site. It is also possible that construction activities could damage or destroy ground nests of black grouse should these nests have been established before the construction activities commence; the risks associated with this would be mitigated by pre-construction walkover surveys/ nest checks, carried out by a suitably qualified ECoW, with appropriate disturbance buffers enforced around any lek or active nest (see Section 8.5: Mitigation for further information). The habitat to be lost directly to components of the wind development is small, any direct loss of habitat is considered to be of negligible significance, as it is unlikely that the loss of this habitat would have any significant impact on breeding black grouse within the development site or surrounding area. There may also be some positive effects associated with the provision of grit by wind farm tracks and hardstandings; they have been sighted on the tracks for the existing wind farm on several occasions, and birds were recorded displaying alongside the existing wind farm tracks twice in 2015.

8.4.38 Over the **short-term**, there is therefore potential for **moderate magnitude** disturbance/displacement effects on lekking and breeding black grouse during construction of the proposed Paul's Hill II Wind farm, dropping to **negligible** following implementation of embedded mitigation (see Section 8.5). During operation, potential disturbance/displacement effects are likely to be of **negligible magnitude.** As such the integrity of the receptor is unlikely to be affected and any impacts will be **not significant**.

Curlew

Introduction

8.4.39 Curlew is included on the SBL and the LBAP, and is also Red-listed[25]. The Scottish breeding population in 2007 was estimated at 58,500 pairs, which is 16-27% of the European breeding population[48]. Despite recent records for Scotland indicating a 55% decline in breeding birds between 1995 and 2012[59], the latest Bird Atlas shows upland breeding populations of this species to have remained relatively stable in the area surrounding the proposed Paul's Hill II Wind Farm over the past 20 years. The breeding population of North-east Scotland is estimated at 3,000 to 5,000 pairs; c. 7% of the Scottish population[56].

8.4.40 In Moray and Nairn, curlew is described as a common breeder, and a very common migrant and winter visitor[50]. The population in NHZ 10 is estimated at 811 breeding pairs (confidence interval: 725-897) i.e. c. 20% of the regional population, and in NHZ 21 it is 385 breeding pairs (confidence interval: 342-428)[19]. The 2007 – 2011 Bird Atlas data provided by the BTO included 68 records of this species from the four 10 km grid squares in closest proximity to the proposed Paul's Hill II development.

Baseline

8.4.41 Curlew have been scoped back into the assessment process due to meeting the CRM criteria for the updated turbine parameters. However, as upland bird survey results are not reported on in this EIAR, this species is only assessed for collision impacts and not for disturbance/displacement impacts. Ten curlew flights were recorded from VPs 2 and 3 during VP surveys undertaken at Paul's Hill II between March 2014 and August 2015 (see Figure 8.4), totalling 11 individuals.

Potential collision effects

8.4.42 Of the ten flights recorded during baseline surveys, five included a period in the CRZ. All of these flights were primarily at height band 1, including two in the CRZ of Turbine 6, with only two flights having a period spent above height band 1 (and none above height band 2). As such, this species did not previously qualify for CRM, as fewer than three flights/ten individuals were recorded at CRH in the CRZ. However, the change in turbine specification and the subsequent inclusion of height band 1 in the CRZ of Turbine 6 has resulted in a five flights being in the collision risk zone at CRH rather than two.

8.4.43 Details of the collision risk assessment are provided in Technical Appendix 8.1. The model shows that, using the precautionary 98% avoidance rate as recommended by SNH, a WCS collision risk of 0.009 collisions per year (equivalent to one collision every 111 years) is predicted (see Table 8.13). In light of this, it is considered that collision risk to curlew is of **negligible magnitude** and therefore **not significant**.

Hen harrier

Introduction

8.4.44 Hen harrier is an Annex I and Schedule 1 species of high conservation concern in the UK. It is an SBL priority species and is on the UK BoCC Red-list due to a historical decline in the UK and unfavourable population status in Europe[25]. It is also a North-east Scotland LBAP priority species. In the last census, the Scottish population was estimated at 505 pairs, down from 633 pairs in 2004, representing 76% of the UK population[60] and 5-9% of the European population[48]. The breeding population of North-east Scotland has been estimated at 18-22 pairs; 3% of the Scottish population[56]. The most recent estimate for number of breeding pairs of hen harrier in Central Highlands (NHZ 10) is 18 in with upper and lower estimates of 15-20[19]. Persecution of this species across Scotland is well documented and remains severe in certain areas[48].

8.4.45 In Moray & Nairn, hen harrier is described as a rare resident breeder, very scarce migrant and winter visitor[50]. They are known to breed at Paul's Hill, and in general the pairs on Paul's Hill produce average or above average sized clutches, with several highly productive years with pairs fledging at least four chicks in 2006, 2014 and 2015. In 2015 hen harrier were also reported in the Moray and Nairn Bird Report[50] breeding at 11 other localities: of the 11 pairs located eight failed and the three successful pairs raised ten young between them. The report states that

[58] Zwart, M.C., Robson, P., Rankin, S., Whittingham, M.J. & McGowan, P.J.K. 2015. Using Environmental Impact Assessment and Post-construction Monitoring Data to Inform Wind Energy Developments. Ecosphere 6(2), article 26.

[59] Harris, S.J., Risely, K., Massimino, D., Newson, S.E., Eaton, M.A., Musgrove, A.J., Noble, D.G., Procter, D. & Baillie, S.R. 2014. The Breeding Bird Survey 2013. BTO Research Report 658, Thetford.

[60] Hayhow D. B., Eaton M. A., Bladwell S., Etheridge B., Ewing S., Ruddock M., Saunders R., Sharpe C., Sim I. M. W. and Stevenson A. 2013.The status of the Hen Harrier, Circus cyaneus, in the UK and Isle of Man in 2010. Bird Study 60: 446-458.

'ringtails'[61] were seen in spring 2015 in three localities in east Moray but no breeding pair was found. There are also three records within the report from the non-breeding season: one from Roy's Hill (Ben Rinnes) on 01 January; one at Tomnamoon on 10 September and one at Littlemill (Nairn) on 27 November. The 2007 – 2011 Bird Atlas data provided by the BTO included 30 records of this species from the four 10 km grid squares in closest proximity to the proposed Paul's Hill II development (see Confidential Appendix 8.2).

Baseline

8.4.46 There were 61 records of hen harrier flights from baseline VP surveys; 60 (totalling 70 individuals) from the breeding season (see Confidential Figure 8.A) and one flight of a single bird from the non-breeding season (Figure 8.5). Twenty-eight of these flights were entirely at height band 1, i.e. below 18 m. There were also three incidental records collected during VP surveys; two during the 2014 breeding season (a pair and a lone male), both of which were non-flight records of the breeding pair, and one recorded flying over the access track north of Roy's Hill encountered by a surveyor *en route* to a VP during the breeding season 2015. Nineteen hen harrier flights associated with the breeding pair were also recorded during VPs undertaken for the existing Paul's Hill Wind Farm in 2015. A single hen harrier flight was recorded during diver surveys in May 2014 and there were three flights recorded during black grouse surveys in April and May 2014, as well as a record of a hen harrier alarming and swooping near the nest location in May 2015.

8.4.47 Hen harrier were confirmed to be breeding at Paul's Hill in 2014 and 2015, with nine flights of 12 individuals (including one flight of four juveniles) also being recorded during breeding raptor surveys (see Confidential Figure 8.B and Confidential Appendix 8.2). Hen harrier are known to breed regularly within the ownership boundary of Paul's Hill, and are the focus of management measures for the existing Paul's Hill Wind Farm.

Potential disturbance/displacement effects

8.4.48 All of the nest locations during baseline surveys in 2014 and 2015 were >1.5 km from the nearest proposed turbine, and the closest infrastructure (proposed track) was 1.4 km from one of the two 2015 nest locations. This is beyond the maximum published disturbance distance of 1 km[62], and well beyond the recommended disturbance buffer of 500 – 750 m. However, hen harrier have been known to nest in the vicinity of one of the proposed Paul's Hill II turbine locations in the past (see Confidential Figure 8.B) and did so again in 2017. They are regularly seen prospecting for nest sites in this area during survey work for Paul's Hill, as this is one of the few areas of the site which contains an expanse of heather suitable for nesting. As such, there may be disturbance/displacement impacts associated with the construction of the proposed extension. However, given that hen harriers have only chosen to nest in this location three times out of 25 breeding attempts over the past 12 years, it is considered that the magnitude of these impacts will be no more than **minor** during the construction period.

8.4.49 During the operation phase, it is considered unlikely that there will be any displacement effects caused by avoidance of the operational turbines, as hen harriers have been shown to have moved closer to the existing Paul's Hill Wind Farm since it became operational, including nesting within 200 m of the turbines on occasion. Other displacement studies have also concluded that foraging hen harriers have a low sensitivity to disturbance at operational wind farms and that birds will nest within 200 to 300 m of turbines[63].

8.4.50 The siting of one of the turbines in one of the areas used for nesting (see Confidential Figure 8.B) will cause a direct impact due to loss of nesting habitat, potentially displacing one breeding pair, and the construction of permanent wind farm infrastructure will also result in the loss of some foraging habitat. However, the location of preferred nesting areas within the ownership boundary has changed regularly throughout the period that monitoring has been being undertaken for the existing Paul's Hill Wind Farm, and natural succession processes mean that areas of heather which are currently suitable for nesting and/or foraging will become less so with time as the older heather eventually dies back, and new pioneer growth replaces it. Conversely, other areas of heather on site which are currently not tall or mature enough for nesting will mature, and so changing of favoured nesting areas is something that can be expected to happen naturally over time. There is alternative nesting habitat both within and surrounding the Paul's Hill ownership boundary and embedded mitigation is proposed to ensure that this remains the case (see Section 8.5), and as such any displacement of a breeding pair is expected to be localised and temporary.

8.4.51 Given the extensive alternative habitat available for foraging both at Paul's Hill and in the surrounding wider area, it is considered that impacts to harrier foraging from the construction of the wind farm will be **negligible**.

8.4.52 The overall impacts associated with disturbance/displacement are expected to occur over the **short to medium term** and be of **moderate magnitude** and thus **not significant,** principally based on the loss of suitable nesting habitat in one intermittently used breeding location. However given that locations of suitable breeding habitat change naturally over time, and the infrequency with which that location is used, a temporary, moderate magnitude impact is considered to be the worst-case scenario. Embedded mitigation applied will ensure there is alternative breeding habitat created and maintained elsewhere within the ownership boundary (see Section 8.5), and as such there is the potential for beneficial effects in the longer term associated with effective habitat management measures for this species; wind developments and the associated management and monitoring provide relatively safe havens for hen harrier, and have the potential to assist in the conservation of this species when planned sensitively.

Potential collision effects

8.4.53 Of the 60 hen harrier flights recorded during the breeding season VPs, 13 were within the CRZ and as such CRM was conducted for this season. Assuming a 99% avoidance rate[13], a WCS collision risk of 0.13 per breeding season (equivalent to one collision every 7.6 years) is predicted (see table 8.13). Only one flight of a single bird was recorded during non-breeding season, and so CRM was not conducted for this season. As such, the annual predicted collision mortality rate is 0.13. This represents 0.73% of the total population estimate for NHZ 10, and <0.03% of the most recent Scottish breeding population estimate[60]. Several of these flights only qualify for CRM based on the precautionary approach of considering of all flight height bands as being at CRH; in reality many of these flights were low level hunting flights and therefore below the rotor swept area so in real terms will not have represented harriers at risk of collision. This inflates the collision risk, which is likely to be considerably lower than 0.13 birds per year.

8.4.54 Eight hen harrier collisions have been reported at European wind farms, three of which were in the UK[46] (Table 8.13). Natural Power is also aware that there are four other, unpublished collisions of this species in Scotland. Notwithstanding this, hen-harrier collisions appear to be an uncommon event which suggests that this species is not particularly vulnerable to collision. Studies have shown that hen harriers will forage in proximity to turbines[64] [65] [66], and no studies have shown any significant adverse effect. This is supported by the pattern of behaviour observed at the existing Paul's Hill Wind Farm where, despite breeding hen harrier apparently moving closer to the operational wind farm since construction, including nesting within 200-300 m of operational turbines and frequently flying through and hunting within the wind farm, there have been no known collisions and the birds have been observed to show good avoidance of the moving turbine blades. Harriers are generally most at risk of collision during the breeding season in the proximity of nest sites; while 'skydancing' (displaying), carrying out food passes

[61] Both female and immature hen harriers are brown with a long, barred tail and as such are often referred to as 'ringtails'

[62] Ruddock, M. and Whitfield, D.P. (2007). A Review of Disturbance Distances in Selected Bird Species. A report from Natural Research (Projects) Ltd. to Scottish Natural Heritage.

[63] Whitfield, D. P. & Madders, M. 2005. A review of the impacts of wind farms on hen harriers. Natural Research Information Note 1. Natural Research Ltd., Banchory.

[64] Thelander, C. G. & Rugge, L. 2000. Avian risk behavior and fatalities at the Altamont wind resource area. National Renewable Energy Laboratory NREL, Colorado.

[65] Green, M. 1995. Effects of Windfarm Operation on the Winter Bird Community of the Bryn Titli Uplands: 1994/95. Report to National Wind Power Ltd.

[66] Bioscan (UK) Ltd. 2001. Novar Windfarm Ltd Ornithological Monitoring Studies: breeding bird and birdstrike monitoring 2001 results and 5-year review. Report to National Wind Power Ltd.

or during practice flights of juveniles. When hunting, harriers generally fly below rotor height, close to ground in order to avoid being detected by prey[67]. Risks during the vulnerable periods can be minimised by reducing the suitability of habitat in the immediate vicinity of the turbines for nesting; see Section 8.5.

8.4.55 As such, the potential impact as a result of collision risk is considered to be of **minor magnitude**, and therefore **not significant** for hen harrier.

Merlin

Introduction

8.4.56 Merlin is an Annex I and Schedule 1 species; it is also an SBL priority species. Merlin has recently been moved back to the BoCC Red List from the Amber List as its recovery from historical decline has faltered[25]. The most recent national survey found that numbers of UK breeding merlin appear to be relatively stable[68].

8.4.57 In Scotland, merlin occur widely, and they are common in North-east Scotland with a healthy population[48], estimated at around 75-85 pairs; 10% of the Scottish population[56]. The species is a scarce resident breeder on upland heather moors, and passage and winter visitor mainly to coastal and low-lying areas[48], with 733 breeding pairs (63% of the UK population) estimated from the last census[68]. Since publishing of the census there has been some disagreement regarding the extrapolation from the stratified element of the survey, leading to a dispute over whether the published Scottish population estimate is too high[19]. Using relative abundance scores from the Bird Atlas and real abundance from intensively studied NHZs, and apportioning them between all 21 NHZs, gives a Scottish population estimate of 433 pairs of which 13 are within NHZ 10 (Central Highlands)[19].

8.4.58 In Moray and Nairn, merlin is described as a scarce resident breeder and migrant. In 2015, 43 sites were checked and 18 of these were found to be occupied by pairs, 17 of which laid clutches. Eleven pairs were successful, and these raised 38 young between them. Occupation and breeding success were both low in west Moray, where only two out of four nests were successful - two of them failed due to mammal predation[50]. The 2007 – 2011 Bird Atlas data provided by the BTO included 23 records of this species from the four 10 km grid squares in closest proximity to the proposed Paul's Hill II development (see Confidential Appendix 8.2).

Baseline

8.4.59 There were four merlin flights, totalling five individuals, recorded during baseline VP surveys at the proposed Paul's Hill II Wind Farm (see Figure 8.4). All of these flights were recorded in the 2014 breeding season. Two merlin flights were also recorded during the course of raptor surveys undertaken at the proposed Paul's Hill II Wind Farm in 2014. There was also a flight recorded during black grouse surveys in April 2014. The only record from 2015 was an incidental record of a flight by a single merlin recorded during 2015 VP surveys at the existing Paul's Hill Wind Farm.

8.4.60 There was no evidence of breeding across the survey area in either 2014 or 2015, but raptor surveys undertaken at Paul's Hill I in 2016 and 2017 did record likely (though unconfirmed) breeding attempts by this species in both years. In 2016 a pair was observed on several occasions alarm calling over an area of deep heather, but when the suspected nest location was checked in late June no sign of a nest was found and no further merlin activity was recorded in that year; it was concluded that the breeding attempt had failed at or before laying stage. In 2017, merlin were observed in March, April and May, including several sightings on 04 May 2017 of a pair mating and displaying over a probable nest site in deep heather. The nest site was not located, and the pair were not seen again after this date so were assumed either to have failed, or to have nested elsewhere outwith the Paul's Hill boundary.

Potential disturbance/displacement effects

8.4.61 At least one pair of merlin have historically nested at Paul's Hill regularly; with the exception of 2009 there have been observations of pairs exhibiting breeding behaviour every year from 1991 to 2013, although no nests have been located since 2007. Prior to 2013, the last confirmed successful breeding attempt was in 2006. In 2013, two juveniles were sighted with the female in July so it was assumed breeding was successful even in the absence of a confirmed nesting location. The lack of breeding evidence and relatively low level of merlin activity recorded within the survey area in 2014 and 2015 suggests that in these years the birds may have nested elsewhere nearby and were largely making use of survey area for occasional foraging.

8.4.62 There is a possibility that nesting and foraging merlin may be disturbed or displaced during construction and operation of the proposed Paul's Hill II Wind Farm. However, given the extensive alternative habitat available both within the site and in the wider area, and evidence that pairs have continued attempting to breed at the site since the construction of the existing wind farm, including within 500 m of an operational turbine in 2007, it is considered that potential disturbance/displacement impacts will be **short-term**, of **minor magnitude,** and **not significant** for the local merlin population.

8.4.63 Although densities of 5-6 pairs /100 km^2 have been recorded in North-east Scotland, many apparently suitable moorland areas hold no breeding merlin. In common with many raptor species they have historically been subject to persecution, and it is also considered likely that over-burning of heather on moorland is likely to have a negative effect on breeding success[48]. As such, there is also the potential to achieve beneficial effects for this species at Paul's Hill via effective habitat management measures.

8.5 MITIGATION

8.5.1 Although the proposed Paul's Hill II Wind Farm is not predicted to have a significant effect on any of the ornithological features, specific embedded mitigation is proposed for hen harrier, merlin and black grouse as there is the potential for moderate-minor disturbance/displacement impacts to these species. Embedded mitigation will therefore minimise the potential negative effects of disturbance and will ensure compliance with the WCA (1981) as amended, as well as potentially providing positive effects in the longer term.

8.5.2 No other specific mitigation is required although various measures will be implemented to ensure compliance with legislation, and to follow best practice guidance and consultation recommendations with regard to breeding birds. Furthermore, it is proposed that a comprehensive OMP is implemented to monitor the baseline bird community during and after construction. These measures are described below, and summarised in Table 8.18 below.

Mitigation by Design (Embedded Mitigation)

8.5.3 The principal way in which the impact of the proposed Paul's Hill II development has been minimised has been through consideration of ecological and hydrological constraints in both site location and turbine layout. As detailed in Chapter 7: Ecology and Chapter 9: Geology, Hydrology and Hydrogeology of this ES, considerable effort has been made to site the proposed turbines away from areas highlighted as being of ecological or hydrological importance, including areas of deep peat. The proposed turbine layout has also been amended to take consideration of the importance of the ridge running from the Forkins to Altvounnie for hen harrier. One turbine (Turbine 1) is now proposed to be sited in the HMA to the north of the main access track. However, due to primarily comprising blanket bog, this area of the HMA is used much less frequently by hen harrier and merlin for either nesting or hunting. As such inclusion and protection in the HMA of more frequently used habitats at the south of the site, in the vicinity of current favoured nesting areas, may be of more benefit.

Construction

8.5.4 All relevant construction phase embedded mitigation measures, such as appointment of an Ecological Clerk of Works (ECoW) during the construction phase, would be implemented through a Construction Environmental Management Plan (CEMP), which will be agreed with the local planning authority (LPA) in consultation with SNH and SEPA. This could be secured through planning condition, such as 7.4 of the existing Paul's Hill consent.

[67] McCluskie, A., Sansom, A. and Roos, S. 2017. A Circus of Uncertainty; Collision Risk and Hen Harriers. Presentation at CWW 2017, available at http://cww2017.pt/images/Congresso/presentations/oral/CWW17_talk_S06_4_McCluskie%20et%20al.pdf

[68] Ewing, S.R., Rebecca, G.W., Heavisides, A., Court, I., Lindley, P., Ruddock, M., Cohen, S. & Eaton, M.A. 2011. Breeding status of the Merlin *Falco columbarius* in the UK in 2008. Bird Study 58: 379–389.

Embedded mitigation for hen harrier and merlin

8.5.5 A species protection plan (SPP) will be produced; this plan will detail specific embedded mitigation measures required for hen harrier and merlin prior to and during construction, particularly in the vicinity of historic nest sites or suitable nesting habitat. This could be secured through planning condition, such as 7.4 of the existing Paul's Hill consent. Measures could potentially include removal of suitable nesting heather within 500 m of proposed infrastructure during the winter prior to the commencement of construction, to reduce the attractiveness of these areas to prospecting hen harrier and merlin following SNH guidance[17]. Surveys for Schedule 1 raptors will be undertaken prior to construction, following Hardey *et al*., (2013), should construction be proposed during the breeding season within 1 km of any suitable habitat. Should breeding hen harrier or merlin be identified during pre-construction surveys, a suitable species-specific exclusion zone around the breeding site will be installed following guidance[18]. The effectiveness of this exclusion zone will be monitored by the ECoW and be reduced/increased if deemed appropriate.

Embedded Mitigation for black grouse

8.5.6 Black grouse could potentially be affected by moderate disturbance/displacement during construction, specifically during the spring lekking period. If operations during this period are minimised or restricted, for example restricting works around the hours of dawn and dusk in the areas closest to the leks, this impact can be minimised. All known black grouse leks located in the vicinity of the proposed construction works will be monitored for breeding activity prior to construction, and any behaviour indicating new breeding territories will be recorded and monitored. Measures to prevent disturbance to breeding black grouse, for example an exclusion zone of 150 m[18] around any active nest locations, would be included in the SPP and would be overseen during construction by the ECoW.

Residual Impacts

8.5.7 Following implementation of the embedded mitigation measures outlined above, potential effects due to disturbance/displacement are predicted to be of negligible magnitude and therefore not significant for black grouse, hen harrier or merlin.

Legal Compliance Regarding Breeding Birds

8.5.8 Under the WCA (1981) as amended it is an offence, with only limited exceptions, to:

- Intentionally or recklessly take, interfere with, damage or destroy the nest of any wild bird whilst it is in use or being built (applies year round for nests of birds included in Schedule 1A);
- Obstruct or prevent any wild bird from using its nest;
- Intentionally or recklessly take, interfere with or destroy the egg of any wild bird;
- Intentionally or recklessly disturb any wild bird listed on Schedule 1 while it is nest building, or at (or near) a nest containing eggs or young, or disturb the dependent young of such a bird;
- Intentionally or recklessly harass any wild bird included in Schedule 1A; or
- Knowingly cause or permit any of the above acts.

8.5.9 Best practice will be necessary to reduce the possibility of illegal damage, destruction or disturbance to occupied bird nests during the construction phase. This will be implemented via timing of works, pre-construction surveys, and the use of an ECoW; details will be provided in the CEMP.

8.5.10 If site clearance and construction activities are required to take place during the main bird breeding season, from mid-March-August inclusive, pre-commencement survey work will be required to inform appropriate measures to ensure that nest destruction and disturbance to breeding birds are avoided. Where applicable, construction will not take place within disturbance buffer zones (to be agreed with SNH) for certain sensitive species during the breeding season. Details will be provided in the CEMP.

Ecological Clerk of Works (ECoW)

8.5.11 An independent ECoW will be appointed prior to the commencement of construction, and will be present on site during enabling works and throughout the construction period. They will be a suitably experienced individual, whose role will be to ensure that all works are carried out in accordance with environmental legislation and best practice in order to protect breeding birds on site.

8.5.12 Prior to the start of construction/the bird breeding season, contractors will be made aware of the ornithological sensitivities within the proposed Development Area (particularly with regard to the potential presence of Schedule 1 breeding species).

8.5.13 The ECoW will carry out pre-construction survey checks during the bird breeding season (mid-March to August, inclusive) immediately prior to vegetation stripping or excavation works to check for the presence of any breeding birds. Any active nests found will be cordoned off to a suitable distance for the species concerned (in line with appropriate guidance) and construction operations delayed within the cordon until the young have fledged and/or the nest becomes vacant. There will be a clear line of responsibility for ensuring these measures are adhered to. This will reduce the possibility of illegal damage, destruction or disturbance to occupied bird nests during the construction phase. Full details of the ECoW's role and responsibilities will be provided in the CEMP, and secured through planning condition.

Operation

Habitat Management Plan

8.5.14 A HMP will be provided, post-consent, subject to consultation with the landowner, SNH, RSPB and the Moray Council. It is proposed that this will be in line with, and complementary to, the existing MMP for the operational Paul's Hill I Wind Farm. One of the turbines for the proposed extension is sited within the area set aside for habitat management (the HMA) under the MMP for the existing wind farm; however, this area to the north of the HMA is primarily blanket bog and therefore not optimal habitat for management measures, such as heather management, which are targeted at improving habitats for hen harrier and merlin. It is also used less frequently by hen harrier and merlin than areas of the site further to the south. In order that there is no net loss of area of habitat set aside to achieve conservation objectives, it would be proposed to enhance protection and management of habitat to the areas within the ownership boundary which are currently preferred by hen harrier for nesting.

8.5.15 Hen harriers are most at risk of collision during activity associated with breeding, e.g. during display flights or when juveniles disperse from the nest[69] [67]. Management prescriptions in the HMP will focus upon reducing the suitability of open habitat for ground nesting raptors (e.g. nesting hen harrier, short-eared owl and merlin) within the immediate vicinity of the proposed Paul's Hill II turbines, as outlined in SNH guidance[16]. Simultaneously, habitat management in areas elsewhere in the site will aim to preserve and promote areas of suitable habitat for nesting and foraging for these species. Proposals for monitoring of habitat condition and prey species availability will also be included in the HMP. This could be secured through planning condition, such as 7.4 of the existing Paul's Hill consent.

Ornithological Monitoring Plan

8.5.16 The OMP will detail surveys to assess the efficacy of measures outlined in the HMP and species-specific embedded mitigation outlined above, in order to allow for adaptive management and maximise the effectiveness of the HMP in achieving its objectives. It is proposed that monitoring would be undertaken at reasonable intervals throughout the lifespan of the proposed extension. In addition, the OMP would contain an operational-phase

[69] Madders, M. 1996. Precognition relating to Hen Harriers for the proposed Windcluster at Beinn Churlaich, Laggan Estate, Isle of Islay. Wind Cluster Ltd.

breeding bird protocol detailing measures to be undertaken in the event of sensitive species nesting in locations where there may be operational activities.

Decommissioning

8.5.17 Mitigation of decommissioning activities should follow that proposed for the embedded mitigation of construction activities, including pre-decommissioning surveys and ecological supervision of activities.

8.6 SUMMARY OF EFFECTS

8.6.1 The magnitude of pre-mitigation effects and the magnitude and significance of residual effects on each IOF during the construction and operation phases, before and after embedded mitigation, is detailed in Table 8.18 below. The embedded mitigation measures are expected to reduce the magnitude of residual effects for all IOFs to which they apply, in the short and long-term. Residual significance for all IOF's once embedded mitigation is implemented is considered to be **Not Significant**.

Table 8.18: Summary of predicted impacts of the proposed development on Important Ornithological Features

IOF	Value of Site to IOF	Potential pre-mitigation effect	Magnitude of potential pre-mitigation effect	Duration of potential pre-mitigation effect	Specific embedded mitigation measures	Magnitude of residual effect	Residual significance	Comments
Construction/ decommissioning impacts								
Hen harrier	National	Displacement/ disturbance (breeding)	Minor	Short-term	SPP. Removal of heather suitable for nesting in the vicinity of turbine locations prior to the start of the breeding season. Pre-commencement surveys for breeding pairs during breeding season. ECoW presence during construction. Should territories be located within 750 m of construction works, establishment of appropriately sized exclusion zone to minimize potential disturbance.	Negligible	Not significant	A measurable effect on the local, regional or national population is considered to be highly unlikely.
Merlin	Regional	Displacement/ disturbance (breeding)	Minor	Short-term	SPP. Removal of heather suitable for nesting in the vicinity of turbine locations prior to the start of the breeding season. Pre-commencement surveys for breeding pairs during breeding season. ECoW presence during construction. Should territories be located within 500 m of construction works, establishment of appropriately sized exclusion zone to minimize potential disturbance.	Negligible	Not significant	After mitigation, a measurable effect on the local or regional population is considered to be highly unlikely.
Black grouse	Regional	Displacement/ disturbance (lekking and breeding)	Moderate	Short-term	SPP. Pre-commencement surveys for leks and/or nests if construction commences during the black grouse breeding season. ECoW presence during construction. Should leks be located within 750 m of construction works, establishment of appropriately sized exclusion zone to minimize potential disturbance. Restricted construction works around the hours of dawn and dusk in the vicinity of leks.	Negligible	Not significant	After mitigation, a measurable effect on the local or regional population is considered to be highly unlikely.
Operational impacts								
Hen harrier	National	Displacement (one breeding pair)	Moderate	Short- to medium-term	HMP proposed to ensure extent of suitable nesting habitat is enhanced and maintained elsewhere in the site, along with OMP to ensure management remains adaptive.	Negligible	Not significant	After mitigation, a measurable effect on the local, regional or national population is considered to be highly unlikely, with beneficial effects of habitat management expected in the longer term.
		Collision	Minor	Short-term to permanent	HMP proposed, to ensure this species is not attracted to the wind farm during periods when it is most susceptible to collision, along with OMP to ensure management remains adaptive.	Negligible	Not significant	After mitigation, a measurable effect on the local, regional or national population is considered to be highly unlikely.
Merlin	Regional	Displacement/ disturbance (breeding)	Minor	Short-term	HMP proposed, to ensure extent of suitable nesting habitat is enhanced and maintained elsewhere in the site, along with OMP to ensure management remains adaptive.	Negligible	Not significant	A measurable effect on the local or regional population is considered to be highly unlikely, with beneficial effects of habitat management expected in the longer term.

Black grouse	Regional	Displacement/ disturbance (lekking and breeding)	Negligible	n/a	None required	Negligible	Not significant	A measurable effect on the local or regional population is considered to be highly unlikely.
Pink-footed goose	Local	Collision (wintering)	Negligible	n/a	None required	Negligible	Not significant	A measurable effect on the local, regional or international population is considered to be highly unlikely.
Curlew	Local	Collision	Negligible	n/a	None required	Negligible	Not significant	A measurable effect on the local population is considered to be highly unlikely.

8.7 CUMULATIVE EFFECTS

8.7.1 The following section assesses the predicted cumulative effects on ornithological features from the proposed Paul's Hill II Wind Farm along with all other developments within an appropriate zone of influence of Paul's Hill II, following SNH guidance[6].

8.7.2 Cumulative assessments may be complicated by availability of EIAR/ES chapters and Appraisals for consented developments and, where this information is available, survey periods and methods may differ between sites. Furthermore, some wind farms may have been in existence for many years, and thus contemporary data may not be available.

8.7.3 All existing, consented and submitted developments (including wind energy developments, overhead power lines and land management practices) were considered following SNH guidance[6]. As per the guidance, wind developments of fewer than three turbines were excluded due to the problems associated with finding appropriate data for developments of this size. Information for informing the CIA was available from five operational wind farms, two consented wind farms and one wind farm for which planning applications have been submitted. No ESs were available for a further three wind farms (Berry Burn, Meikle Hill and Hill of Towie I), and no data were found for other kinds of relevant development (such as power lines); thus cumulative totals reflect minimum values only.

8.7.4 SNH guidance[6] states that assessments should focus on the most significant cumulative effects and conclude with a clear assessment of those which are likely to influence decision making. The context in which cumulative effects are considered depends upon the ecology of the species in question. For example, for breeding Schedule 1 raptors it may be appropriate to consider the effects on the local population as identified in the assessment in the context of any planned wind farms in the immediate vicinity which have the potential to cause additional displacement. It may be considered that breeding pairs will move into adjacent suitable habitat when the proposed development is considered in isolation, when in reality, this land may be unavailable due to consent of another proposed project.

8.7.5 The main target species recorded within the Study Areas for which cumulative impacts may occur are as follows:

- Black grouse;
- Hen harrier; and
- Merlin.

8.7.6 These species are receptors of regional or higher value that have been recorded regularly within the Study Area. All three species were considered to be at negligible post-mitigation risk of disturbance/displacement to areas outwith the ownership boundary or immediate surroundings, and as such it is highly unlikely that there will be a cumulative effect with other developments. However, hen harrier has been identified by the Scottish Windfarm Bird Steering Group (SWBSG) as priority species for consideration in CIA for Scottish onshore wind farms[70], and as such CIA has been carried out for hen harrier, along with the other two species for which pre-mitigation negative effects may occur, in order to ensure robust consideration is given to all possible impacts of the proposed development.

8.7.7 Hen harrier may range quite widely, particularly during dispersal of juveniles and when migrating from breeding to wintering sites. However, it would be impossible to predict in which directions these movements are most likely to occur and therefore difficult to quantify with any accuracy the number of wind farms these birds may encounter whilst travelling over these relatively large distances. As such, ZoI has been used for scoping developments into the cumulative assessment in line with SNH guidance[6]. Therefore, existing, proposed and submitted developments located within a 25 km radius of the proposed Paul's Hill II development area were considered further for collision risk, and within 10 km for disturbance/displacement impacts. Potential cumulative effects are assessed against the relevant NHZ population estimates, as advocated by SNH.

8.7.8 The residual effect of the individual operational, consented and submitted developments for which information was available and the cumulative residual effect on each of the target species most likely to be affected by cumulative impacts (as listed above) is described in Table 8.19 and 8.20 below.

8.7.9 No significant cumulative disturbance/displacement or collision effects were concluded for any target species.

[70] Humphreys, E.M., Marchant, J.H., Wilson, M.W. and Wernham, C.V. 2015. Methods and definitions used for species dossiers: Project 1403. SWBSG Commissioned Report No. 1403.

Table 8.19: Cumulative Impact Assessment for collision risk to hen harrier with existing, proposed and submitted wind farm developments located within a 25 km radius of the proposed Paul's Hill II Wind Farm

Development	ES available?	Number of turbines	Collision risk to hen harrier
Paul's Hill II (the Development)	N/A	7	**Predicted mortality of 0.13 birds per annum using 99% avoidance rate. No significant adverse effect predicted.**
Paul's Hill I (operational)	Yes	28	Predicted mortality of 0.02 birds per annum. Operational monitoring has shown hen harrier to show good avoidance of the turbines, and there have been no known collisions despite birds breeding and hunting in close proximity to the wind farm.
Berry Burn (operational)	No	29	No species-specific data. No target species considered to be at high risk of collision with the turbines, so only low magnitude impacts predicted. Given the proximity to Paul's Hill and the similarity in the habitats present to the south of the wind farm, it is likely that hen harrier are present in the vicinity of Berry Burn, but there have been no reported collisions. Berryburn HMP includes measures to enhance the habitat for raptors and black grouse, including moorland management measures (cutting/burning)[71].
Meikle Hill (consented)	No	6	No data. Hen harrier are not mentioned in the non-technical summary. Satellite imagery shows habitats present to be of low suitability for hen harrier.
Rothes I (operational)	Yes	22	CRM not conducted. Collision risk assessed as being low/negligible, and therefore not significant. Hen harrier are occasionally observed hunting during operational monitoring for Rothes I. There is suitable habitat for hen harrier present and historic breeding records from the study area.
Rothes II (operational)	Yes	18	Predicted mortality of 0.006 birds per annum using 95% avoidance rate. No significant adverse effect predicted. Suitable habitats for hen harrier present in the vicinity, but only one flight recorded since 2012 during operational monitoring.
Kellas (operational)	Yes	4	A low number of hen harrier flights recorded, but none at CRH so CRM not conducted. Suitable habitats for hen harrier present, but no breeding records.
Hill of Glaschyle (operational)	Yes	12	Only one hen harrier flight recorded; CRM not carried out. Impacts predicted to be negligible. Satellite imagery shows habitats present to be of low suitability for hen harrier.
Cairn Duhie (consented)	Yes	20	Five hen harrier flights. No flights at CRH in the CRZ, so CRM not carried out. Suitable habitats for hen harrier present, but no breeding records within 2 km.
Dorenell variation & extension (submitted; supersedes 2008 consented development)	Yes	63	Not recorded in at CRH in the CRZ, so CRM not carried out. Only three flights recorded during flight activity surveys. There is suitable habitat for hen harrier present and historic breeding records from the study area. Pair observed displaying offsite during 2013 survey work but no further evidence of breeding. HMP proposed, including heather management measures targeted at golden eagle which will also benefit hen harrier, although increased presence of golden eagle at the site would make hen harrier occurrence less likely. Measures to minimise collision risk to foraging raptors within and adjacent to the wind farm also proposed.
Hill of Towie I (operational)	No	21	No data. Satellite imagery shows suitable habitat for hen harrier present, but not extensive.
Hill of Towie II (consented)	Yes	16	No adverse effects predicted. Only two flights recorded and CRM not carried out. Satellite imagery shows habitats present to be of low suitability for hen harrier.
Cumulative Effect	**N/A**	**Max. total: 246**	Cumulative collision estimate of 0.16 individuals per year, equivalent to 0.89% of the population estimate for NHZ 10 (18 individuals). While, as stated above, this estimate should be considered to represent minimum values due to the lack of information available for some of the developments, it should be noted that, with the exception of Berryburn, the developments for which we have no data are unlikely to support resident hen harrier populations due to a lack of suitable habitat present, and are therefore unlikely to add to this cumulative total. Other sites for which CRM was not carried out showed very low levels of hen harrier flight activity, therefore risk of collision for this species was considered to be negligible, and there have been no reported collisions from the seven developments which are now operational. Data from operational wind farms show that there are only a very small number of known hen harrier collisions in the UK and Ireland, indicating that collisions of this species actually occur only rarely. As such, collision mortality is not predicted to be significant at the population level; therefore **no significant cumulative effect is predicted**.

[71] information from CIA for Cairn Duhie Wind Farm

Table 8.20: Cumulative Impact Assessment for disturbance/displacement risks for the three principal target species with existing, proposed and submitted wind farm developments located within a 10 km radius of the proposed Paul's Hill II Wind Farm

Development	ES available?	Number of turbines	Black grouse disturbance/displacement	Hen harrier disturbance/ displacement	Merlin disturbance/ displacement
Paul's Hill II (the Development)	**N/A**	7	**One lek in 2014 with a maximum count of two males and two leks in 2015 with maximum counts of two and five males, recorded within 750 m of proposed infrastructure. Pre-mitigation disturbance/ localised displacement of up to two leks/seven breeding males, therefore moderate impacts. Following mitigation, negligible disturbance/displacement impacts predicted.**	**One nest in 2014 and two in 2015 within the ownership boundary, all > 1.5 km from proposed infrastructure. However, one historic nest site within 200 m of a proposed turbine would be lost, so potential localised displacement of one breeding pair. There are other areas of suitable habitat elsewhere within and in the immediate vicinity of the ownership boundary, and mitigation applied will ensure there is alternative breeding habitat created and maintained elsewhere within the ownership boundary. Negligible negative effects predicted post-mitigation, with the potential for positive effects due to habitat management.**	**Low flight activity and no breeding recorded during 2014 and 2015. Regular breeding by this species within the ownership boundary, including likely but unconfirmed attempts in 2016 and 2017 recorded for Paul's Hill I. Negligible negative effects predicted post-mitigation, with the potential for positive effects due to habitat management.**
Paul's Hill I (operational)	Yes	28	Two leks to the south of the ownership boundary, along Glen Gheallaidh. No disturbance or displacement predicted.	Only displacement of hen harrier foraging from the wind farm area itself predicted. Medium magnitude disturbance impacts, but considered to be of low significance. Operational monitoring has shown that hen harrier have not been displaced by the wind farm, with them having moved closer to the turbine area in recent years.	One pair bred within the study area. Medium magnitude disturbance impacts predicted, but considered to be of low significance. Operational monitoring has shown that merlin have continued to breed at Paul's Hill I following construction of the wind farm.
Berry Burn (operational)	No	29	A lek of 16 males recorded at the north of the site, > 1 km from the turbines. No disturbance/displacement impacts predicted.	Species-specific data not available. Negligible impacts predicted for target species.	Species-specific data not available. Negligible impacts predicted for target species.
Meikle Hill (consented)	No	6	Recorded at site, but no significant impacts predicted. HMP targeting this species proposed.	No data.	No data.
Rothes I (operational)	Yes	22	Small lek, supporting 1-3 males, located 850 m from the nearest turbine. Low to negligible magnitude effects of disturbance/displacement predicted, therefore not significant.	Two historic breeding locations, but neither in regular use. One is 300 m from the Rothes turbines, the other 3 km. Only expected impact is loss of a small part of their hunting range. Low to negligible magnitude effects of disturbance/displacement predicted, therefore not significant. Hen harrier are occasionally observed hunting during operational monitoring for Rothes I.	Three pairs known to breed regularly within 3 km of Rothes Wind Farm; one nest site 600 m from the nearest turbine had not been used for 6 years. The nearest recently used site is > 1 km from the Rothes turbines. Only expected impact is loss of a small part of their hunting range. Low to negligible magnitude effects of disturbance/displacement predicted, therefore not significant. Operational monitoring has shown that merlin have continued to breed at Rothes following construction of the wind farm.
Rothes II (operational)	Yes	18	A single lek of two males, >1 km from the nearest proposed turbine location (and 900 m from the nearest operational Rothes I turbine location). Moderate disturbance impacts arising from construction were predicted, although it was considered that positive habitat enhancement measures proposed as part of mitigation could help reverse population declines.	Relatively low flight activity recorded (average of 1.19 flights in the core survey area per month) and no nest sites were located within 2 km of the site boundary. Very low impact of construction disturbance predicted, not significant.	Merlin were recorded during baseline surveys, although the nearest territory was >1 km from Rothes II, in the MMA of Rothes I. This pair regularly bred within 350 m of operational Rothes I turbines, so no displacement impacts or loss of pairs during the construction period was predicted. Although some disruption to foraging birds was possible, it was considered that this was likely to be minor, given the amount of available habitat for

			Note that this is the same lek as that recorded for Rothes I, and does not therefore represent an additional two males		hunting merlins within the wider area. Potential impacts resulting from construction were therefore considered to be low and not significant.
Cumulative Effect	**N/A**	**Maximum total turbines: 110**	Cumulative pre-mitigation WCS estimate of potential disturbance/displacement impacts to a minimum of six leks, representing on average a minimum of 28 displaying males (24.6% of the population of NHZ 10). Pre-mitigation cumulative disturbance/displacement effects could therefore be significant at the population level. However, the majority of these leks were sufficiently distant from infrastructure that no disturbance/displacement impacts were predicted, and knowledge from operational monitoring at some of these sites (Paul's Hill I, and Rothes I and II) has validated these predictions, with the leks in these locations persisting after wind farm construction. Post-mitigation cumulative disturbance/ displacement effects are predicted not to be significant at either the population or local level, therefore **no significant cumulative effect predicted.**	Cumulative pre-mitigation disturbance/ displacement estimate; potential displacement of pairs from up to three intermittently used breeding locations. Assuming a WCS that this represents three pairs, this would be equivalent to 16.6% of the population estimate of NHZ 10 (18 pairs). However, none of these territories are in regular use, so each actually represents fewer than one pair. In addition, as one of the historic breeding locations at Rothes was 3 km from the turbines, the likelihood that this pair was displaced by the development is negligible. As such, a more realistic cumulative total is one breeding pair displaced pre-mitigation (5.5% of the population of NHZ 10). However, as noted in the hen harrier species account in Section 8.4, locations of suitable breeding habitat change over time due to natural succession processes and so, even in the absence of mitigation, it is expected that this impact would only be temporary and act over the short to medium term. Furthermore, it is expected that habitat management measures at the site will mitigate and compensate for this loss, ensuring no negative impacts in the longer term. Given pressures facing hen harriers in the wider environment, wind developments and the associated management and monitoring provide relatively safe havens, and have the potential to assist in the conservation of this species when planned sensitively. Cumulative disturbance/displacement effects are predicted not to be significant at the population level, therefore **no significant negative cumulative effect predicted, with the potential for beneficial effects in the longer term.**	Cumulative pre-mitigation disturbance/displacement WCS estimate of six breeding pairs may experience disturbance/displacement effects, equivalent to 46.2% of the population estimate for NHZ 10 (13 pairs). Pre-mitigation cumulative disturbance/displacement effects could therefore be significant at the population level. However, in reality it is likely that there is overlap in the territories recorded for Paul's Hill I and Paul's Hill II, and for Rothes I and Rothes II, and that as such the actual number of pairs potentially affected would be lower. Several of the recorded territories were > 1 km from infrastructure, and in these instances displacement from breeding territories is considered to be unlikely. Merlin have been shown to breed regularly in close proximity to turbines at Rothes I and therefore do not appear to have been displaced by the wind farm. It is expected that habitat management measures at the proposed development will mitigate and compensate for the loss of small quantities of suitable breeding habitat, ensuring no negative impacts in the longer term. Post-mitigation cumulative disturbance/ displacement effects are predicted not to be significant at the population level, therefore **no significant cumulative effect predicted.**

8.8 SUMMARY

An assessment has been made of the predicted significance of effects of the proposed Paul's Hill II Wind Farm development on ornithological interests. This assessment identified no significant effects following embedded mitigation measures, of the proposed development on ornithological interests (following CIEEM guidance[2]). Specific embedded mitigation measures for black grouse, hen harrier and merlin are proposed to minimise the potential effects of disturbance and/or displacement, and to ensure compliance with the Wildlife and Countryside Act (1981) as amended by the Nature Conservation (Scotland) Act (2004). A SPP is proposed and best practice guidance regarding breeding birds will be followed, with an ECoW employed during construction. A HMP targeted at hen harrier and merlin is also proposed, incorporating an OMP to assess the efficacy of measures outlined in the HMP and species-specific embedded mitigation outlined for black grouse, hen harrier and merlin. It is considered that following the implementation of these species specific embedded mitigation measures there will be no significant adverse impacts on the main target species associated with the proposed Paul's Hill II Wind Farm. Furthermore, with the implementation of the proposed management and monitoring measures it is considered that there is the potential for beneficial effects in the medium to longer term, and a continuation of the successful management that has already taken place for the protection of hen harrier and other target species associated with the Paul's Hill I consent.

Document history

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Chapter 9

Cultural Heritage Assessment

Contents

Glossary

Term	Definition
Armlet	A band or bracelet worn round the upper part of a person's arm.
Bothy	A small hut or cottage.
Cairn	A human-made pile (or stack) of stones.
Clearance-cairn	An irregular and unstructured collection of field stones which have been removed from arable land or pasture to allow more effective agriculture and collected into usually a low mound or cairn.
Mill-lade	A channel constructed to carry water that drives a mill wheel
General Terms	
Environmental Impact Assessment	Environmental Impact Assessment (EIA) is a means of drawing together, in a systematic way, an assessment of the likely significant environmental affects arising from a proposed development
Environmental Statement	A document reporting the findings of the EIA and produced in accordance with the EIA Regulations
The Existing Paul's Hill Wind Farm	The 'existing Paul's Hill Wind Farm' refers to the operational Paul's Hill Wind Farm.
The Proposed Development	The proposed Paul's Hill II Wind Farm
The Proposed Development Area	Red line boundary (application area)

List of Abbreviations

List and describe your abbreviations here.

Abbreviation	Description
ACAS	Aberdeenshire Council Archaeology Service
CFA	CFA Archaeology Ltd
CMS	Construction Method Statement
EIA	Environmental Impact Assessment
HER	Historic Environment Record
HES	Historic Environment Scotland
HCHET	Highland Council Historic Environment Team
LVIA	Landscape and Visual Impacts Assessment
ZTV	Zone of Theoretical Visibility

9.1 INTRODUCTION

9.1.1 This chapter considers the likely significant effects of the proposed Paul's Hill II development on cultural heritage (historic environment sites and features, archaeology and built heritage); hereafter referred to as 'heritage assets'. The assessment has been carried out by CFA Archaeology Ltd (CFA) using information provided by Historic Environment Scotland (HES), the Aberdeenshire Council Archaeology Service (ACAS), on behalf of Moray Council, and the Highland Council Historic Environment Team (HCHET).

9.1.2 The specific objectives of the study were to:

- Identify the cultural heritage baseline within and in the vicinity of the proposed Paul's Hill II development area;
- Assess the proposed wind farm development area in terms of its archaeological potential
- Consider the potential effects of the construction, operation and decommissioning of the proposed wind farm development on heritage assets, within the context of the relevant legislation and planning guidance.
- Consider the cumulative effects of the proposed wind farm development in combination with other existing or proposed wind farm developments on heritage assets.

9.1.3 The assessment considers the potential effects on heritage assets within the Paul's Hill II development area and the effect of the proposed wind farm development on the settings of designated heritage assets in the wider landscape.

9.1.4 This chapter is supported by:

- Technical Appendix 9.1: Cultural Heritage Constraints (supported by Figures 9.1a and 9.1b)
- Technical Appendix 9.2: Cultural Heritage Assets in the Wider Study Area, within 10 km of the proposed wind farm development (supported by Figure 9.2)
- Visualisations (Figures 9.3 to 9.9)

9.1.5 Where relevant, cross reference is also made to visualisations provided in Chapter 6: Landscape and Visual Impact Assessment.

9.2 LEGISLATION AND POLICY CONTEXT

9.2.1 The study has been conducted in accordance with the Chartered Institute for Archaeologist's (CIfA) 'Code of Conduct'[1] , and 'Standard and Guidance for historic environment desk-based assessment'[2] and with reference to the relevant statutory and planning framework for cultural heritage.

9.2.2 Legislation relevant to cultural heritage includes:

- Ancient Monuments and Archaeological Areas Act 1979[3];
- Planning (Listed Buildings and Conservation Areas (Scotland) Act 1997 (as amended by Historic Environment Scotland (Amendment) (Scotland) Act 2011)[4]; and
- Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2008.[5].

9.2.3 The primary planning policy and guidance at the national level comprises:

- National Planning Framework (NPF 3)[6];
- Scottish Planning Policy (SPP) (2014)[7];
- Historic Environment Scotland Policy Statement (HESPS) (2016)[8]; and
- Planning Advice Note 2/2011: Planning and Archaeology (PAN 2/2011)[9].

9.2.4 At the local level, planning policy and guidance is set out in the Moray Local Development Plan (2015)[10].

9.2.5 Relevant policies for cultural heritage interest in the LDP, applicable in the case of the proposed wind farm development are:

- Policy BE1: Scheduled Monuments and National Designations
- Policy BE2: Listed Buildings
- Policy BE3: Conservation Areas
- Policy ER1 Renewable Energy Proposals

9.2.6 The LDP also includes Supplementary Guidance (SG). Relevant SG includes:

- SG Climate Change

9.2.7 Relevant guidance for cultural heritage interests and considered in the assessment includes:

- Historic Environment Scotland (2016) 'Managing Change in the Historic Environment: Setting'[11];
- Highland 'Historic Environment Strategy' (2013)[12];
- Moray Council Climate Change Supplementary Guidance (2015)[13];
- Moray Onshore Wind Energy Guidance 2017[14].

9.3 SCOPING AND CONSULTATION

9.3.1 Consultation was undertaken with HES as part of the Scoping process. Post scoping consultation was carried out by email and letter with HES, ACAS and HCHET, to obtain further advice and to agree viewpoints for assessment of effects on the settings of cultural heritage assets.

9.3.2 Table 9.1 (below) summarises the responses received relevant to the cultural heritage assessment.

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[1] Chartered Institute for Archaeologists (CIfA) (2014) 'By-Laws: Code of Conduct, Chartered Institute for Archaeologists, Reading.

[2] Chartered Institute for Archaeologists (CIfA) (2017) 'Standard and guidance for historic environment desk-based assessment', Chartered Institute for Archaeologists, Reading.

[3] HM Government (1979) Ancient Monuments and Archaeological Areas Act 1979 (reprinted 1996), HMSO, London.

[4] Scottish Government (2008) Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2008, Edinburgh.

[5] HM Government (1997) Planning (Listed Buildings and Conservation Areas (Scotland) Act 1997, HMSO, London.

[6] Scottish Government (2014) National Planning Framework for Scotland 3, Edinburgh.

[7] The Scottish Government (2014) Scottish Planning Policy

[8] Historic Environment Scotland (2016) Historic Environment Scotland Policy Statement June 2016

[9] Scottish Government (2011) Planning Advice Note (PAN) 2/2011: Planning and Archaeology, Edinburgh.

[10] Moray Council (2015) Moray Local Development Plan (MLDP).

[11] Historic Environment Scotland (2016) 'Managing Change in the Historic Environment – Setting', Edinburgh.

[12] The Highland Council (2013) Supplementary Guidance: Historic Environment Strategy, Inverness.

[13] Moray Council (2015) Moray Local Development Plan, Supplementary Guidance: Climate Change.

[14] Carol Anderson Landscape Associates (2017) 'Moray Onshore Wind Energy Guidance 2017'

Table 9.1: Consultation responses

Consultee	Response	Action
HES EIA Scoping Consultation (letter dated 13.06.2017)	Confirmed that there are no heritage assets covered by HES remit within the Pauls Hill II development area.	Noted
	Advise that there is potential for impacts on the setting of a number of heritage assets in the vicinity of the proposed development and recommend that the assessment pays particular attention to the impacts on: Category A Listed Ballindalloch Castle (LB8449) Ballindalloch Castle Dovecot (LB8450).	The impacts of the proposed wind farm development on the settings of Ballindalloch Castle and Ballindalloch Castle Dovecot are assessed in Section 9.7.
	Advised that there may be potential cumulative impacts on the settings of heritage assets caused by the proposed development in combination with other existing and consented wind farms in the surrounding area and recommended that cumulative impacts are assessed as part of the ES.	The cumulative impact of the proposed wind farm development on heritage assets is assessed in Section 9.7.
HES EIA Post Scoping Consultation response (letter dated 06.10.2017)	Confirmed that they have not identified any heritage assets covered by HES interests beyond 10 km from the development which are likely to receive significant impacts.	The assessment considers (Section 9.7) assets within 10 km of the outermost turbines.
	Confirmed that they are content with the list of proposed visualisations and accepted that the proposed wireline from the upper floor of Ballindalloch Castle, in combination with the photomontage looking towards the building will be adequate to demonstrate the potential impacts.	Visualisations are provided as Figures 9.3 to 9.9.
ACAS Post Scoping Consultation response (email dated 03.10.17)	Confirmed that they were content with the proposed 10 km assessment radius for identifying assets which may undergo indirect (setting) effects.	The assessment considers (Section 9.7) assets within 10 km of the outermost turbines.
	Confirmed that they were content with the proposed cultural heritage viewpoint list.	Noted.
	Confirmed that they were content with the proposed field survey methodology and that survey could be undertaken following design freeze.	Further consultation undertaken to clarify the timing of any requirement for field survey.
ACAS Post Scoping Consultation response (email dated 25.10.17)	Confirmed that, given the low archaeological potential of the site, they were content that field survey that survey could be undertaken post consent as a planning condition	Field survey requirements are addressed in Section 9.8 (Embedded Mitigation)
HCHET Post Scoping Consultation response (email dated 17.10.17)	Confirmed that they were content with the proposed cultural heritage viewpoints	Noted.

9.4 METHODOLOGY

Study Area

9.4.1 Three study areas were used for the assessment:

- The Inner Study Area (Figure 9.1a): The Paul's Hill II development area has been used for the identification of heritage assets and historic landscape features that could be directly affected by the proposed wind farm development. Figure 9.1a shows the proposed wind farm development layout and the locations of heritage assets identified and they are described in the gazetteer (Technical Appendix 9.1.).
- A corridor extending 50m either side of the development area for the off-site access and grid connection routes (Figure 9.1b). The character of the heritage assets identified along the routes is described in the gazetteer (Technical Appendix 9.1.)
- The Wider Study Area (Figure 9.2): a zone extending to 10 km from the outermost turbines defines the study area for the identification of heritage assets whose settings may be affected by the proposed wind farm development. The study area extent was agreed by statutory consultees as being appropriate and no assets beyond 10 km were identified, either by the consultees, or through preliminary assessment of the 40 km blade tip ZTV as requiring inclusion in the assessment. Figure 9.2 shows the Paul's Hill II Wind Farm, together with the blade tip height ZTV and the locations of heritage assets within 10 km from which there could be theoretical views of the turbines and which are included in the assessment. A list of these heritage assets is provided in Technical Appendix 9.2, which also provides a tabulated summary assessment of the predicted impacts on their settings on a case-by-case basis. Figure 9.2 also shows the locations of other cumulative developments within the 10 km study area.

Baseline Data Collection

Desk-based Assessment

9.4.2 The following information sources were consulted as part of the desk-based assessment:

- Historic Environment Scotland's GIS spatial data warehouse (HES 2017a)[15]: provided up-to-date information on the locations and extents of Scheduled Monuments, Listed Buildings, Inventory status Gardens and Designed Landscapes, Inventory status Historic Battlefields and Conservation Areas.
- The Moray Council Sites and Monuments Record (SMR): provided detailed database extract of heritage assets both within and in the vicinity of the proposed wind farm development area.
- The online Historic Environment Scotland database (Canmore) (HES 2017b)[16]: additional information to that provided in the SMR.
- Map Library of the National Library of Scotland: Ordnance Survey maps (principally 1st and 2nd Edition), and other published historic maps were examined to provide information on sites of potential heritage value and on historic land use development.
- Modern aerial photographic imagery available through GoogleEarth™and Bing™.
- Relevant bibliographic references and on-line historic research resources: consulted to provide background and historic information (including Original ES for Paul's Hill WF[17], Kirby 2004a[18], Kirkby 2004b[19] Statistical Accounts of Scotland (Grant 1792[20]; Gordon 1845[21]).
- The Historic Land-use Assessment Data for Scotland (HLAmap) (HES 2017c)[22]: for information on current and historic land-use.
- The Scottish Palaeoecological Archive Database (SPAD) (Cole et al 1998):[23] consulted for information on sites that may provide palaeoenvironmental and palaeoecological data within the proposed wind farm development area.

Walkover Field Survey of Inner Study Area

9.4.3 No field survey has been carried out to date. It was agreed through post-scoping consultation with ACAS in October 2017 that the proposed wind farm development area has a low archaeological potential. It was also agreed that, provided a thorough desk-based assessment was undertaken, any requirement for field survey could be carried out post-consent under a planning condition if it was deemed required.

Site Visits to Key Heritage Assets in Wider Study Area

9.4.4 Field visits were undertaken to heritage assets in the Wider Study Area on 27th September 2017 in order to assess their baseline settings. The baseline setting of each relevant receptor or related group of receptors has been characterised on a case-by-case basis, based upon its properties and location, and takes into account the factors set out in guidance issued by Historic Environment Scotland (i.e. the location and orientation of the site; importance of views of, or from, principal facades; the importance, if applicable, of designed settings; and, any obvious views or vistas).

9.4.5 The baseline setting of the heritage assets is set out in Technical Appendix 9.2, which also contains a summary of the predicted impacts.

9.5 ASSESSMENT OF POTENTIAL EFFECTS

9.5.1 The effects of the proposed wind farm development on heritage assets have been assessed on the basis of their type (direct effects, impacts on setting and cumulative effects) and nature (beneficial, neutral or adverse). The assessment takes into account the relative sensitivity of the heritage asset and its setting and the magnitude of the predicted impact.

Assigning Heritage Sensitivity to Assets

9.5.2 The assessment of sensitivity to change of heritage assets reflects the relative weight given to them in HESP and SPP. Table 9.2 summarises the relative sensitivity of heritage assets which are relevant in the context of this assessment.

Table 9.2: Sensitivity of heritage assets

Heritage Sensitivity	Definition
High	Assets of national importance, including:
	Scheduled Monuments and sites proposed for scheduling
	Category A Listed Buildings
	Inventory status Garden and Designed Landscapes
	Undesignated archaeological sites and areas of national importance
Medium	Assets of regional importance, including:
	Category B Listed Buildings
	Conservation Areas
	Undesignated archaeological sites and areas of distinctive regional importance
Low	Assets of local importance, including:
	Category C Listed Buildings
	Archaeological sites and areas of local importance
	Unlisted buildings and townscapes with local (vernacular) characteristics
Negligible	Assets of little or no importance, including:
	Sites of former archaeological features
	Unlisted buildings of minor historic or architectural interest
	Poorly preserved examples of particular types of feature
	Artefact find-spots

[15] Historic Environment Scotland (2017) GIS download [online]. Available from http://portal.historicenvironment.scot/spatialdownloads [Accessed: September 2017]

[16] Historic Environment Scotland (2017) National Record of the Historic Environment Database (Canmore) [online]. Available from: http://jura.rcahms.gov.uk/PASTMAP/start.jsp [Accessed: September 2017]

[17] Natural Power (2001) Planning Application for the Proposed Wind Farm at Paul's Hill, Moray: Environmental Statement, Volume 1 of 3, September 2001.

[18] Kirkby, M (2004a) Proposed Windfarm, Paul's Hill, Moray: Archaeological Assessment, CFA Archaeology Ltd, Report No. 889.

[19] Kirkby, M (2004b) Proposed Windfarm, Paul's Hill, Moray: Archaeological Watching Brief and Excavations, CFA Archaeology Ltd, Report no. 965.

[20] Grant, F (1792) Knockando, Country of Elgin, Old Statistical Accounts (OSA), Vol. IV, 1792 [online]. Available from: http://stataccscot.edina.ac.uk/static/statacc/dist/viewer/osa-vol4-Parish_record_for_Knockando_in_the_county_of_Elgin_in_volume_4_of_account_1/ [Accessed October 2017].

[21] Gordon, G (1845) Knockando, County of Elgin, New Statistical Accounts (NSA), Vol, XIII, 1845 [online]. Available from: http://stataccscot.edina.ac.uk/static/statacc/dist/viewer/nsa-vol13-Parish_record_for_Knockando_in_the_county_of_Elgin_in_volume_13_of_account_2/ [Accessed October 2017].

[22] Historic Land-Use Assessment Data for Scotland (HES 2017c) HLAMap [online]. Available from: http://hlamap.org.uk/ [Accessed September 2017]

[23] Coles, G.M., Gittings, B.M., Milburn, P. and Newton, A.J. (1998) Scottish Palaeoecological Archive Database [online]. Available from: http://www.geo.ed.ac.uk/spad/ [Accessed September 2017]

Assessment of Direct (Construction) Effects

9.5.3 Criteria for assessing magnitude of direct (construction phase) effects, which measures the degree of change to the baseline condition of a heritage asset that would result from the construction of one or more elements of the proposed wind farm development, are presented in Table 9.3.

Table 9.3: Magnitude of direct (construction) effects

Magnitude of Impact	Definition
High	A fundamental change to the baseline condition of the heritage asset, leading to total or major alteration of character.
Medium	A material, partial loss or alteration of character.
Low	A slight, detectable, alteration of the baseline condition of the asset.
Negligible	A barely distinguishable change from baseline conditions.

9.5.4 The sensitivity of the asset and the magnitude of impact are then used, together with professional judgment, to inform the assessment of the likely significance of the direct effect. Table 9.4 summarises the criteria for assigning significance of a direct effect.

Table 9.4: Matrix for assessing significance of direct effects

Magnitude of Impact ▼	Heritage Sensitivity ► High	Medium	Low	Negligible
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Negligible	Negligible
Negligible	Minor	Negligible	Negligible	Negligible

9.5.5 In the assessment that follows, major and moderate significance levels are considered to be significant for the purposes of the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017[24]. Minor and negligible significance levels are not significant.

Assessment of Indirect (Operational) Effects on Setting

9.5.6 Historic Scotland's guidance document 'Managing Change in the Historic Environment: Setting' (HES 2016), notes that:

"Setting can be important to the way in which structures or places are understood, appreciated and experienced. It can often be integral to a historic asset's cultural significance. Setting often extends beyond the property boundary or 'curtilage' of an individual historic asset into a broader landscape context".

9.5.7 The guidance also advises that:

"if proposed development is likely to affect the setting of a key historic asset, an objective written assessment should be prepared by the applicant to inform the decision making process. The conclusions should take into account the significance of the asset and its setting and attempt to quantify the extent of any impact. The methodology and level of information should be tailored to the circumstance of each case".

[24] Scottish Government (2017) The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017, Edinburgh

9.5.8 The guidance recommends that there are three stages in assessing the impacts of a development on the setting of an historic asset or place:

- Stage 1: identify the historic assets that might be affected by the proposed wind farm development;
- Stage 2: define and analyse the setting by establishing how the surroundings contribute to the ways in which the historic asset or place is understood, appreciated and experienced, and
- Stage 3: evaluate the potential impact of the proposed changes on the setting, and the extent to which any negative impacts can be mitigated.

Criteria for Assessing Sensitivity of Setting to Change

9.5.9 Sensitivity of setting has been assessed by considering two factors:

- The relative weight that statute and policy attaches to the assets and its setting (Table 9.2); and
- The degree to which the baseline setting contributes to the understanding and / or appreciation, and hence value, of the asset (Table 9.5).

Table 9.5: Contribution of setting to understanding and appreciation of a heritage asset

Contribution	Definition
High	A setting which makes a strong positive contribution to the understanding and/or appreciation of the siting and/or historical/archaeological/architectural context of a heritage asset. E.g. a prominent topographic location; surroundings that include related monuments in close association; surroundings that are believed to be little changed from those when the heritage asset was created.
Moderate	A setting which makes some positive contribution to the understanding and/or appreciation of the siting and/or historical/archaeological/architectural context of a heritage asset. E.g. surroundings that complement the siting and appearance of a heritage asset, such as the presence of a feature of the rural past within a more recent farming landscape containing little or no urban or industrial development.
Low	A setting which makes little positive contribution to the understanding and/or appreciation of the siting and/or historical/archaeological/architectural context of a heritage asset. E.g. where surroundings only partially complement the siting and appearance of a heritage asset, such as the presence of a feature of the rural past within a partly urbanised or industrialised landscape.
Negligible	A setting which does not contribute positively to the understanding and/or appreciation of the siting and/or historical/archaeological/architectural context of a heritage asset. E.g. immediate surroundings, such as of a commercial coniferous single species woodland or industrial development, that are not relevant to understanding the context of the heritage asset.

9.5.10 These two criteria have then been combined to assess the overall sensitivity of a setting, as set out in Table 9.6. Assets of negligible sensitivity are excluded from the matrix in Table 9.6 and from the setting assessment, as their settings would not be significantly adversely affected by the proposed wind farm development.

Table 9.6: Sensitivity of setting of an asset

Sensitivity of an Asset ▼	Contribution of Setting ► High	Moderate	Low	Negligible
High	High	Medium	Medium	Low
Medium	Medium	Medium	Low	Low
Low	Medium	Low	Low	Low

Identification of Magnitude of Effect on Setting

9.5.11 The assessment of magnitude of effect has been based on analysis of a blade tip height ZTV, taking into account the distance of the assessed asset from the proposed wind farm development, the number of blade tips theoretically visible and the present baseline setting of each asset. The ZTV model is, however, based on bare-earth surface topography and maximum blade-tip heights; it takes no account of obstructions to intervisibility caused by existing forestry and other vegetation or buildings and other man-made features. Therefore, professional judgment has been used to assess the significance of effects informed by the ZTV.

9.5.12 Where it has been determined that the setting of an asset is such that there is no potential for it to be affected by the presence of the proposed wind farm development, that asset has not be considered further. For the remaining assets, the magnitude of effect on setting was assessed according to the thresholds in set out in Table 9.7.

Table 9.7: Magnitude of effects on setting

Magnitude of Impact	Definition
High	A fundamental material impact obviously changing the surroundings of a heritage asset, such that its baseline setting is substantially or totally altered.
Medium	An impact discernibly changing the surroundings of a heritage asset, such that its baseline setting is partly and materially altered.
Low	A slight, but detectable impact that does not materially alter the baseline setting of the heritage asset.
Negligible	A very slight and barely distinguishable change from baseline conditions.

9.5.13 The significance of an effect on setting depends on both the magnitude of effect (Table 9.7) and the sensitivity of the setting of the asset (Table 9.5). Table 9.8 presents the matrix used to inform the determination of the significance of effects on setting.

Table 9.8: Significance of effects on setting

Magnitude of Impact ▼	Sensitivity of Setting ► High	Medium	Low
High	Major	Moderate	Minor
Medium	Moderate	Moderate	Minor
Low	Minor	Minor	Negligible
Negligible	Negligible	Negligible	Negligible

9.5.14 In the assessment that follows, major and moderate significance levels are considered to be significant for the purposes of the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017[25]. Minor and negligible significance levels are not significant.

Cumulative Effects

9.5.15 The assessment of cumulative effects on heritage assets has been based upon consideration of the impacts of the proposed Paul's Hill II development on the settings of assets with statutory and non-statutory designations within 10 km of the proposed wind farm development in addition to the likely effects of other operational, consented and in planning developments.

9.5.16 Figure 9.2 shows the proposed Paul's Hill II development in its wider landscape context, together with the blade tip height ZTV, the locations of the heritage assets within 10 km of the outermost turbines from which there is predicted theoretical visibility of one or more turbines of the proposed wind farm development and that are included in the assessment, and the locations of other wind energy development in the wider area. The cumulative schemes included in the assessment reflect those agreed with consultees and listed in Chapter 6: Landscape and Visual Impact Assessment.

9.6 BASELINE CONDITIONS

Inner Study Area (Figure 9.1a)

9.6.1 Three heritage assets have been identified within the Paul's Hill II development area. The locations and extents of these are shown on Figure 9.1a and Technical Appendix 9.1 contains a detailed description of each asset together with a classification of its heritage sensitivity. Numbers in bold and in brackets in the following text refer to heritage asset numbers depicted on Figure 9.1a and listed in Technical Appendix 9.1.

Medieval and Later Remains

9.6.2 A farmstead (**Asset 3**), annotated 'Tomintuigle' is depicted on the Ordnance Survey 1st Edition map (1874) comprising an enclosed courtyard steading, two buildings, a mill-pond with mill-dam (**Asset 3a**), and a lengthy mill-lade (**Asset 3b**) extending up to Roy's Hill to the east. The same farmstead continues to be shown on subsequent maps and is still in use today; although, the mill-pond is no longer shown on the 2005 Ordnance Survey 1:10,000 map. The farmstead is considered to be of local heritage importance and **low** sensitivity.

9.6.3 The remains of a former field system (**Asset 2**) have been recorded at Culkaing (Paul's Hill Wind Farm ES 2001[26]; Kirkby 2004a[27]). The field system comprises 21 clearance cairns scattered either side of an existing track leading from Culkaing to Roy's Hill, together with two parallel banks (potentially the remains of an earlier track) and a large stone with drill marks in it. Eight cairns, that lay within the way-leave for the existing Paul's Hill Wind Farm access track, were excavated (Kirkby 2004b[28]) prior to the construction of the track. No securely sealed or datable artefacts were recovered from the cairns during the excavation. However, it is thought that the cairns were likely formed from stones cleared when the existing track at Culkaing was originally constructed and it is considered that they are of medieval or later origins (Kirkby 2004b). The former field system is considered to be of local heritage importance and **low** sensitivity.

[25] Scottish Government (2017) The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017, Edinburgh

[26] Natural Power (2001) Planning Application for the Proposed Wind Farm at Paul's Hill, Moray: Environmental Statement, Volume 1 of 3, September 2001.

[27] Kirkby, M (2004a) Proposed Windfarm, Paul's Hill, Moray: Archaeological Assessment, CFA Archaeology Ltd, Report No. 889.

[28] Kirkby, M (2004b) Proposed Windfarm, Paul's Hill, Moray: Archaeological Watching Brief and Excavations, CFA Archaeology Ltd, Report no. 965.

Modern (20th Century) Structures

9.6.4 A wooden shooting bothy (**Asset 1**), likely to be of 20th century date, was found during field survey in 2004 (Kirkby, 2004a[29]). It is considered to be of lesser heritage importance and **negligible** sensitivity.

Archaeological Potential of Inner Study Area

9.6.5 The Paul's Hill II development area lies within an area of rough upland moorland pasture that ranges from 516 m AOD at the summit of Roy's Hill to around 300 m AOD along the Blarnish Burn valley at the northern edge of the Inner Study Area. It lies within the 'Open Rolling Uplands (11)' landscape character type[30] in which archaeology and the historic environment is not identified as a constraint.

9.6.6 Historically, the land has largely remained as unimproved upland used for pasturage and with settlement at lower elevations. Taking into account the present historic environment record, both within the Inner Study Area and the immediate landscape surrounding it, and the largely upland moorland nature of the landscape, both historically and today, there is some potential for buried archaeological remains, particularly features dating to the prehistoric period, to lie beneath peat deposits.

9.6.7 Peat Depth data indicates that peat accumulation across the Inner Study Area is generally low, with recorded depths ranging from <0.5 m to 1m deep, with few areas of deep peat being present (Chapter 10: Hydrology, Geology and Hydrogeological Assessment, Figure 10.3). In addition, the locations of the proposed turbines lie at elevations between about 350 m AOD and 460 m AOD, within the upland moorland, and this area is unlikely to have been attractive for permanent settlement at any time in the past; the area being above the recorded locations of most of the known heritage assets within the vicinity.

9.6.8 Given the nature of the landscape, the high elevation at which the development is proposed, the general low-levels of peat and the limited land-take required for construction, it is assessed that there is a low probability of encountering archaeological remains within the Inner Study Area.

Heritage Assets along the Proposed Access Route and Grid Connection Route (Figure 9.1b)

9.6.9 Twenty-five heritage assets have been identified along the proposed access and grid connection routes. The locations and extents of these are shown on Figure 9.1b and Technical Appendix 9.1 contains a detailed description of each asset together with a classification of its heritage sensitivity. Numbers in bold and in brackets in the following text refer to heritage asset numbers depicted on Figure 9.1b and listed in Technical Appendix 9.1.

Prehistoric Remains

9.6.10 A hut circle, field system and tumuli (**Asset 28**) is recorded as lying in the area of Tomnaglein Plantation; a commercial forestry plantation to the southeast of Tomfarclas. Some of the tumuli, mounds of earth and stone, were destroyed in 1864 during agriculture and a large part of the field system was recorded in 1967 as having been mutilated or destroyed by forestry and agricultural operations. Over 84 cairns of various sizes (typically, about 6m in diameter and 0.5m high) are located in a field just to the south of Tomnaglein plantation and the hut circle is preserved in an open clearing within the plantation. The remains appear to be those of later prehistoric settlement and agriculture, but it seems probable that at least some of the cairns are prehistoric burial structures. The asset is considered to be of regional heritage importance and **medium** sensitivity.

Medieval and Later Remains

9.6.11 Most of the recorded assets along the proposed access and grid connection routes are buildings of post-medieval date and include farmsteads (**Assets 5**, **8**, **13**, **17**, **23** and **24**) and cottages (**Assets 7**, **9**, **10**, **14**, **18**, **19**, **21**, **25** and **26**).

- Five of the farmsteads (**Assets 5** (shown as area on Figure 9.1b), **8**, **13**, **17** and **24**) survive as occupied properties and one (**Asset 23**) survives as wall footings of the former buildings. As remains of the post-medieval agricultural landscape, either standing buildings of historic character or ruinous remains with some archaeological potential, these are each assessed as being of local heritage importance and **low** sensitivity.
- Two of the recorded cottages (**Assets 10** and **19**) survive as occupied residential properties and one (**Asset 7**) survives as wall footings of the former cottage. As remains of the post-medieval agricultural landscape, either standing buildings of historic character or ruinous remains with some archaeological potential, these are each assessed as being of local heritage importance and **low** sensitivity.
- There are no surviving remains of the other six cottages (**Assets 9**, **14**, **18**, **21**, **25** and **26**) and they are accordingly assessed as being of negligible heritage importance and **negligible** sensitivity.

9.6.12 Other recorded buildings of post-medieval date include two schools (**Assets 4)** (shown as area on Figure 9.1b) and **6**), a railway station (**Asset 15**), a smithy (**Asset 20**) and a Poorhouse (**Asset 22**).

- One of the former schools (**Asset 6**) and the smithy (**Asset 20**) survive as occupied properties; the other school (**Asset 4**) survives only as wall footings and the Poorhouse (**Asset 22**) survives as standing ruins. As remains of the post-medieval agricultural landscape, either standing buildings of historic character or ruinous remains with some archaeological potential, these are assessed as being of local heritage importance and of **low** sensitivity.
- The railway station (**Asset 15**) survives as two standing buildings and the station platform and these remains (platform building and goods shed) are Category B Listed Buildings. As such they are of regional heritage importance and **medium** sensitivity.

Miscellaneous

9.6.13 Other recorded heritage assets include: the find-spot of a Viking sword (**Asset 11**), a railway (**Asset 12**), a bridge (**Asset 16**) and a well (**Asset 27**).

- The Viking sword (**Asset 11**) was recorded as being found when excavating a cutting on the Strathspey Railway (**Asset 12**), near Gortons; it is now in the National Museum of Scotland. The find-spot of an artefact no longer in-situ is assessed as being of negligible heritage importance and **negligible** sensitivity; but it does indicate some possible archaeological potential in the vicinity of the location of its discovery.
- The railway (**Asset 12**), built in about 1860, has been long disused and its former course now forms part of the Speyside Way walking route. The former railway, of which some elements, including the trackbed, survive, is assessed as of local heritage importance and **low** sensitivity.
- Boat Pool Bridge (**Asset 16**), built in 1911, carries the road over the River Spey at Blacksboat. It is recorded in the Aberdeenshire HER as being of regional heritage importance and is accordingly assessed as being of **medium** sensitivity.
- A well (**Asset 27**), recorded on the Ordnance Survey 1st Edition map in what is now the northwest corner of Tomnaglein Plantation, is assessed as being of negligible heritage importance and **negligible** sensitivity.

Heritage Assets within the Wider Study Area (Figure 9.2)

9.6.14 Based on analysis of the blade tip height ZTV, there are four Scheduled Monuments and four Category A Listed Buildings of national importance and of high sensitivity within 10 km of the proposed Paul's Hill II development

[29] Kirkby, M (2004a) Proposed Windfarm, Paul's Hill, Moray: Archaeological Assessment, CFA Archaeology Ltd, Report No. 889.

[30] Moray Onshore Wind Energy Guidance 2017 (p 75)

from which there is predicted theoretical visibility of the proposed turbines. In addition to these, there are 16 Category B Listed Buildings, 11 Category C Listed Buildings and one Conservation Area from which there is predicted theoretical visibility of the proposed wind farm development.

Future Baseline

9.6.15 If the Paul's Hill II Wind Farm was not to proceed, there would likely be no change to the baseline conditions of the various heritage assets and features that presently survive within the Inner Study Area. The current upland moorland landscape would likely continue, limiting the potential for disturbance to historic environment assets, and only natural decay would occur to the surviving remains. Further accumulation of peat deposits across the Inner Study Area would likely occur and any buried deposits within that environment would be preserved.

9.7 IMPACT ASSESSMENT

Direct (Construction) Impacts within the Inner Study Area

9.7.1 Ground breaking activities associated with the construction of the Paul's Hill II Wind Farm (such as those required for turbine bases and crane hardstandings, access tracks, cable routes, construction compounds and proposed borrow pits) have the potential to disturb or destroy heritage assets. Other construction activities, such as vehicle movements, soil and overburden storage and landscaping also have the potential to cause direct, permanent and irreversible impacts on heritage assets. For the full description of construction activates refer to Chapter 4: Description of Development.

9.7.2 The Paul's Hill II Wind Farm layout has been designed to avoid direct impacts on all known heritage assets. No turbines coincide with any recorded heritage assets and all other new infrastructure has avoided the locations of known heritage assets. The proposed main access route would utilise an existing track built to facilitate construction of the existing Paul's Hill Wind Farm and would pass through a former field system (**Asset 2**) at Culkaing and crosses a former mill lade (**Asset 3a**) running from Tomintuigle Farmstead to Roy's Hill that have been recorded previously and addressed during the construction phase for the previous development.

9.7.3 No known heritage assets would be directly affected by the proposed wind farm development but there remains some limited possibility that construction phase excavation could have an adverse effect on any unrecorded, buried archaeological remains present in affected areas.

Direct (Construction) Impacts along the Proposed Access and Grid Connection Routes

9.7.4 There is some potential for direct effects on cultural heritage to arise from works relating to highways upgrading, required for turbine component delivery, and from cabling activities between the wind farm and the grid connection point southeast of Tomfarclas. The standing buildings and former building remains mostly lie outwith the road corridor and are unlikely to receive direct effects from road upgrading and could easily be avoided by grid connection installation works.

9.7.5 There is some potential for cabling works required for the grid connection to have a direct impact on any surviving buried remains where the route passes through the site of the regionally important prehistoric settlement site (**Asset 28**); although the route will be designed to skirt around the woodland edge and to follow the line of an existing track, passing through an area where no remains are known to survive as visible features.

9.7.6 It is anticipated that no known heritage assets would be directly affected by the proposed highways works or cabling works but there remains some limited possibility that those works could have an adverse effect on any unrecorded, buried archaeological remains present in affected areas. Any potential impact on heritage assets will be addressed once a turbine has been selected, the route has been fully assessed and engineering details are known and provided in the Construction Method Statement (CMS).

Operational Impacts (Effects on Settings of Heritage Assets)

9.7.7 The assessment of the operational effects on the settings of heritage assets has been carried out with reference to the layout of the Paul's Hill II Wind Farm and the locations of the cultural heritage assets shown on Figure 9.2. The criteria detailed in Tables 9.5 to 9.8 have been used to assess the nature and magnitude of the effects, which are set out in summary form in Technical Appendix 9.2.

9.7.8 Heritage assets identified by Historic Environment Scotland (see Table 9.1 for details) to have sensitive settings (Category A Listed Ballindalloch Castle and Ballindalloch Castle Dovecot) and additional heritage assets identified during the assessment as being potentially sensitive to development in the surrounding landscape are considered in more detail in the section below.

9.7.9 To aid the assessment of the potential impact on the settings of these sites, photomontage and wireline visualisations (listed in Table 9.9) have been produced to show the predicted visibility of the Paul's Hill II Wind Farm from those locations. These locations are shown for reference on Figure 9.2. Further explanation of the method used in generating these visualisations is set out within Chapter 6: Landscape and Visual Impact Assessment.

9.7.10 The potential operational effects of the proposed Paul's Hill II development on the settings of heritage assets has been assessed against the existing baseline which includes the existing Paul's Hill Wind Farm.

Table 9.9: Cultural Heritage Viewpoints

Asset name and no	Status	Distance to nearest turbine (km)	Visualisation	Figure no	Comments
Lagmore West, Chambered Cairn and Stone Circle (SM340)	Scheduled Monument	6.6	Photomontage	9.3	From a location just southeast of the monument, with the stone circle/cairn in foreground
Lagmore East, Chambered Cairn and Stone Circle (SM339)	Scheduled Monument	6.7	Wireline	9.4	From location of monument
Marionburgh, Chambered Cairn and Stone Circle W of (SM334)	Scheduled Monument	6.7	Wireline	9.5	From location of monument
Knockando Kirkyard, three carved stones (SM1225)	Scheduled Monument	4.9	Wireline	9.6	From location of monument
Ballindalloch Castle (LB8449)	Category A Listed	6.3	Photomontage	9.7	Viewpoint taken from a location southeast of the castle with the castle in the foreground
Ballindalloch Castle (LB8449)	Category A Listed	6.2	Wireline	9.8	From a representative height (12 m) correlating with the watch tower window of the castle

Asset name and no	Status	Distance to nearest turbine (km)	Visualisation	Figure no	Comments
					looking towards the proposed Paul's Hill II development
Ballindalloch Castle, Dovecot (LB8450)	Category A Listed	6.0	Wireline	9.9	From location of monument
Tormore Distillery (LB337)	Category B Listed	5.9	Photomontage	LVIA 6.13a	From entrance to distillery

General Observations

9.7.11 The proposed wind farm development would stand within upland moorland overlooking the River Spey valley and immediately east of the existing Paul's Hill Wind Farm. The blade tip height ZTV (Chapter 6: Landscape and Visual Impact Assessment, Figure 6.1) indicates that the proposed turbines would be theoretically visible in the wider landscape, particularly from the higher slopes to the east and north, and from along the southern slopes of the Spey valley. The proposed Paul's Hill II development would be seen together with those of the existing Paul's Hill Wind Farm, which lies immediately west of the proposed wind farm development (Figure 9.2); the two effectively seen as one turbine cluster.

Scheduled Monuments

Lagmore West Chambered Cairn and Stone Circle (SM340) (Figure 9.3)

9.7.12 This prehistoric chambered cairn and stone circle stands on a north facing slope in scrubland at the edge of an improved pasture field, overlooking the confluence of the River Avon and River Spey to the north. The monument comprises the well-preserved remains of a passage grave encircled by standing stones. Of the stone circle, four stones still remain upright, the stump of a fifth can be seen on the southwest and a fallen stone lies to the south-southeast. The entrance to the cairn, which faces south, is formed by two stones which project from the kerb of the passage grave and the line of the passage, which is still partially lintelled, can be seen within the cairn material.

9.7.13 Open views are afforded from the cairn to the surrounding landscape, particularly to the west, north and east along and out over the River Spey valley, taking in the surrounding farmland and more distant hill slopes. Views to the south are restricted by rising topography. The existing Paul's Hill Wind Farm (8 turbines and 1 blade tip) is visible in distant views to the northwest; the turbines visible spread out along the skyline and framed by surrounding commercial forestry (Figure 9.3). The chambered cairn can be seen in its farmland setting in views from the surrounding landscape, particularly whilst travelling east along the A95, back dropped by commercial woodland.

9.7.14 The setting of the burial cairn is characterised by the farmland in which it stands and out over which views extend. In particular, the setting is defined by the cairn's relationship with the two rivers (the Avon and the Spey) and its location in relation to the confluence of the two. The cairn has a current setting that makes a high contribution to its understanding and appreciation and it is considered that the setting is of **high** sensitivity.

9.7.15 The proposed wind farm development would be present to the northwest of the monument, the nearest proposed turbine being approximately 6.6 km away. The blade tip ZTV and photomontage (Figure 9.3) predicts that there would be theoretical visibility of three turbines (two hubs and one blade tip) from the burial cairn. The wireline shows that these three turbines would be visible beyond the skyline but partly screened by the intervening topography of the Hill of Dalnapot. The proposed turbines would be viewed together with, but slightly separated from, those of the existing Paul's Hill Wind Farm and they would more screened by intervening topography than the existing Paul's Hill Wind Farm (Figure 9.3a). The proposed wind farm development would not be visible in views of the chambered cairn from the A95 public road as it passes on the north and would not affect any other views of or from the cairn.

9.7.16 The burial cairn forms part of a group of similar monuments surviving in the Ballindalloch area and there are potentially contemporary burial cairns/stone circle in the immediate vicinity: in particular the East Lagmore stone circle (**SM339**), approximately 330 m to the east-northeast, and Marionburgh chambered cairn and stone circle (**SM334**), approximately 860 m to the northeast. East Lagmore (**SM339**) is visible standing in farmland in views to the northeast of West Lagmore chambered cairn and it is possible that there was intended intervisibility between the two; there may have also been intended intervisibility between West Lagmore and Marionburgh chambered cairn (**SM334**); however, today this relationship is screened by intervening woodland. The proposed turbines would not be visible within the line of sight between West Lagmore chambered cairn and the East Lagmore stone circle (**SM340**) and would not affect the intervisibility between these two monuments.

9.7.17 It is assessed that the introduction of the proposed Paul's Hill II development would have a predicted impact of no more than **low** magnitude on the setting of Lagmore West Chambered Cairn and Stone Circle, resulting in an effect of **minor** significance (not significant in EIA terms).

Lagmore East Chambered Cairn and Stone Circle (SM339) (Figure 9.4)

9.7.18 This prehistoric chambered cairn and stone circle is located at the edge of an improved pasture field immediately south of the A95 public road. The monument comprises the remains of a stone circle standing on a flat-topped mound of stones thought to be the remains of a Clava-type burial cairn. The mound has been clipped by ploughing on every side and now has a rounded quadrilateral shape in plan. The stone circle may have originally comprised up to 17 orthostats; although today only five stones, three standing and two fallen, survive.

9.7.19 Views are afforded from the cairn to the surrounding landscape; principally to the south along the River Avon valley. Views also extend over part of Ballindalloch Golf Course, which lies to the south of the monument and to the east and west to surrounding hill slopes. These views are though constrained by the topography and by woodland which limits to some degree the monument's relationship with its wider surroundings. Views to the north are particularly limited by the presence of woodland (Dalnihan Wood) on the north side of the A95. The cairn can be seen in its farmland setting in views from the surrounding landscape; particularly whilst travelling along the A95 from the east and west and from the entrance to Ballindalloch Golf Course. There is no visibility of the existing Paul's Hill Wind Farm from the monument; the wind farm being screened by intervening topography and the woodland on the north side of the A95.

9.7.20 The setting of the monument is characterised by the localised farmland landscape within which it stands and out over which views from the cairn extend. The setting is also to some degree defined by the cairn's relationship with the River Avon and, to a lesser degree, with the River Spey and its location in relation to the confluence of the two. The cairn currently has a localised setting that makes a moderate contribution to its understanding and appreciation and it is considered that the present setting is of **medium** sensitivity.

9.7.21 The proposed Paul's Hill II development would be present to the northwest of the monument, the nearest proposed turbine being approximately 6.7km from the monument. The blade tip ZTV and a wireline (Figure 9.4) predict that there would be theoretical visibility of two turbines at hub height from the monument with views of the proposed wind farm development being largely screened by intervening topography. Woodland on the north side of the A95 (Danihan Wood) would also provide full screening of the proposed turbines.

9.7.22 The burial cairn forms part of a group of similar monuments surviving in the Ballindalloch area and there are potentially contemporary stone circles/burial cairns in the immediate vicinity: in particular the West Lagmore chambered cairn and stone circle (**SM340**), approximately 330 m to the west-southwest of the East Lagmore stone circle and Marionburgh chambered cairn and stone circle (**SM334**), present approximately 560 m to the northeast. West Lagmore (**SM340**) is visible standing on an east-facing slope in a pasture field in views to the west from East Lagmore stone circle and it is possible that there was intended intervisibility between the two; there may have also

been intended intervisibility between East Lagmore and the Marionburgh chambered cairn and stone circle (**SM334**); however, today this relationship is screened by intervening woodland. The proposed turbines would not interfere in the line of sight between Lagmore East stone circle and Lagmore West (**SM340**) and would not affect the intervisibility between these two monuments.

9.7.23 The introduction of the proposed Paul's Hill II development would not discernibly alter the character of the landscape in which the Lagmore East Chambered Cairn and Stone Circle stands, and out over which views from it extend. The presence of the proposed turbines would not detract from an appreciation or understanding of the monument and its wider landscape. It is therefore assessed that the proposed wind farm development would have a predicted impact of no more than **negligible** magnitude on the setting of the monument, resulting in an effect of **negligible** significance (not significant in EIA terms).

Marionburgh Chambered Cairn and Stone Circle (SM334) (Figure 9.5)

9.7.24 The remains of this prehistoric chambered cairn and stone circle are situated in a small woodland plantation, enclosed by a drystone wall, approximately 300m west of the River Avon and immediately south of the public access to Ballindalloch Castle. The burial cairn which has been heavily robbed comprises a stony bank that would have once been revetted on both sides by kerbs of boulders with an open courtyard at the centre. Originally a circle of stones surrounded the cairn, but only five stones are now still upstanding.

9.7.25 Views from the cairn are gained to the immediate surrounding farmland and out to surrounding hilltops to the north and west. Wider landscape views to the south and east and restricted by woodland edging the Ballindalloch Castle grounds. The cairn can be glimpsed, through the plantation trees, whilst travelling along the access road to Ballindaloch Castle, from the east and west. There is no visibility of the existing Paul's Hill Wind Farm from the monument; the wind farm being screened by intervening topography and woodland.

9.7.26 The current setting of the cairn is characterised by the plantation in which it stands and the surrounding farmland out over which views from it extend; although these views are limited in extent by the surrounding topography and woodland. The setting is also to some degree defined by the cairn's relationship with the River Avon and, to a lesser degree, with the River Spey and its location in relation to the confluence of the two. The cairn currently has a localised setting that makes a moderate contribution to its understanding and appreciation and it is considered that the present setting is of **medium** sensitivity.

9.7.27 The proposed Paul's Hill II development would be present to the northwest of the cairn, the nearest proposed turbine being c.6.7km from the monument. The blade tip ZTV and a wireline (Figure 9.5) predict that there would be theoretical visibility of three turbines (three tips and two hubs) from the monument; the turbines visible beyond the skyline, partially screened by intervening topography. That visibility would however be further screened by the woodland of the plantation within which the monument stands. At 6.7 km distance the proposed turbines would not affect the immediate woodland setting of the asset nor would they be visually dominant features of the wider surrounding landscape.

9.7.28 The burial cairn forms part of a group of similar monuments surviving in the Ballindalloch area and there are potentially contemporary burial cairns/stone circles in the immediate vicinity: in particularly the West Lagmore chambered cairn and stone circle (**SM340**) and East Lagmore stone circle (**SM339**), both located to the southwest of Marionburgh chambered cairn and stone circle, 860 m and 570 m distant respectively. There may have been intended intervisibility between these monuments; however, today that relationship is obscured by intervening woodland.

9.7.29 It is assessed that the introduction of the proposed Paul's Hill II development would have a predicted impact of no more than **negligible** magnitude on the setting of the Marionburgh chambered cairn and stone circle, resulting in an effect of **negligible** significance (not significant in EIA terms).

Knockando Kirkyard, Three Carved Stones (SM1225) (Figure 9.6)

9.7.30 This monument comprises the remains of three inscribed stones possibly dating to the 9th or 10th centuries. The stones are now built into the wall of Knockando Church graveyard: at the graveyard entrance, between the two entrance gates, and just east of the church. At least two of the stones are believed to have been brought to Knockando from an old burial ground at Pulvrenan, approximately 1.7 km to the southeast and stood in a different part of Knockando graveyard until the 19th century when they were incorporated into the churchyard wall. The stones are generally poorly preserved and the carvings are difficult to make out and can only be appreciated at close quarters.

9.7.31 The current setting of these three carved stones is the churchyard in which they stand. Views to the surrounding landscape are limited by trees and vegetation that edge the graveyard and in any case these outward views are of no relevance to the stones, which are not in their original settings. The stones have a localised setting, restricted to the churchyard, that makes a negligible contribution (not the original position of the stones) to the understanding and appreciation of the stones and it is considered that the setting is of **low** and localised, sensitivity.

9.7.32 The proposed Paul's Hill II development would be present to the west-southwest of the monument, the nearest turbine being approximately 4.9 km from the monument. The blade tip ZTV and a wireline (Figure 9.6) predict that there would be theoretical visibility of all seven turbines (six hubs and one turbine tip). However, views out to the proposed wind farm development from the stones would be screened by Knockando Church which stands immediately southwest of the inscribed stones.

9.7.33 The introduction of the proposed Paul's Hill II development would not affect the localised churchyard setting of the three carved stones and it is assessed that the proposed wind farm development would have a predicted impact of **negligible** magnitude on their setting, resulting in an effect of **negligible** significance (not significant in EIA terms).

Listed Buildings

Category A Listed Ballindalloch Castle (LB8449) (Figures 9.7 and 9.8)

9.7.34 This Category A Listed Building is one of the finest surviving examples of a classic Scottish baronial castle. Originally dating to the 16th century the castle has been, and continues to be, the home of the Macpherson-Grants; it is still occupied by the family. The castle and its gardens are open to the public from Easter to September and are popular with visitors.

9.7.35 The three-storey castle is situated on the banks of the River Avon a short distance from its confluence with the River Spey, standing in a small designed landscape comprising open parkland edged with mixed woodland. The original Z-plan tower house was probably built by John Grant in 1540, additional wings were added during the 18th century and the castle was then remodelled in 1850 by Moray architect Thomas MacKenzie to a modern Victorian mansion.

9.7.36 Today the castle is approached from the east via a long drive that runs through parkland that forms part of the designed landscape that surround the castle, and ends in a small car park at the castle's dovecot (**LB8449**), just north of the castle. The gardens were principally laid down in the second half of the 19th century, following the remodelling of the castle. Other elements of the designed landscape include: Category B Listed Walled Garden and Bothy (**LB8459**) and the former Mains Farm Stables and Cartshed (**LB8451**) along with the Category C Listed Gardener's cottage (**LB8458**), all standing to the north of the castle in areas of parkland; Category B Listed Bow Cottage (**LB8482**) and the former Stables and Stable Cottages (**LB8455**), to the east; Category B Listed General James Grant Mausoleum (**LB8457**), to the northeast, standing in an area of woodland, and the Category B Listed Gate Lodge (**LB8461**), the original 19th century entrance to the castle, standing next to the River Avon southeast of the castle.

9.7.37 The main elevations of the house are oriented towards the northwest and the southeast: both overlooking surrounding parkland. The original entrance to the house was on the northwest-facing elevation, but this was

recast to the south corner of the castle during the remodelling in 1850 and today the main elevation (front elevation) of the house faces southeast. Views out from the castle and surrounding parkland at ground level are considerably screened by surrounding woodland; providing a secluded and private setting. Longer and wider landscape views can be gained from upper floors of the castle; notably from the watch tower on the northwest facing elevation. The principal rooms of the castle are located in the southeast and southwest facing wings of the castle and the main focus of views and vistas from these rooms are to the southeast and southwest over parkland. The Castle, which is Category A Listed, has a current setting on the south bank of the River Spey that makes a high contribution to its understanding and appreciation, and gives it a setting of **high** sensitivity.

9.7.38 The proposed wind farm development would lie to the northwest of the castle; the closest proposed turbine being approximately 6.3 km away. The blade tip height ZTV and a photo-wireline, from the grounds to the southeast of the castle (Figure 9.7i), indicate that two of the proposed turbines would be theoretically visible in views from the environs of the castle, together with a blade tip of one existing Paul's Hill Wind Farm. That visibility would however, be at least partly screened by one or more of the many trees that lie in the parkland surrounding the castle. The proposed wind farm development would not lie in line of sight in views from the principal rooms of the castle to the southeast or southwest; and intervening woodland and trees within the designed landscape would entirely screen the proposed turbines in views to the northwest from the lower floors of the castle.

9.7.39 A wireline of the predicted view from the watch tower (Figure 9.8), on the northwest elevation of the castle, indicates that two of the proposed turbines would be theoretically visible from the uppermost window of the watch tower. The turbines would be seen (one at hub height, one as blade tip only) beyond the skyline and mostly screened by intervening topography, while intervening woodland and trees within the parkland around the castle provide additional screening at close quarters. Commercial forestry further afield, to the north of the castle, on Hill of Dalnapot and Scoot More), provide further screening.

9.7.40 Wider landscape views of the castle from the surrounding landscape are limited; the castle being screened from view from the A95 public road, which passes on the south and east side of the Ballandalloch Castle grounds, the B9102, which passes on the west, the B9137, which passes on the southwest, and the B9138, which passes to the north, by surrounding woodland policies and other intervening shelterbelts. In addition, views of the castle from along the current approach road to the castle, from the east, are principally screened by intervening woodland.

9.7.41 The introduction of the proposed Paul's Hill II development, at over 6 km distant from the castle, would not discernibly alter the character of the landscape in which the castle stands, and out over which views from the castle extend. The proposed wind farm development would be largely screened from view from within the grounds of the castle by the woodland and trees that surround it, as shown in the wireline (Figure 9.8). The presence of the proposed wind farm development, with two turbines being theoretically visible from hub height, would have a slight, but detectable effect on the setting of the castle in the absence of the screening effects provided by existing woodland and forestry.

9.7.42 Taking this into account it is assessed that the current setting of the castle (and the visitor experience) would not be material altered by the proposed wind farm development and the presence of the proposed turbines would not diminish the ability of any visitor to understand the castle in its landscape context or appreciate its setting and relationship with its surroundings. It is therefore assessed that the proposed wind farm development would have a predicted impact of no more than **low** magnitude on the setting of Ballindalloch Castle, resulting in an effect of **minor** significant (not significant in EIA terms).

Category A Listed Ballindalloch Castle Dovecot (LB8450) (Figure 9.9)

9.7.43 This well preserved Category A Listed 17th century dovecot stands just north of Ballindalloch Castle (**LB8449**) and forms part of the designed landscape that surround the castle. The dovecot is a prominent feature within the grounds of the castle and is visible from the surrounding parkland. Today the dovecot stands at the northern end of a small car park, which is used by visitors to the castle, and opposite a children's play area.

9.7.44 The main aspect of the setting of the dovecot is its historical association with Ballindalloch Castle (**LB8449**). Distant views from the dovecot do not constitute a key aspect of the dovecot's setting; the dovecot being a purely domestic structure intended to house pigeons or doves. The dovecot has a current, very localised setting that makes a high (and localised) contribution to its understanding and appreciation and it is considered that the setting is of **high**, but localised, sensitivity.

9.7.45 The proposed Paul's Hill II development would be present to the northwest of the dovecot, the nearest proposed turbine being approximately 6 km distant. The blade tip height ZTV and a wireline (Figure 9.9) indicate that the two proposed turbines (one at hub height) would be theoretically visible beyond the skyline and largely screened by intervening topography. Woodland and trees within the designed landscape would provide additional screening.

9.7.46 At 6 km distance the proposed turbines would not be visually dominant features in the wider surrounding landscape and would not materially change the immediate parkland setting of the dovecot. Their presence would not diminish the ability of any visitors to appreciate the dovecot as a feature of the designed landscape for Ballindaloch Castle or hamper the ability to understand the association between the dovecot and the castle. It is therefore assessed that the proposed wind farm development would have an impact of no more than **negligible** magnitude on the setting of the dovecot, resulting in an effect of **negligible** significance (not significant in EIA terms).

Category B Listed Tormore Distillery (LB337) (LVIA Figure 6.13a)

9.7.47 This Category B Listed distillery complex, including, the Distillery Manager's house, duty free warehouses, distillery and offices, distillery visitors house, community hall and range of dwelling houses, stands just south of the A95 public road and south of the River Spey. The distillery buildings are all grouped together in a wide semi-circle facing west and fronting onto the A95 public road.

9.7.48 The distillery was constructed between 1958 and 1960 and was the first new distillery to be built in the country in the 20th century. It was designed by Alexander Cullen with input from Sir Albert Richardson for Long John International. The distillery building is constructed from granite with copper rotors, and stands along with a village of workers house built in the same style.

9.7.49 Views from the distillery complex extend over the surrounding landscape, with wide views afforded to the north overlooking the River Spey valley and to the hills beyond. Views to the east, south and west are screened by rising topography and commercial forestry that surrounds the distillery. The existing Paul's Hill Wind Farm is visible in views to the north on the opposite side of the River Spey valley; the existing turbines visible along the skyline. The distillery complex is a prominent feature in the landscape and is prominently visible from the A95 public road, which passes to the north.

9.7.50 The setting of the asset is characterised by the roadside setting on the south side of the River Spey valley and the surrounding farmland/commercial forestry out over which views extend. The distillery has a current setting that makes a high contribution to its understanding and appreciation and it is considered that the setting is of **high**, but localised, sensitivity.

9.7.51 The proposed Paul's Hill II development would be present to the north of the distillery, the nearest turbine being 5.9 km away. A photomontage (Chapter 6: Landscape and Visual Impact Assessment, Figure 6.13a) of the view from the distillery's frontage shows that there would be visibility of two hubs and five tips; these visible beyond the skyline alongside and in conjunction with the existing Paul's Hill Wind Farm; both wind farms being seen as one slightly larger contiguous group along the hilltops on the opposite side of the River Spey valley. The proposed wind farm development would not affect views of the distillery that are afforded from the A95 public road.

9.7.52 The character of the landscape within which the distillery stands, and out over which views from its location extend, would not be discernibly altered by the introduction of the proposed Paul's Hill II development and the presence of the proposed wind farm development would not affect an ability to appreciate or understand the current setting of the distillery or its associated buildings and its landscape context. It is therefore assessed that the introduction of the proposed Paul's Hill II development would have an impact of no more than **low** magnitude on the setting of the distillery, resulting in an effect of **minor** significance (not significant in EIA terms).

Cumulative Impacts

9.7.53 Figure 9.2 shows the proposed Paul's Hill II development, along with the locations of other operational/under construction and consented wind farms, together with those cultural heritage assets within 10 km (within the proposed Paul's Hill II development blade tip height ZTV and considered in the assessment). This shows that most of the cumulative windfarm schemes that are within approximately 10 km of the proposed wind farm development lie to the north and west in an area where, due to topographic screening there is no predicted visibility of the proposed Paul's Hill II development from any heritage assets.

9.7.54 The cumulative schemes shown lie at greater distances from the heritage assets that have predicted visibility of the proposed Pauls Hill II development than the proposed wind farm development does. They also have settings that would not be adversely affected by the proposed Pauls Hill II development in addition to or in combination with any of the cumulative schemes.

9.7.55 The group of listed buildings and scheduled monuments that lie to the southeast of the proposed wind farm development (Figure 9.2) have the River Spey valley as their setting. The visualisations provided from assets in that area (Figures 9.3-9.5, 9.7-9.9 and Figure 6.13) show that, apart from the operational Paul's Hill Wind Farm, no other cumulative scheme would have any appreciable visual impact on any of the heritage assets in that area. There would therefore be no significant cumulative impact on any of these heritage assets.

9.7.56 The group of listed buildings and the scheduled monument that lie to the east of the proposed wind farm development (Figure 9.2) have settings on the north side of the River Spey valley. The visualisation provided from Knockando Churchyard (Figure 9.6) shows that, apart from the proposed Pauls Hill II development, no other cumulative schemes would have any visual impact on the church and scheduled carved stones. No other cumulative scheme would have any appreciable visual impact on any of the heritage assets in this area and there would be no significant cumulative impact on any of these heritage assets.

Decommissioning Impacts

9.7.57 No significant effects are predicted during the decommissioning of the proposed Paul's Hill II development presuming that the same road infrastructure is used for the dismantling and removal of the components of the proposed wind farm development.

9.8 EMBEDDED MITIGATION

9.8.1 Expect where otherwise stated all embedded mitigation works would take place prior to or during the construction of the proposed wind farm development. All works would be conducted by a professional archaeological organisation, and the scope of works would be detailed in a Written Scheme of Investigation (WSI). The WSI would make provision for appropriate post-excavation analyses and dissemination of the results of the embedded mitigation works, as well as for archiving of the project materials and records. The WSI would be subject to the approval of ACAS, archaeological advisors to Moray Council.

Archaeological Field Survey

9.8.2 An archaeological field survey of the proposed wind farm development infrastructure would be carried out prior to development works commencing on site. The purpose of the survey would be to locate and define any previously unidentified assets in order that they could be avoided through micrositing and ensure that, as far as is reasonably practicable and taking into account the range of issues that affect final turbine locations, the preservation in situ of any identified heritage assets.

Preservation in Situ

9.8.3 Where features lie in close proximity to proposed wind farm development features and there is a requirement to preserve in situ, they would be either entirely fenced off or visibly marked-out, as appropriate, to prevent accidental damage occurring to the remains during construction activities in the vicinity.

Watching Briefs and Excavations

9.8.4 Any requirements for archaeological mitigation through construction phase monitoring of works through watching briefs would be agreed in consultation with ACAS, archaeological advisors to Moray Council.

9.8.5 If significant discoveries are made during any required archaeological monitoring, and preservation in situ of any sites or features is not possible, provision would be made for the excavation, where necessary, of any archaeological remains encountered. This provision would include the consequent production of written reports on the findings, with post-excavation analyses and publications of the results of the works, where appropriate.

9.8.6 Written Guidelines would be issued for use by all construction contractors, outlining the need to avoid causing unnecessary damage to known sites. That document will contain arrangements for calling upon retained professional support in the event that buried archaeological remains of potential archaeological interest (such as building remains, human remains, artefacts etc.) should be discovered. The guidance will make clear the legal responsibilities placed upon those who disturb artefacts or human remains.

9.9 RESIDUAL IMPACTS

9.9.1 There would be no direct impacts on any known cultural heritage assets arising from the construction of the proposed wind farm development, including highways works or cabling work for the grid connection.

9.9.2 Completion of the embedded mitigation set out above would be sufficient to mitigate any potential direct effects and, as a result, the proposed wind farm development would not result in any significant residual direct effects on cultural heritage.

9.9.3 There are no predicted significant adverse effects on the settings of any key cultural heritage assets within the wider landscape from the proposed wind farm development; therefore the proposed wind farm development would have no significant residual effect on the setting of any heritage assets.

9.9.4 There are no predicted significant adverse cumulative effects on the settings of any key cultural heritage assets within the wider landscape; therefore the proposed wind farm development would have no significant residual cumulative effect on the setting of any heritage assets.

9.10 CONCLUSIONS

9.10.1 This assessment has considered the potential effects of the proposed Paul's Hill II development on cultural heritage interests. A desk-based assessment has been carried out for this site that has been informed by comments and information supplied by Historic Environment Scotland (HES), Moray Council's cultural heritage advisors ACAS and the Highland Council Historic Environment Team (HCHET).

9.10.2 Three heritage assets have been identified within the Inner Study Area for the proposed Paul's Hill II wind farm and a further 25 have been identified along the proposed access and grid connection routes; these mostly being of post-medieval date. One of the heritage assets (**Asset 28**), at the southeastern end of the grid connection route, is of probable prehistoric date and of regional heritage importance and medium sensitivity. The grid connection route will be designed to skirt around the woodland edge and to follow the line of an existing track, passing through an area where no remains are known to survive as visible features. It is intended that the proposed grid connection will follow the route of the existing gird connection route as far as is practical. The listed buildings at Blackboat Railway Station (**Asset 15**) and Boat Pool Bridge (**Asset 16**) are also of regional heritage

importance and medium sensitivity and would be avoided by the proposed grid connection. Other heritage assets identified are of no greater than local heritage importance and low sensitivity.

9.10.3 Historically the land for the proposed Paul's Hill II wind farm has largely remained as unimproved moorland and upland pasture used for grazing and sporting purposes. Given the low levels of peat accumulation across the Inner Study Area and the high altitude at which the proposed wind farm development would be located, it is assessed that there is a low probability of encountering previously unrecorded archaeological remains.

9.10.4 The proposed wind farm development has been designed to avoid as far as possible direct effects on heritage assets and all known assets have been avoided. Further embedded mitigation for potential direct effects on hitherto unidentified assets has been proposed, including an archaeological survey of the proposed wind farm development infrastructure prior to development and avoidance, where possible, of any heritage features identified through micrositing of development infrastructure to ensure their preservation in situ where appropriate.

9.10.5 The up-to-date data for heritage assets with statutory and non-statutory designations up to 10 km from the proposed wind farm development has been compared against the blade tip height ZTV for the proposed Paul's Hill II development and no heritage assets have been identified where potentially adverse impacts on their settings would arise.

9.10.6 The potential effect of the proposed wind farm development, both singly and cumulatively in combination with other wind farm developments in the locality, has been considered. No significant residual cumulative effect on the setting of any heritage assets would arise.

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Chapter 10

Hydrology, Geology and Hydrogeological Assessment

Contents

Glossary

Term	Definition
Aquifer	A geological formation, group of formations or part of a formation that can store and transmit water in significant quantities.
Acrotelm	The acrotelm is one of two distinct layers in undisturbed peat bogs. It overlies the catotelm.
Baseflow	The component of the river flow that is derived from groundwater sources rather than surface run-off. The Base Flow Index (BFI) value provided by the Flood Estimation Handbook (FEH) is a measure of the proportion of a catchments long-term runoff that derives from stored sources.
Buffer area	An area which protects the watercourses from pollutants and sediment from the adjacent land.
Catotelm	The lower, water-saturated zone of a mire/peat bog.
Groundwater	Water located beneath the ground surface in soil pore spaces and in the fractures of rock formations.
Headwaters	A tributary stream of a river close to or forming part of its source. Normally wet flushes, bogs or springs at the head of first-order streams.
Hydrological regime	The statistical pattern of a river's constantly varying flow rate.
Hydromorphology	Term used in river basin management to describe the hydrological and geomorphological processes and attributes of rivers, lakes, estuaries and coastal waters.
Inhomogeneous	Not uniform in character
Overland flow	Water passing rapidly over or through the surface layer of soil.
Peak flow	The maximum flow recorded during a high flow event.
Peat	A largely organic substrate formed of partially decomposed plant material
Precipitation	Deposition of moisture including dew, hail, rain, sleet and snow.
Present Paul's Hill Wind Farm	The 'original Paul's Hill Wind Farm' refers to the existing Wind Farm.
Private water supply	Any water supply which is not provided by a water company and is not connected to mains supply. Most private water supplies are situated in more remote, rural parts of the country and may just serve one property or several properties through a network of pipes.
Return period	Is a measure of the rarity of an event: the longer the return period, the rarer the event.
Riparian zone	Land immediately adjoining the aquatic zone of a watercourse and influenced by it.
Runoff	Surface runoff is the flow of water over the surface that can result due to the surrounding soils lacking the capacity to infiltrate further water or due to the surface water flowing off infrastructure such as access tracks and hardstandings.
Sedimentation	The tendency for particles in suspension to settle out of the fluid in which they are entrained.
Standard percentage runoff	The percentage of rainfall that is likely to contribute to runoff. For example, an SPR value of 50 % would suggest that half of the rainfall during an event will contribute to runoff.
Surface water catchment	The area from which runoff would naturally discharge to defined point of a river.
Thixotropic	Having a viscosity that decreases when a stress is applied
Topography	The physical features of a geographical area.
Water resources	The supply of groundwater and surface water in a given area.
General Terms	
Environmental Impact Assessment	Environmental Impact Assessment (EIA) is a means of drawing together, in a systematic way, an assessment of the likely significant environmental affects arising from a proposed development
Environmental Statement	A document reporting the findings of the EIA and produced in accordance with the EIA Regulations
The Existing Paul's Hill Wind Farm	The 'existing Paul's Hill Wind Farm' refers to the operational Paul's Hill Wind Farm.
The Proposed Development	The proposed Paul's Hill II Wind Farm
The Proposed Development Area	Red line boundary (application area)

List of Abbreviations

Abbreviation	Description
AOD	Above Ordnance Datum
BFI	Base Flow Index
BGS	British Geological Society
CAR	Controlled Activities (Scotland) Regulations
CEMP	Construction Environmental Management Plan
CIRIA	Construction Industry Research and Information Association
DTM	Digital Terrain Model
ECoW	Ecological Clerk of Works
ES	Environmental Statement
FEH	Flood Estimation Handbook
GIS	Geographical Information System
GWDTEs	Groundwater Dependent Terrestrial Ecosystems
IoH	Institute of Hydrology
MC	Moray Council
PAN	Planning Advice Notes
PMP	Peat Management Plan
PWS	Private Water Supplies
RBMP	River Basin Management Plan
SAAR	Standard Average Annual Rainfall
SEPA	Scottish Environment Protection Agency
SFB	Spey Fishery Board
SNH	Scottish Natural Heritage
SPP	Scottish Planning Policy
SPR	Standard Percentage Runoff
SSSI	Site of Special Scientific Interest
SuDS	Sustainable Drainage Systems
TWI	Topographic Wetness Index

10.1 INTRODUCTION

10.1.1 This Chapter of the Environmental Statement (ES) assesses the impacts on the hydrological, geological and hydrogeological environment of **Paul's Hill II Wind Farm** and the potential impacts resulting from the construction, operation and ultimate decommissioning of the proposed turbines and associated infrastructure. This assessment and associated Technical Appendices were undertaken by Natural Power Consultants (Natural Power) Hydrology and Geotechnical Teams.

10.1.2 This Chapter details the existing baseline conditions in terms of the hydrological, geological and hydrogeological conditions present within the Paul's Hill II Development Area (see Figure 10.1 in Volume 3 of the ES). The assessment covers the construction, operation and decommissioning phases of the proposed Paul's Hill II Wind Farm development and identifies elements which have the potential to influence the existing baseline environment.

10.1.3 Effects on hydrology, geology and hydrogeology may also result in secondary effects on habitats (peat and groundwater dependant ecosystems (GWDTE)) or species. Effects on ecological (non-avian) receptors are considered in Chapter 7: Ecology of this ES, with further effects on peat and geotechnical considerations provided in Technical Appendix 10.2: Peat Stability Risk Assessment in Volume 4 of the ES.

10.1.4 The assessment is also supported by the following Technical Appendices:

- Technical Appendix 10.1: Geotechnical Desk Study;
- Technical Appendix 10.2: Peat Stability Risk Assessment;
- Technical Appendix 10.3: Peat Management Plan;
- Technical Appendix 10.4: Borrow Pit Search Report;
- Technical Appendix 10.5: Carbon Balance Assessment;
- Technical Appendix 10.6: Watercourse Crossing Assessment;
- Technical Appendix 10.7: Private Water Supply Risk Assessment; and
- Technical Appendix 10.8: Groundwater Dependent Terrestrial Ecosystem Assessment.

10.1.5 Accompanying figures to this assessment are contained in Volume 3: ES Figures.

10.1.6 Hydrological, geological and hydrogeological considerations have influenced the design of the proposed Paul's Hill II Wind Farm Development and these are considered in Chapter 3: Site Selection and Evolution, of the ES.

10.1.7 Note, the title of this chapter is the Hydrological, Geological and Hydrogeological Assessment however there is no consideration to the geological environment within the chapter. Geology has been scoped out of the assessment, as detailed in the Scoping Report (Appendix 1.1 in Volume 4 of the ES)

10.2 SCOPE OF ASSESSMENT

Project Interactions

10.2.1 The proposed wind farm development will introduce physical changes which have the potential to alter the hydrological characteristics within the Paul's Hill II Development Area. During the construction phase and to a lesser extent during the operational phase potential sources of pollution will be present. Hydrological surveys have been undertaken to establish the existing on-site baseline conditions and associated areas downstream to assess the potential effect of the proposed Paul's Hill II Wind Farm Development on the identified receptors, the significance of these effects on the receptors and the potential for embedded mitigation to reduce the significance of the identified effects.

Site Area

10.2.2 The proposed Paul's Hill II development would be located adjacent to the existing Paul's Hill Wind Farm which became operational in May 2006. Existing infrastructure and tracks associated with the existing development will be utilised wherever it is practical to do so. The proposed Paul's Hill II Wind Farm development area would be located in an upland area comprising of largely blanket bog habitat.

10.2.3 A topographic high is reached in the east at Roy's Hill of 516 m Above Ordnance Datum (AOD) with the majority of areas of the infrastructure for the proposed Paul's Hill II Wind Farm Development on the northern side of Roy's Hill, noted to be above 300 m AOD.

10.2.4 The hydrological study area is larger in extent than the actual site and includes the lower reaches of watercourse catchments to the north and to the south. The extents of the catchments relating to the main turbine area are shown in Figure 10.1 in Volume 3 of the ES which outlines the extent of the study area. Designated sites and other relevant developments are considered from the perspective of assessing any potential hydrological linkages or cumulative effects.

Scoping and Consultation

10.2.5 The scoping and consultation responses relating to the water environment are summarised in Table 10.1 below.

Table 10.1: Consultation Responses

Organisation	Comment	Responses
Scottish Environment Protection Agency (SEPA)	Schedule of mitigation including pollution prevention measures.	Addressed between paragraphs 10.6.5 and 10.6.56 of this Chapter. Will also be included in a CEMP
	Decommissioning statement.	Addressed between paragraph 10.2.7. Additional statement also in Chapter 4
	Map and assessment of all engineering works within and near the water environment including buffers and details of any related CAR applications. Provided watercourse crossings are appropriately designed SEPA do not foresee a need for detailed information on flood risk.	Addressed between paragraphs 10.6.9 and 10.6.10 of this chapter. Additional maps and figures reproduced in Technical Appendix 10.6: Watercourse Crossing Assessment
	Map and assessment of impacts upon Groundwater Dependent Terrestrial Ecosystems and buffers Demonstrating GWDTE have been avoided. If the minimum buffers specified by SEPA cannot be achieved, a detailed site specific qualitative and/or quantitative risk assessment will be required.	Addressed between paragraphs 10.5.43 and 10.5.45 of this chapter. More substantial detail provided in Technical Appendix 10.8 Groundwater Dependent Terrestrial Ecosystem Assessment and within Chapter 7 - Ecology Assessment.
	Peat depth survey, table detailing re-use proposals and a comprehensive site specific Peat Management Plan.	Addressed between paragraphs 10.5.31 and 10.5.37 and Technical Appendix 10.2: Peat Slide Risk Assessment. The Peat Management Plan can be found in Technical Appendix10.3.
	Map and site layout of borrow pits and a Borrow Pit Site Management Plan of pollution prevention measures.	Refer to Technical Appendix 10.4: Borrow Pit Search Report
	Map and assessment of impacts upon groundwater abstractions and buffers if appropriate. Based on the information provided at this stage it seems unlikely that any development will take place within 250 m of a groundwater supply source; if this is the case it would be helpful if the ES provides evidence to confirm this.	Refer to paragraph 10.5.28 and Technical Appendix 10.7: Private Water Supply Risk Assessment.
The Scottish Government / Scottish Water	Scottish Water has abstractions from two sources; the Spey Boreholes and Ordiequish Collecting Chamber which are both surface water influenced. These sources are located near Fochabers, approximately 30km downstream of the site on the River Spey. Accordingly, as part of the EIA, an assessment should be undertaken to ensure that proposed activities do not impact on these sources.	Refer to paragraph 10.5.27 and Tables 10.16 and 10.17
Scottish Natural Heritage	The project lies within the catchment of the River Spey and has clear connectivity with the River Spey SAC. Request that some elements, for example the provision of a CEMP and peat management plan, are secured by planning condition.	Refer to Technical Appendices 10.3: Peat Management Plan and a Construction Environment Management Plan will be prepared post consent

Effects to be assessed

10.2.6 The greatest risk of the proposed Paul's Hill II Wind Farm Development affecting the hydrological, geological and hydrogeological environment will occur during the construction phase, with effects reduced during the operational and decommissioning phases. Taking this into account the following issues will be addressed during all phases of development of the proposed wind farm development:

- Changes to existing drainage patterns;
- Effects on base flow;
- Effects of cumulative flooding;
- Effects on erosion and sedimentation;
- Effects on groundwater and surface water quality;
- Effects on groundwater levels;
- Effects on water resources;

- Effects on impediments to flow;
- Pollution risk; and
- Effects on hydrological integrity of peat bodies.

Issues Scoped out of Assessment

10.2.7 Effects arising from the decommissioning of the proposed Paul's Hill II Wind Farm Development have been scoped out (see Appendix 1.1: Scoping Report and Appendix 1.2: Scoping Opinion which contains SEPA response) since they involve similar, but smaller scale processes to those employed during construction. Despite this similarity the results of decommissioning (i.e. the removal of the proposed Paul's Hill II Wind Farm Development) are taken into account in assessing ongoing and operational effects where appropriate.

10.2.8 Additional factors considered at the scoping stage have also been excluded from this ES on account of the preliminary assessment identifying the absence of any risks to receptors associated with the proposed Paul's Hill II Wind Farm Development. These scoped out elements of the EIA, along with a justification for exclusion are presented below in Table 10.2.

Table 10.2: Scoped out baseline factors

Baseline*	Scoping Decision	Reason
Flood Risk	Scoped Out – with the exception of cumulative flood risk	Desk based assessment and site visit show that the site is not at risk from flooding. Embedded drainage mitigation means that the site will not increase downstream flood risk or be at risk of flooding.
Geology	Scoped Out	Construction will have no significant impact on solid geology due to the uniformity underlying the site. No specific geological features have been identified.
Fisheries and Recreation	Scoped Out	This will be covered in the Ecology Section and water quality will be assessed and protected which in turn will protect fisheries and recreation interests.

**Each baseline factor was considered in detail prior to scoping decision. Further information is presented in the Paul's II Wind Farm Scoping Report produced by Natural Power in 2017 (Appendix 1.1)*

10.2.9 These baseline elements presented in Table 10.2 will be discussed within Section 10.5, however as they have been previously assed in the Scoping Report[1] they will not be reassessed in Section 10.6 of this report.

10.3 POLICY CONTEXT

10.3.1 The assessment takes into account the requirements of the Water Framework Directive (2000/60/EC) (WFD). The WFD aims to protect and enhance the quality of surface freshwater (including lakes, rivers and streams), groundwater, groundwater dependent ecosystems, estuaries and coastal waters. The key objectives of the WFD relevant to this assessment are:

- To prevent deterioration and enhance aquatic ecosystems; and
- To establish a framework of protection of surface freshwater and groundwater.

10.3.2 The WFD resulted in The Water Environment and Water Services (Scotland) Act 2003, which gave Scottish Ministers powers to introduce regulatory controls over water activities in order to protect, improve and promote sustainable use of Scotland's water environment. These regulatory controls, in the form of The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended) or CAR, made it an offence to undertake the following activities without a CAR authorisation:

- Discharges to all wetlands, surface waters and groundwaters;
- Disposal to land;
- Abstractions from all wetlands, surface waters and groundwaters;
- Impoundments (dams and weirs) of rivers, lochs, wetlands and transitional waters; and
- Engineering works in inland waters and wetlands.

10.3.3 Under the Water Environment (Miscellaneous) (Scotland) Regulations 2017 the proposed wind farm development might require a construction site licence under CAR for water management across the entirety of the wind farm site prior to any construction works taking place, including enabling works. It is also likely that no work will be able to commence on site until a Pollution Prevention Plan (PPP) has been prepared and agreed with SEPA.

National Legislation and Policy

10.3.4 The assessment also takes into account the following legislation and policy:

- The Water Environment and Water Services (Scotland) Act 2003;
- The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended);
- The Water Environment (Miscellaneous) (Scotland) Regulations 2017;
- Flood Risk Management (Scotland) Act 2009;
- The Water Supply (Water Quality) (Scotland) Regulations 2001;
- Private Water Supplies (Scotland) Regulations 2006;
- Part IIa of the Environment Protection Act 1990;
- Waste Management Licensing Regulations 1994;
- Pollution Prevention and Control Regulations (Scotland 2000);
- Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000 and Amendment Regulations 2008;
- Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017;
- Scottish Planning Policy (2014); and
- SEPA Policies:
  - No. 19 Groundwater Protection Policy for Scotland;
  - No. 41 Development at Risk of Flooding: Advice and Consultation;
  - No. 54 Land Protection Policy; and
  - No. 61 Control of Priority & Dangerous Substances & Specific Pollutants in the Water Environment.

Regional Policy

10.3.5 The following regional policies are also taken into account during the assessment:

- Moray Council Local Development Plan 2015; and
- Cairngorms National Park Local Development Plan 2015.

Other Guidance and Best Practice

10.3.6 Table 10.3 below lists other key guidance and best practice documentation which has been considered as part of this assessment.

Table 10.3: Guidance and Best Practice

TOPIC	SOURCE OF INFORMATION
Scottish Government Planning Advice Notes (PAN's)	• PAN 50: Controlling the Environmental Effects of Surface Mineral Workings; • PAN 51 Planning (revised 2006), Environmental Protection and Regulation; • PAN 1/2013 Environmental Impact Assessment; • PAN 61 Planning and Sustainable Urban Drainage Systems; and • PAN 79 Water and Drainage.
SEPA Pollution Prevention Guidelines (PPG's and replacement Guidance for Pollution Prevention (GPPs) SEPA are currently replacing the PPGs with updated versions, known as GPPs.	• PPG1: General Guide to the Prevention of Water Pollution; • GPP2: Above Ground Oil Storage Tanks; • GPP4: Treatment and Disposal of Wastewater where there is No Connection to the Public Foul Sewer; • GPP5: Works and Maintenance in or Near water; • PPG6: Working at Construction and Demolition Sites; • PPG 21 – Dealing with spills; • GPP8: Safe Storage and Disposal of Used Oil; and • GPP21 Polluting Incident Response Planning • PPG22 Incident Response – Dealing with Spills
SEPA Position Statements (Published)	• WAT-PS-06-02: SEPA (2015), Culverting of Watercourses, Version 2; • WAT-PS-07-02: SEPA (2012), Bank Protection, Version 2; and • WAT-SG- 78: SEPA (2012), Sediment Management Authorisation, Version 1.
Construction Industry Research and Information Association (CIRIA)	• CIRIA C692 Environmental Good Practice on Site (third edition); • CIRIA C753 The SuDS Manual; • CIRIA C532 Control of Water Pollution from Construction Sites; • CIRIA C648 Control of Water Pollution from Linear Construction Projects; and • CIRIA C689 Culvert Design and Operation Guide.
Other Guidelines	• Scottish Renewables Joint Publication, (2015) Good Practice During Wind Farm Construction Version 3 • FCE, SNH, (2010), Floating Roads on Peat; • Scottish Renewables, Joint Publication (2012), Development of Peatland: Guidance on the Assessment of Peat Volumes, Reuse of Excavated Peat and the Minimisation of Waste; • SEPA, The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended), A Practical Guide, Version 8, January 2018; • River Crossings and Migratory Fish: Design Guidance, A Consultation Paper, The Scottish Executive; • WAT-SG-23: SEPA (2008), Engineering in the Water Environment, Good Practice Guide - Bank Protection Rivers and Lochs, Version 1; • WAT-SG-25: SEPA (2010), Engineering in the Water Environment, Good Practice Guide, C River Crossings, Version 2; • WAT-SG-26: SEPA (2010), Engineering in the Water Environment, Good Practice Guide, Sediment Management, Version 1; • WAT-SG-31: SEPA, (2006) Special Requirements for Civil Engineering Contracts for the Prevention of Pollution, Version 2; • SEPA Land Use Planning Guidance Note 4 (2014): Planning Guidance on On-Shore Windfarm Developments, Version 7; and • SEPA Land Use Planning Guidance Note 31 (2014): Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems, Version 2.

10.4 METHODOLOGY

Overview

10.4.1 The assessment has involved the following:

- Consultation with relevant statutory and non-statutory bodies as part of the scoping exercise;
- Detailed desk studies and site visits to establish conditions of the area;
- Evaluation of the potential effects of the proposed Paul's Hill II Wind Farm Development and the effect that these could have on the current site conditions;
- Identification of embedded good practice measures to avoid and mitigate against any identified adverse effects resulting from the proposed Paul's Hill II Wind Farm Development;

- Evaluation of the significance of these effects by consideration of the potential embedded mitigation measures, taking into account the sensitivity of the baseline features of the site, the potential magnitude of these effects and the probability of these effects occurring; and
- The residual significance of the potential effects following the consideration of additional mitigation measures.

Baseline Assessment

10.4.2 A desktop survey to establish the baseline was undertaken in order to;

- Describe surface water hydrology, including watercourses, springs and waterbodies;
- Identify existing catchment pressures (e.g. point source and diffuse pollution issues);
- Identify all private drinking water abstractions and public water supplies within 3 km of the site;
- Describe the hydromorphological conditions of watercourses;
- Collate hydrological flow data for the immediate area and main downstream watercourses;
- Collect soil and hydrogeological information;
- Confirm surface water catchment areas and watersheds; and
- Confirm the extent and nature of peat deposits across the site (Technical Appendix 10.2: Peat Stability Risk Assessment in Volume 4 of the ES).

10.4.3 Published information consulted for the baseline is outlined in Table 10.4 below.

Table 10.4: Baseline Information Sources

Topic	Sources of Information
Topography	5 m contour data derived from Digital Terrain Model (DTM) data
Designated Nature and Conservation Sites	In-house Designated Site database SNHi Sitelink website (http://www.snh.org.uk/snhi/)
Solid and Superficial Geology	BGS Digital Data provided at www.emapsite.com Borehole Records, The British Geological Society,
Soils and Peat	James Hutton Institute, Soil Survey of Scotland, Aberdeen – Sheet 5, Eastern Scotland (1981) Scottish Natural Heritage – Carbon Soils Map (2016).
Climate	MET Office Climate Summaries Flood Estimation Handbook (FEH) CD-ROM
Surface Water Hydrology	1:10,000 OS Raster Data 1:50,000 OS Raster Data Flood Estimation Handbook (FEH) (https://fehweb.ceh.ac.uk/)
Flooding	Indicative River and Coastal Flood Map (SEPA) http://map.sepa.org.uk/floodmap/map.htm
Water Quality	SEPA, River Basin Management Plans, Web Mapping Application, http://gis.sepa.org.uk/rbmp/ SEPA, The river basin management plan for the Scotland river basin district 2009 – 2015
Water Resources	Private water supply information provided by Moray Council
Hydrogeology	Scotland's Environment Web Interactive Map, http://www.environment.scotland.gov.uk/get-interactive/map-view/ SEPA, River Basin Management Plans, Web Mapping Application, http://gis.sepa.org.uk/rbmp/

Field Survey Techniques

10.4.4 A field survey was undertaken between the 7th April and the 9th April 2015 to carry out the preliminary 100 m grid peat depth assessment in line with current guidance. The weather during the peat depth assessment was overcast with intermittent sunny spells. A further field survey was undertaken on the 5th of October 2017 to help determine the hydrological characteristics of the proposed Paul's Hill II Wind Farm Development. The purpose of the field survey was to gain an understanding of the hydrology, topography, soils and geography of the site. A survey of the proposed watercourse crossings required for the site access tracks within the turbine area was also undertaken during the hydrological survey. The weather conditions during the field survey were cold with occasional sunshine and heavy rainfall showers.

Effects Evaluation

10.4.5 The significance of the potential impacts of the proposed Paul's Hill II Wind Farm Development have been defined by taking into account two main factors; the sensitivity of the receiving environment and the potential magnitude should that effect occur. The approach is based on guidance outlined in Scottish Natural Heritage (SNH) Guidance - A Handbook on Environmental Impact Assessment[1]. The SNH Guidance has been adopted by Natural Power based on experience of carrying out impact assessments for a range of proposed onshore wind developments.

10.4.6 The sensitivity of the receiving environment i.e. its baseline quality as well as its ability to absorb the effect without perceptible change is defined in Table 10.5 below.

Table 10.5: Definition of Sensitivity of the Receiving Environment

Sensitivity	DEFINITION
High	International importance. High quality and rarity, regional or national scale and limited potential for substitution/replacement. National importance. Receptor with a high quality and rarity, local scale and limited potential for substitution/replacement or receptor with a medium quality and rarity, regional or national scale and limited potential for substitution / replacement.
Medium	Regional importance. Receptor with a medium quality and rarity, local scale and limited potential for substitution/replacement or receptor with a low quality and rarity, regional or national scale and limited potential for substitution / replacement.
Low	Local importance. Receptor with a low quality and rarity, local scale. Environmental equilibrium is stable and is resilient to changes that are greater than natural fluctuations, without detriment to its present character.

10.4.7 The magnitude of impact includes the timing, scale, size and duration of the potential impact. For the purposes of this assessment the magnitude of impact criteria area defined in Table 10.6 below.

[1] Scottish Natural Heritage (2013), A Handbook on Environmental Impact Assessment, Guidance for Competent Authorities, Consultees and others involved in the Environmental Impact Assessment Process in Scotland, 4th Edition

Table 10.6: Magnitude of Impact

Magnitude	Criteria	Definition
High	Results in loss of attribute.	Fundamental (long term or permanent) changes to geology, hydrology, water quality and hydrogeology.
Medium	Results in effect on integrity of attribute or loss of part of attribute.	Material but non-fundamental and short to medium term changes to the geology, hydrology, water quality and hydrogeology.
Low	Results in minor effect on attribute.	Detectable but non-material and transitory changes to the geology, hydrology, water quality and hydrogeology.
Negligible	Results in effect on attribute but of insufficient magnitude to affect the use/integrity.	No perceptible changes to the geology, hydrology, water quality and hydrogeology.

10.4.8 Assuming the successful implementation of best practice and embedded mitigation measures the sensitivity of the receiving environment together with the magnitude of the effect defines the significance of the effect as outlined in Table 10.7 below.

Table 10.7: Significance of Effect

SIGNIFICANCE MATRIX			
MAGNITUDE OF CHANGE			
High	Moderate	Moderate/Major	Major
Medium	Minor/Moderate	Moderate	Moderate/Major
Low	Minor	Minor/Moderate	Moderate
Negligible	Negligible/Minor	Minor	Minor/Moderate
	Low	Medium	High
		SENSITIVITY OF RECEIVING ELEMENT	

10.4.9 Potential effects are therefore concluded to be Major, Moderate, Minor or Negligible. Effects considered as being Major or Moderate/Major are considered significant in terms of the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000 and Amendment Regulations 2008.

Limitations of Assessment

10.4.10 The fieldwork carried out was a standard reconnaissance level walkover survey covering the majority of all of the main hydrological features. Due to the geographical extent of the Planning Application Boundary and associated study area (outlined in Figure 10.1 in Volume 3 of the ES); it was not practical to traverse the whole site. However, various representative locations and features such as watercourses, peat bodies and geological information were assessed and this information interpreted for areas not visited.

10.4.11 Private water supply information has been provided by Moray Council (TMC). Additional private water supply sources on-site are considered unlikely due to the location of the proposed Paul's Hill II Wind Farm Development and none were observed during the site visit. However, it is possible that there are non-potable supplies, such as for livestock, which were not identified by the Local Authority.

10.4.12 The assessment of effects has been made on the basis of the current layout (see Figure 1.2 in Volume 3 of the ES), with the assumption that the detailed design will not result in the movement of infrastructure into areas of higher impact as presented within the buffers provided in Figure 10.1 in Volume 3 of the ES.

10.4.13 The information presented in this assessment is based on desk studies and site investigations. There is the potential that further constraints may be identified during the pre-construction detailed design stage. Should further constraints be identified these will be assessed and appropriately mitigated prior to construction.

10.5 BASELINE CONDITIONS

Context

10.5.1 This subsection presents the information gathered on the existing topographical, hydrological, and hydrogeological (including peat) conditions within the study area which are outlined within the Figure 10.1 in Volume 3 of the ES.

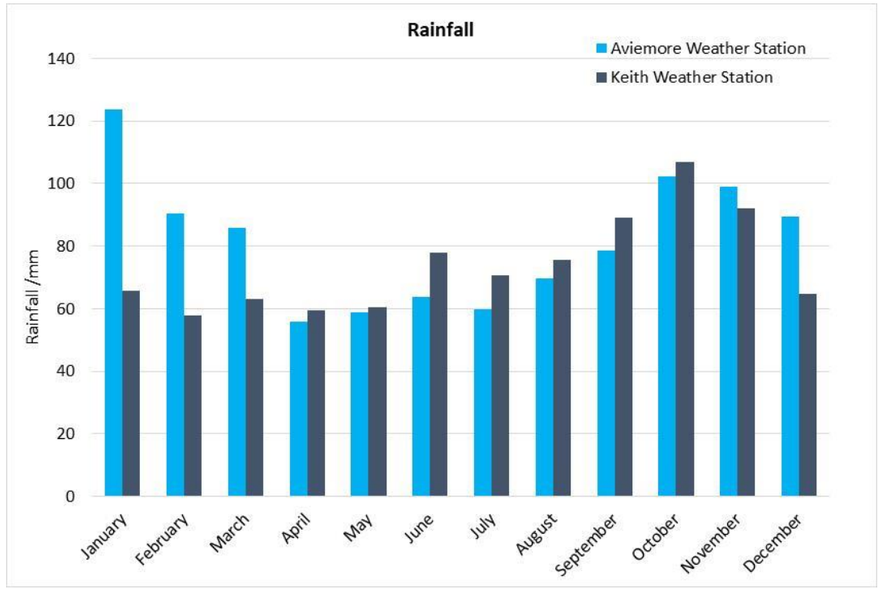
Climate

10.5.2 The standard average annual rainfall (SAAR) for the Site has been derived from the FEH Web Service[2] as ranging from 1851 – 1877 mm based on the site catchments. To put this into context, rainfall in Scotland varies from under 800 mm a year on mainland eastern Scotland in areas such as Fife to over 3000 mm on the mainland Western Highlands.

Annual average rainfall data for 1981 to 2010 was sourced from the Met Office Website for the Keith and Aviemore weather stations and is presented below in Graph 10.1. The respective seasonal averages for Keith and Aviemore were 883.6 mm and 977.2 mm per annum[3]. The average monthly rainfall totals for both locations indicate an expected seasonal trend, with higher overall volumes of rainfall observed during the winter months from October through to April, with volumes lower during the summer. The proposed wind farm development is at a greater elevation than the Aviemore and Keith Weather Stations and therefore experiences a higher average rainfall however the data provides a good indication of seasonal trends.

[2] FEH Web Service, https://fehweb.ceh.ac.uk/, accessed 28/11/2017

[3] Keith Climate: https://www.metoffice.gov.uk/public/weather/climate/gfjzkg7yh and Aviemore Climate: https://www.metoffice.gov.uk/public/weather/climate/gfjm2yj30



Graph 10.1 Rainfall Data for the Keith and Aviemore Met Office Rain Gauges

Designated Sites

10.5.3 There is one designated area within 5 km of the site that is of relevance to hydrology and has a hydrological linkage with the proposed Paul's Hill II Wind Farm Development. The River Spey and its tributaries are a Special Site of Scientific Interest (SSSI) and Special Area of Conservation (SAC) for Atlantic Salmon, Freshwater Pearl Mussels, Sea Lamprey and Otter. Some of the waters draining the proposed wind farm development are tributaries of watercourses which drain into the River Spey.

10.5.4 The Allt Arder watercourse to the north of the Paul's Hill II Development Area feeds into the River Spey. The watercourses in the northern section of the site including the Blarnish Burn and Caochan Liath drain to the north and converge before discharging into the Allt Arder. The Allt a' Gheallaidh watercourse flows through the Glen Gheallaidh valley at the base of Lady's Hill and marks the southern extent of the site boundary. The Allt a' Gheallaidh watercourse itself is topographically separated from the proposed wind farm development by the slopes of both Roy's and Lady' Hill. However, the watercourses draining the southern extent of the proposed Paul's Hill II Development Area eventually drain to the Allt a' Gheallaidh, which feeds directly into the River Spey.

10.5.5 Further details on designated sites can be found within the Pauls Hill II Scoping Report in Appendix 1.2 in Volume 4 of the ES.

Surface Water Hydrology

10.5.6 Watercourses were identified utilising the Ordnance Survey 1:10,000 scale watercourse area and watercourse line vector basemap, as well as during the site visit.

10.5.7 Hydrologically, the proposed Paul's Hill II Wind Farm Development lies straddled between two catchments, both ultimately forming part of the River Spey network. The northern area of the site drains roughly north and is within the catchments of the Blarnish Burn and Caochan Liath, these watercourses converge and feed in the Allt Arder. The watercourses draining the southern area of the site are the Allt a' Mhonaldh and Tods' Burn. Tods' Burn flows into the Allt a' Mhonaldh within the Paul's Hill II Development Area and the Allt a' Mhonaldh converges with Allt a' Gheallaidh further downstream.

10.5.8 These catchments are discussed in detail in the following paragraphs, and accompanied by the following Figures (which can be found in Volume 3 of the ES):

- ES Figure 10.1: Hydrological Characteristics;
- ES Figure 10.2: Flow Accumulation and Direction;
- ES Figure 10.3: Topographic Wetness Index; and
- ES Figure 10.4: Groundwater Flooding Potential.

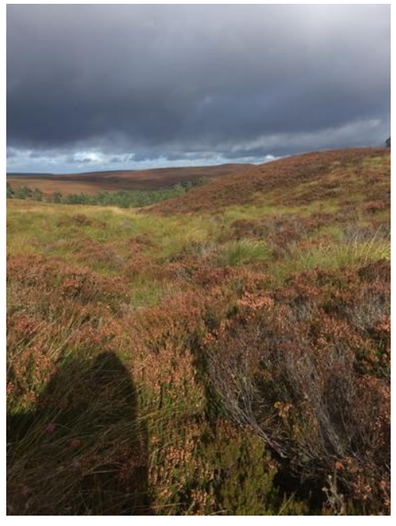
10.5.9 The hydromorphology has been qualitatively assessed in line with Annex V of the WFD for river continuity, morphological conditions and structure of the riparian zone.

Allt Arder

10.5.10 The Allt Arder originates on the slopes of Carn Shalag (NJ 11546 42534) in the north west area of the proposed Paul's Hill II Wind Farm Development. It flows in an easterly direction, being joined by the Blarnish Burn and Caochan Liath (NJ 13925 42459) before becoming the Cally Burn where it confluences with the River Spey just west of the settlement of Knockando (NJ 18173 41335).

10.5.11 The Blarnish Burn and the Caochan Liath form part of a tributary network to the Allt Arder which drain the northern part of the site. These watercourses are typical upland watercourses, situated within heavily vegetated riparian zones. The channels are also often incised into the peat, occasionally exposing the underlying mineral soil (glacial deposits or weathered bedrock).

10.5.12 Photographs 10.1a and 10.1b provide an example of the catchment conditions within the Allt Arder catchment.



Photograph 10.1a Heavily vegetated riparian zone

Photograph 10.1b Moderately sloping ground within catchment which was generally dry underfoot

Allt a' Gheallaidh

10.5.13 The Allt a'Gheallaidh is a burn which flows south east down Glen Gheallaidh draining much of the wider area bounding the proposed Paul's Hill II Wind Farm Development, the existing Paul's Hill Wind Farm as well as the hills to the west. The burn continues flowing south easterly for 5 km before joining the River Spey north of Cragganmore at NJ 17592 37688.

10.5.14 Tod's Burn is a tributary to the Allt a'Gheallaidh and is situated within the boundary of the proposed Paul's Hill II Wind Farm Development. The stream is mapped from a high point of 430 m AOD (NJ 13350 40434) and flows south westerly for 1.5 km before joining the Allt a' Mhonaidh (NJ 12667 39944) subsequently merging with the Allt a'Gheallaidh at NJ 12569 38689.

10.5.15 The hydromorphology of Tod's Burn and the adjacent catchments is similar to those within the Allt Arder network, with heavily vegetated riparian zones often incised into the peat soil. Bedload comprises of boulders, gravels, silts clays and peat and in some areas peripheral riparian zones will also be water saturated.

10.5.16 Photographs 10.2a and 10.2b provide an example of the site watercourses within the Allt a'Gheallaidh catchment.

Photograph 10.2a Incised headwater within the Tod's Burn sub catchment

Photograph 10.2b Example of ground conditions within the Allt a, Gheallaidh catchment

Hydrological Regime

Effects of Forestry

10.5.17 There is no forestry mapped to be within the proposed Paul's Hill II Development Area. Although some areas of forestry do exist to the south of the site, these are unlikely to require felling. Therefore the details of the hydrological impacts of forestry removal will not be discussed further.

Flow Estimation

10.5.18 Peak flows (up to the 200 year storm event) have been estimated for the key catchments described above using the FEH Rainfall Runoff method (FEH RR) for a range of return periods, with the results presented in Table 10.8. Catchment descriptors were derived from the FEH Web Services[4] and used for calculating peak flows for the identified catchments.

10.5.19 To ensure the estimated peak runoff data is accurate and robust, peak flows have also been presented using the guidance prescribed by the Institute of Hydrology (IoH) Flood estimation for small catchments[5][6]. This alternative technique calculates specific run-off rates for stated return periods but is specifically designed for smaller rural catchment areas, such as those investigated within this ES. Catchment boundaries have been used in their entirety, as opposed to their delineation along the boundary of the proposed development, which would otherwise generate potentially unrepresentative results.

10.5.20 Base Flow Index (BFI) and Standard Percentage Runoff (SPR) data for the site catchments was also taken from the FEH Web Service. The BFI is a measure of the proportion of a catchment's long-term runoff that derives from stored sources, with the BFI ranging from 0.1 in relatively impermeable clay catchments to 0.99 in highly permeable catchments. The SPR values represent the percentage of rainfall that is likely to contribute to runoff.

10.5.21 The BFI for the site catchments range from 0.236 to 0.264 indicating that around a quarter of the catchment's long term runoff is derived from stored sources. The SPR for the site catchments ranges from 57.12 % to 59.25 % indicating that just over half of the rainfall during a rainfall event contributes to runoff. The BFI and SPR values show that the site is located on relatively slowly permeable catchments.

Table 10.8: Estimated peak runoff rates for site catchments calculated using the methodology prescribed by the FEH RR and in IoH Report no. 124.

Burn Name	Area (km^2)	Method	Estimated Peak Runoff (m3/s) for Stated Return Periods							
			2	5	10	25	50	100	200	200+CC
Caochan Liath	1.15	FEH RR	1.09	1.56	1.92	2.38	2.81	3.26	3.80	4.56
		IH 124	0.99	1.32	1.59	1.99	2.00	2.33	2.73	3.28
Blarnish Burn	1.55	FEH RR	1.46	2.13	2.56	3.18	3.74	4.35	5.01	6.01
		IH 124	1.40	1.87	2.26	2.82	2.83	3.30	3.86	4.63
Tod's Burn	0.81	FEH RR	0.84	1.24	1.50	1.87	2.19	2.53	2.96	3.55
		IH 124	0.78	1.04	1.26	1.58	1.59	1.85	2.16	2.59
Allt a' Mhonaidh	1.99	FEH RR	1.66	2.43	2.92	3.61	4.26	4.94	5.75	6.90
		IH 124	1.73	2.31	2.79	3.49	3.51	4.09	4.78	5.74

10.5.22 Figure 10.2 in Volume 3 of the ES provides information on the flow direction of the surface runoff within the Paul's Hill II Development Area. Flow accumulation is calculated in ArcGIS and is based on the 5 m resolution Digital Terrain Model (DTM) of the area occupied by the site. The flow accumulation represents the volume of water that would flow into each 5 m cell of the DTM, assuming that all water becomes runoff and there was no interception, evapotranspiration or infiltration. The volume of accumulation is represented in greyscale with higher flow accumulations being darker in shade to areas with lower flow accumulation. This Figure clearly illustrates the influence of topography on the accumulation and direction of surface water runoff across the site.

10.5.23 Figure 10.3 in Volume 3 of the ES also provides information on how the topography influences the surface saturation of the peat and soils across the site. The analysis of the DTM derived a topographic wetness index (TWI). The TWI is a dimensionless index, defined by the equation: ln (a/tan b) where a = area draining through a point from an upslope contributing area and tan b is the local slope angle. The index provides results on the hydrological similarity of peat. All points with the same value of the index are assumed to respond in a similar hydrological manner. High index values will tend to saturate first and will therefore indicate potential subsurface or high surface runoff areas.

10.5.24 As shown in Figure 10.3 in Volume 3 of the ES, the TWI for the site has identified those areas where water will accumulate on site and result in saturation of the surrounding peat. The highest values (18 plus) in the TWI form linear channels or where areas have a tendency to become saturated are shown in blue and drier areas where there may be less tendency for the ground to saturate are shown in orange and red. The dark blue linear channels are considered to show achievable flow rates that are likely to occur throughout the year or during extreme rainfall

[4] Flood Estimation Handbook Web Service (2015), Centre for Ecology & Hydrology. Available at https://fehweb.ceh.ac.uk/ (accessed 31/10/2017).

[5] Marshall, D. & Bayliss, A. (1994), Flood estimation for small catchments, Institute of Hydrology (Report No. 124)

events. The lighter blue areas are likely to represent areas of the site where the topography allows the accumulation and saturation of peat and soils from subsurface or surface means during prolonged and/or intense rainfall events. The results of the TWI suggest that the area of greatest flow accumulation and saturation of peat/soils occur within the riparian corridors of the mapped watercourses and potential flush zones. These conditions are considered to be conducive to supporting GWDTE. Whilst it is recognised that other areas of the site are likely to become saturated, it is expected that any saturation will be dependent upon climatic conditions such as the intensity and duration of rainfall.

Figure 10.4 in Volume 3 of the ES shows the groundwater flooding is most likely to occur at the base of slopes and along river valleys. These areas generally coincide with areas of higher TWI (above 15). The hydrogeological conditions at the proposed development are discussed in paragraphs 10.5.38 to 10.5.42 and it is expected that the hydrogeological conditions of the underlying bedrock described in those paragraphs is not conducive to supporting GWDTE. Groundwater flow within the superficial geology is likely to be inhomogeneous due to the varying permeability of the mapped superficial deposits, namely peat underlying the site. It is expected that the hydrogeological conditions of the superficial deposits do not significantly limit the movement of groundwater within the valleys of the watercourses but movement may be restricted in the summit and plateau areas across the proposed development.

Cumulative Flood Risk

10.5.25 As outlined within the Paul's Hill II Wind Farm Scoping Report (see Appendix 1.1), flood risk has been predominantly scoped out of the ES based on the identification of a negligible risk. However, given the presence of the Pauls Hill Wind Farm adjacent to the proposed Paul's Hill II Wind Farm Development, there is a possibility that surface or riverine flooding could be accentuated downstream through the cumulative impacts associated with an increase in the area of ground served by anthropogenic drainage networks.

Water Quality

10.5.26 Three watercourses that drain the site, detailed in Table 10.9, have been classified under the Scotland's Environment Water Body Classification Application[7]. The water quality classification looks at both biological and chemical indicators of pollution. The overall status is based on a number of parameters including access for fish migration and freedom from invasive species and overall status is based on the lowest status within the whole data set. The data in the Scotland's Environment mapper of relevance to hydrology have been provided by SEPA. The details of the watercourses that are within or downstream of the Paul's Hill II Development Area are provided in Table 10.9 below.

Table 10.9: RBMP classification of Watercourses within the vicinity of the site

		Future Objectives			
River		**2014**	**2021**	**2027**	**Long Term**
Allt Arder	Overall Status	High	High	High	High
	Water Quality	High	High	High	High
	Water Flows and Levels	High	High	High	High
Allt Gheallaidh	Overall Status	Good	Good	Good	Good
	Water Quality	High	High	High	High
	Water Flows and Levels	High	High	High	High
	Overall Status	Moderate	Good	Good	Good
River Spey – (River Avon to River Fiddich)	Water Quality	Good	Good	Good	Good
	Water Flows and Levels	Good	Good	Good	Good

[7] Scotland's Environment (2018) https://www.environment.gov.scot/our-environment/water/scotland-s-freshwater/

Water Resources

10.5.27 Scottish Water was contacted during the scoping exercise and a response was received. Scottish Water records indicate that there are no Scottish Water water abstraction sources, which are designated as Drinking Water Protected Areas under the Water Framework Directive that may be affected within the proposed Paul's Hill II Wind Farm Development. With regards to off-site sources, Scottish Water did indicate the presence of Spey Boreholes and Ordiequish Collecting Chamber situated 30 km downstream near Fochabers.

10.5.28 SEPA were contacted to establish if there are any abstractions or discharges within 5 km of the proposed wind farm development. SEPA responded to confirm that they had no licences located within this area.

10.5.29 Moray Council were contacted about the presence of Private Water Supplies (PWS) both within the Planning Application Boundary and within a 3 km buffer.

10.5.30 It was confirmed that there are four source areas within the 3 km search area serving 40 properties. One supply sourced from the Mannoch Spring (NJ 179 458) produces water for 33 separate properties and is maintained by the Knockando Estate. The information on these supplies has been presented within Table 10.10 below, with the locations also presented in Figure 10.1 in Volume 3 of the ES. A full list of the 36 properties supplied by PWS ID 36a is demonstrated in the Appendix in 10.7 in Volume 4 of the ES.

Table 10.10: Private water Supplies within the 3 km of the Planning Application Boundary

TMC PWS ID	Property Name	Type of Supply	Domestic (D)/ Agricultural (A)	Property within catchment occupied by proposed infrastructure	Property within catchment occupied by existing access track	Distance of source from Infrastructure (km)
36a	36 properties listed to be supplied by the Knockando Estate from Mannoch Spring	Spring	D	No	No	6.6[1]
36b	Leakin, Garlinebeg & Garlinemore	Borehole	D	No	Yes	0.95
219	Corglas Lodge & Corglas Beag	Spring	D	No	Yes	0.21
387	Glenarder	Spring	D	No	Yes	0.32

1 – Distance to individual property supplied by source will vary.

Source: The Moray Council.

The PWS sources and properties have been considered further in Technical Appendix 10.7: Private Water Supply Risk Assessment. Paragraphs 10.5.38 - 10.5.42 below provide more information on the hydrogeological characteristics of the site and surrounding area. Based on this information and responses to the PWS questionnaire sent to all residents it is likely that the hydrogeological catchments are constrained by the same topographic controls as the surface water catchments.

Soils and Peat

10.5.31 The distribution of soils across the proposed Paul's Hill II Wind Farm development is dependent upon land use, geology, topography and hydrological regime of the area. Information on soils has been provided by the Hutton Institute, specifically from Sheet 5[8], Scotland's National Soil Map available from Scotland's Environment Mapper[9] and also from SNH – Carbon Soils Map (2016)[10]. Table 10.11 below provides a summary of the soils present within the Paul's Hill II Development Area.

Table 10.11: Summary of Soil Types

Soil Association	Parent Material	Component Soils	Area of Soil Association Present within boundary (km²)
Organic soils	Organic deposits	Blanket peat (incorporating hill peat)	1.22
Arkaig	Drifts derived from schists, gneisses, granulites and quartzites principally of the Moine Series	Peaty gleyed podzols with dystrophic blanket peat (Peaty Podzols)	0.52
		Noncalcareous gleys with peaty gleys (Mineral Gleys)	0.16
		Humus-iron podzols (Mineral Podzols)	0.71

10.5.32 The above soils information indicates that blanket peat and hill peat dominate the Paul's Hill II Development Area. The main peat soil classes categorised according to the SNH – Carbon Soils Map (2016)[14] are shown below in Table 10.12. Classes 1 and 2 are defined as being of national importance.

Table 10.12: Summary of Peat Soil Classifications

Soil Classification	Area of Peat Soil Classification Present within Boundary (km²)	Percentage of total site area (%)
Non-soil	0.005	0.21
Mineral Soil	0.534	22.49
Class 1	1.194	50.28
Class 2	0.409	17.24
Class 3	0.027	1.14
Class 4	0.178	7.51
Class 5	0.026	1.11

10.5.33 Peat is a soft to very soft, highly compressible, highly porous organic material that can consist of up to 90 – 95% water, with 5 – 10% solid material[11]. Unmodified peat consists of two layers; a surface acrotelm which is usually 10 – 30 cm thick, highly permeable and receptive to rainfall. Decomposition of organic matter within the acrotelm occurs aerobically and rapidly. The acrotelm generally has a high proportion of fibrous material and often forms a crust in dry conditions.

10.5.34 A second layer, or catotelm, lies beneath the acrotelm and forms a stable colloidal substance which is generally impermeable. As a result, the catotelm usually remains saturated with little groundwater flow. Peat is thixotropic, meaning that the viscosity of the material decreases when stress is applied. The thixotropic nature of peat may be considered less important where the peat has been modified through artificial drainage or natural erosion and is drier, but will be significant when the peat body is saturated.

10.5.35 Due to the distribution of peat and peaty soils underlying the proposed Paul's Hill II Wind Farm Development a peat depth and peat slide risk assessment has been carried out. There are a number of drainage and geotechnical issues associated with constructing and operating developments on such environments.

10.5.36 Technical Appendix 10.2: Peat Stability Risk Assessment in Volume 4 of the ES provides details on the methodologies adopted to complete the peat slide risk assessment and Technical Appendix 10.3: Peat Management Plan outlines the volumes of peat that will be excavated and reinstated. Table 10.13 below and following information provide a summary of the peat depths recorded during field surveys.

Table 10.13: Summary of Recorded Peat Depths

Peat Depth Range (m)	Results	% of Points
< 0.1	65	10
0.1 – 0.5	319	47
0.5 – 1.0	199	29
1.0 – 1.5	73	11
1.5 – 2.0	15	2
2.0 – 2.5	5	1
>2.5	6	1
TOTAL	**682**	**100**

10.5.37 The peat depths within the proposed Paul's Hill II Wind Farm Development are predominantly less than 1.0 m. 15% of the peat depth probes were recorded as greater than 1.0 m. The peat interpolation in Technical Appendix 10.2: Peat Stability Risk Assessment shows that the area is generally underlain by peat up to 1 m deep. There are localised areas where peat depths exceed 1 m and these generally occur in areas where contours widen and the land flattens out. From the data available peat depth is greater and more variable with the Allt Arder catchment.

Hydrogeology

10.5.38 Groundwater information has been recorded using published data sources and from observations made during the field surveys.

10.5.39 The aquifer classification map from the Scotland's Environment website[12] shows that the site has low aquifer productivity. The Grampian Group Precambrian rocks which underlie the site are highly metamorphosed, with

[8] Macaulay Institute, Soil Survey of Scotland, Aberdeen – Sheet 5, Eastern Scotland (1981)

[9] Scotland's Environment – http://www.environment.scotland.gov.uk/ accessed 01/11/2017

[10] Scottish Natural Heritage – Carbon Soils Map (2016). Available at http://www.snh.gov.uk/planning-anddevelopment/advice-for-planners-and-developers/soils-and-development/cpp/ (accessed 01/11/2017)

[11] J. Warburton, J. Holden and A.J.Mills, (2004), Hydrological controls of surficial mass movements in peat, Earth-Science Reviews, 67, 139 – 156

[12] http://www.environment.scotland.gov.uk/get-interactive/map-view/ accessed 09/08/2015

negligible intergranular porosity and low permeability. Virtually all water flow is through fractures and other discontinuities including weathered zones.

10.5.40 SEPA do not keep groundwater depth information for the area and there are also no BGS borehole records indicating possible water head depths within the proposed Paul's Hill II Wind Farm Development. There are also faults or linear features mapped to underlay the proposed development.

10.5.41 The proposed Paul's Hill II Wind Farm Development is partially covered by peat or peat rich soils, which forms a minor aquifer. Groundwater within such peat aquifers is generally perched on the less permeable basement they overlie. The peat aquifers, together with the weathered bedrock zone are likely to provide base flow to the local surrounding watercourses. In lower lying areas of lesser relief the water table generally occurs at or just below the surface. This is demonstrated by the presence of areas of saturated ground across the Paul's Hill II Development Area.

10.5.42 If present, groundwater movement within the bedrock will be extremely limited, with flow direction and velocity a function of fracture aperture, fracture orientation and weathered extent. Percolation of surface waters into these areas will be restricted by the commonly low permeability of the superficial till, containing variable quantities of clays, sand and gravel. Given the likely heterogeneous distribution of groundwater within these sediments and the bedrock, it is thought the primary store for groundwater within the proposed Paul's Hill II Wind Farm development will be within the overlying peat deposits.

Groundwater Dependent Terrestrial Ecosystems (GWDTE)

10.5.43 As discussed in Section 7.4of Chapter 7: Ecology of the ES, and shown on figure 7.5 in Volume 3 of the ES, a National Vegetation Classification (NVC) survey was undertaken in 2014 for the proposed development with an additional survey of the core development area completed in the summer 2017. The surveys have concluded that moderately or highly dependent GWDTE habitats are not situated extensively across the site boundary. The majority of the habitats are classified as Blanket Bog (M19), Dry Bog (H12a) or Modified Bog (M20) with only isolated areas of Acid Flush (M6c) or Wet Heath (M15). These areas of highly dependent GWDTE habitats were generally situated in locations with high TWI values and were usually within close proximity to watercourses / watercourse headwaters.

10.5.44 The low permeability of the underlying bedrock and superficial sediments means the most productive subsurface strata will be the superficial peat accumulations, with the greatest capacity in areas of deep peat, in topographic hollows where flush zones have formed, or where regular recharge is achieved from minor watercourses. Therefore, the hydrogeological conditions within the superficial aquifers along the riparian corridors and valleys of watercourses may be conducive to supporting GWDTE due to the good hydraulic connectivity. Areas away from these are likely to have limited, heterogeneous groundwater movement, suggesting that highly or moderately dependent species away from minor watercourses and flush zones are unlikely to be GWDTE and are instead supported by rainfall or overland flow.

10.5.45 An assessment of GWDTE presented in Technical Appendix 10.8: Ground Water Dependent Terrestrial Ecosystem Assessment of the ES. The GWDTE classification for the recorded NVC is presented in the Technical Appendix

Modifying Influences

10.5.46 Information regarding climate change was obtained from the UK Climate Projections (UKCP09) website[13]. The UKCP09 is a climate analysis tool which features comprehensive projections for different regions of the UK. Climate information was taken for the area of North Scotland based on a high emissions scenario. According to these predictions winter mean temperature will increase by 2% and summer mean temperature will increase by 2.1% by the 2020's. It is also predicted that annual precipitation will increase by 8% with an increase in winter mean precipitation of 14% and a decrease in summer precipitation of 3% by the 2020's.

10.5.47 Warmer and wetter winters suggest less snow and more rain. This will create increased risk for flood events, and issues with water quality as less precipitation will be held in its frozen state during the winter season. If climate predictions are correct, summer months will become dryer. This will create pressure on the needs of water abstractions and on sensitive ecosystems that rely on aquatic habitats. Evidence also suggests that although the summer months will have an average decrease in rainfall, summer storms will be more frequent and intense. This may lead to more extreme flow values during and immediately following such events, with consequential flooding and water quality issues. This is of key importance for the hydrological environment during summer construction periods.

10.5.48 It is suggested that increased temperatures in the summer could also increase evapotranspiration and potentially cause desiccation of peat[14]. The desiccation could result in the peat being more susceptible to erosion due to increased intensity in summer storms and increased rainfall during the winter months.

10.5.49 As peat and peat dominant soils are composed of vegetation remains they contain a high proportion of carbon compared to other soils. Thus, the process that forms peat effectively locks away atmospheric carbon. It is believed that loss of peatland could lead to the release of carbon into the atmosphere contributing to greenhouse gas concentrations which are believed to be one of the main drivers of climate change.

10.6 EFFECT EVALUATION

Basis of Assessment

10.6.1 The proposed development is located on the hills of Carn na Dubh-chlais in Moray and is an extension of the existing Paul's Hill Wind Farm.

10.6.2 The proposed Paul's Hill II Wind Farm will comprise of 7 turbines (6 at 149.9 m to tip height and 1 to 134 m to tip height), site tracks, crane pads, foundations, underground electricity cables, two borrow pits, extension of use of consented operations and control building and temporary construction and storage compounds, and associated works/infrastructure. The associated infrastructure from the existing Paul's Hill Wind Farm Development will be utilised where practicable and possible. The existing access track to the existing Paul's Hill Wind Farm will be used also be used as access for the proposed wind farm development. Dependant on the choice of turbine it is possible that the existing access to Paul's Hill Wind Farm may require some upgrade work. It is assumed for the purpose of determining this application that any such works will not have an adverse effect on the River Spey and other hydrological receptors. The environmental impacts of these works will be confirmed prior to construction, assuming as stated in section 4.5 of Chapter 4: Description of Development.

10.6.3 Typically, the construction phase will involve a period of earthworks, track construction and excavations for forming turbine bases. Following this, the turbine bases and infrastructure will be installed and finally the turbines will be transported to site and erected.

10.6.4 The total permanent land take during construction after completion of reinstatement of the proposed Paul's Hill II Wind Farm development will be approximately 6.06 ha (0.061 km^2).

Mitigation by Design (Embedded Mitigation)

10.6.5 A summary of the hydrological influences on the project layout are given below with full details of the project design provided in Chapter 3: Site Selection and Evolution, of the ES. Due to the nature of the environment occupied by the proposed Paul's Hill II Wind Farm development it is imperative that the design and infrastructure helps maintain or even improve the local hydrology. Poor design of development infrastructure can result in significant implications to the hydrological environment with secondary effects on peat stability and ecology.

[13] Defra (2009), UK Climate Projections 09, http://ukclimateprojections.defra.gov.uk/content/view/12/689/, accessed 25/01/2018

[14] The Scottish Government (2008), The Scottish Soil Framework: A Consultation Document

10.6.6 The findings of the peat depth and Peat Stability Risk Assessment (Technical Appendix 10.2: Peat Stability Risk Assessment in Volume 4 of the ES), show that the infrastructure has as far as possible, taking into account other constraints, been sited outside areas of deeper peat. The peat depths across the proposed Paul's Hill II Development Area are predominantly shown to be in a moderate shallow range (0.75 m and 0.4 m respectively) when considering the discrete turbine and access track areas only.

10.6.7 The hydrological desktop study and site visits have identified a typical upland hydrological environment, with a number of hydrological pathways and features associated with it. A series of buffer distances have been adopted to help reduce effects of the proposed Paul's Hill II Wind Farm on the hydrological environment. A 50 m buffer was implemented for all identified natural hydrological features.

10.6.8 Table 10.14 confirms that all turbines and crane pads associated with the proposed Paul's Hill II Wind Farm development are located outside the 50 m buffer limits. Distances were calculated using functionalities provided within the QGIS package. Watercourses are linear features that were identified from aerial photography, OS 1:10,000 raster data as well as any additional features identified during the site visit. A blanket buffer of 50 m was established for such features.

Table 10.14: Distance of Turbines from Identified Hydrological Features

Turbine ID	Turbine Distance from Watercourses (50 m Buffer)
1	126.0
2	59.7
3	62.7
4	182.4
5	446.0
6	471.2
7	122.7

10.6.9 The design of the infrastructure has also meant that the associated access tracks are located greater than 50 m from natural hydrological features. However, where access necessitates essential watercourse crossing, construction features have been limited in these buffers as far as possible, for example, minimising tracks running parallel to watercourses and trying to avoid track junctions being constructed in these zones. The exceptions to this are where access tracks have to cross watercourses or when other constraints have resulted in the tracks having to infringe upon the edges of the buffers of ephemeral headwater drainage channels.

10.6.10 Proposed watercourse crossings associated with a total of 3.3 km of new access track required as part of the proposed Paul's Hill II Wind Farm development will be minimised to three in total. With the exception of the identified watercourse crossings, no areas of infrastructure are located within the adopted 50 m buffers.

10.6.11 Design of infrastructure has been situated to avoid areas of potential GWDTE, with respective buffer distances of 100 m and 250 m applied to GWDTE locations that are moderately or highly dependent refer to Technical Appendix 10.8 Groundwater Dependent Terrestrial Ecosystem Assessment Figure 10.14. In circumstances where infrastructure falls within these buffers, efforts will be made to ensure the continuity of groundwater flows within the peat and near surface soils. This will be achieved through both considerate construction design and / or the use of appropriate diversion drainage channels to ensure groundwater dependent recharge areas are not hydrogeological severed from reliant habitats. General embedded mitigation which will help protect GWDTE is provided below with more specific mitigation within Technical Appendix 10.8: Groundwater Dependent Terrestrial Ecosystem Assessment,

Mitigation

10.6.12 As outlined in Section 10.3.3 under the recently introduced Water Environment (Miscellaneous) (Scotland) Regulations 2017 the proposed wind farm development could require a construction site licence under CAR for water management across the entirety of the construction site prior to any construction works taking place, including enabling works. A Pollution Prevention Plan (PPP) may also requirepreparation and agreement with SEPA prior to the commencement of work on site. The need for these licences and a potential PPP would be addressed post consent and prior to any construction activities taking place.

10.6.13 A number of planning, design and construction proposals have been identified during the assessment. Full details of the assumed best practice construction management and embedded mitigation measures will be provided in a CEMP which would be prepared post consent as part of the conditions discharge process. A summary of the measures which would be included within the CEMP are described below and have been assumed to be part of the proposals when the residual effects and their significance are reported. Any further embedded mitigation, specific to the proposed Paul's Hill II Wind Farm development, but still considered best practice is also provided in further detail in the following paragraphs.

10.6.14 A number of the embedded mitigation measures described in the following paragraphs can also be adopted during the operational phase of the proposed Paul's Hill II Wind Farm development. To avoid duplication of text, the reference to what stage the measures can be adopted is provided in the following paragraphs.

General Site Pollution Control

10.6.15 A specific CEMP will ensure that best practice measures are put in place and activities carried out in such a manner as to prevent or minimise effects on the surface and groundwater environment. To secure this commitment a planning condition similar to 7.4 of the existing Paul's Hill Wind Farm could be applied. The CEMP will be prepared prior to commencement of construction but will include information as follows:

- *Drainage* – all runoff derived from construction activities and site infrastructure will not be allowed to directly enter the natural drainage network. All runoff will be adequately treated via a suitably designed drainage scheme with appropriate sediment and pollution management measures. The proposed Paul's Hill II Wind Farm development is situated in an upland hydrological area and it is imperative that the drainage infrastructure is designed to accommodate storm flows based on a 1 in 200 year event + climate change to help maintain the existing hydrological regime.
- *Storage* – all soil/peat stockpiles as well as equipment, materials and chemicals will be stored well away from any watercourses. Chemical, fuel and oil stores will be sited on impervious bases with a secured bund.
- *Vehicles and Refuelling* – standing machinery will have drip trays placed underneath to prevent oil and fuel leaks causing pollution. Where practicable, refuelling of vehicles and machinery will be carried out in designated areas, on an impermeable surface, and well away from any watercourse.
- *Maintenance* – only emergency maintenance to construction plant will be carried out on the proposed Paul's Hill II Development Area, in designated zones, on an impermeable surface well away from any watercourse or drainage, unless vehicles have broken down necessitating maintenance at the point of breakdown, where special precautions will be taken.
- *Welfare Facilities* – on-site welfare facilities will be adequately designed and maintained to ensure all sewage is disposed of appropriately. This may take the form of an on-site septic tank with soakaway, or tankering and off-site disposal depending on the suitability of the site for a soakaway and prior agreement with SEPA.
- *Cement and Concrete* – fresh concrete and cement are very alkaline and corrosive and can be lethal to aquatic life. The use of wet concrete in and around watercourses will be avoided and carefully controlled.
- *Monitoring Plans* - all activities undertaken as part of the proposed Paul's Hill II Wind Farm development will be monitored throughout the construction phase. Such monitoring will be to ensure environmental compliance. Water quality monitoring will also occur throughout each phase of the proposed Paul's Hill II Wind Farm

development and will help to maximise the effectiveness of embedded mitigation measures whilst monitoring effects on the hydrological environment.

- *Contingency Plans* – plans will ensure that emergency equipment is available on site i.e. spill kits and absorbent materials, advice on action to be taken and who should be informed in the event of a pollution incident.
- *Training* – All relevant staff personnel will be trained in both normal operating and emergency procedures, and be made aware of highly sensitive areas on site.

10.6.16 Further details regarding the pollution prevention and embedded mitigation measures that will be adopted during the construction and operation of the proposed Paul's Hill II Wind Farm development are detailed in the following paragraphs.

Runoff and Sediment Management

10.6.17 The following measures will be adopted to appropriately attenuate and treat runoff during construction and operation of the proposed Paul's Hill II Wind Farm development.

10.6.18 The site drainage system will convey water away from construction activities as well as proposed Paul's Hill II Wind Farm development infrastructure. However, due to the nature of the works on site and the negligible infiltration and storage capacity of the underlying peat and bedrock there is significant potential for sediment and other pollutants to become entrained in the surface runoff.

10.6.19 To reduce this potential it will be ensured that prior to the commencement of work and during construction that figures showing site drainage and hydrologically sensitive areas are regularly checked to review potential for runoff and ponding of water across the proposed Paul's Hill II development area to ensure that runoff patterns are well known.

10.6.20 The drainage systems installed on the proposed Paul's Hill II Wind Farm development will also have sediment management measures incorporated into their design to help reduce or wholly mitigate effects on the hydrological environment. The type of sediment management will depend on the volume of construction activities occurring in particular areas across the proposed Paul's Hill II development area. For all of the suggested control measures regular inspection and maintenance is necessary, particularly after prolonged heavy rainfall.

10.6.21 Silt traps will be installed within the proposed Paul's Hill II Wind Farm development drainage system. Silt traps could take the form of terram fences or clean stone. However, the ability of the silt traps to successfully treat runoff will be dependent upon the permeability of the terram geotextile material and the size and source of the clean stone.

10.6.22 The ability of silt traps to effectively treat runoff will depend upon the volume of runoff within the drainage channel, the type of material used and the frequency of monitoring and replacement of the measures.

10.6.23 If required, flocculents could also be used to treat runoff. Flocculents are very effective at removing suspended sediment from water but they can also have effects on water chemistry. As such, it is recommended that SEPA are consulted prior to the use of flocculents.

Pumping and Dewatering of Excavations

10.6.24 All pumping operations e.g. removal of water from turbine base excavations, will be carried out in line with best practice and where necessary in line with the requirements of The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended)[15] prior to the works being undertaken. Suitable measures to minimise the impact of the pumped water on the hydrological environment shall be taken. These measures shall include, but are not limited to, the following techniques.

10.6.25 Due to the expected low permeability of the site soils it is expected that the potential for groundwater ingress would be low. The time that excavations are open will be kept to a minimum to prevent water ingress and de-watering upslope. The ingress of surface water into the excavations will be minimised through the use of up gradient drainage measures e.g. cut-off ditches, this will also prevent shallow throughflow entering excavations. It is recognised that water can still enter the excavation and would need to be removed. This can be achieved by allowing the water to gravity drain to a designated area before being pumped from the excavation to a predesigned settlement lagoon or other suitable silt treatment area. The settlement lagoons would attenuate and treat runoff before discharging back into the natural drainage network, mimicking natural flow patterns as far as possible.

10.6.26 Due to the peat and peaty soils on site the throughput rate of runoff within the settlement treatment areas would be reduced to give longer settlement time within the excavations and settlement tanks. If required, a series of settlement lagoons or other silt treatment measures can be deployed to allow maximum settlement of sediment during the construction period.

10.6.27 The treated water from the settlement lagoons or other silt treatment measures will not be discharged directly into watercourses but directed onto vegetated surfaces where appropriate. Any sediment within the treated water will be deposited amongst the rough surface vegetation, away from sensitive habitats or watercourses.

10.6.28 To reduce the likelihood of erosion channels being formed by the discharge from the sediment treatment outfalls it is recommended that the water is discharged at a slow rate, or spread evenly across a surface. For discharge onto rough vegetation to be effective the discharge must be spread efficiently and the vegetation, soils and topography be carefully considered to determine an appropriate discharge location. For example, filtering the water through a length of pipe with multiple discharge points will allow attenuation as well as diffuse dispersion, thus reducing the erosive potential of the runoff.

10.6.29 The discharge can also utilise silt traps, silt fencing or other attenuation measures. The utilisation of such measures could help to prevent the formation of erosion channels.

10.6.30 To maximise the efficiency of the settlement measures e.g. Silt busters or other holding lagoons or tanks, the sediment sludge that collects at the base will be removed as required.

Storage of Fuels/Chemicals and Bunding Arrangements

10.6.31 Throughout the construction and to a lesser extent during the operational phase of the proposed Paul's Hill II Wind Farm development a number of oils and chemicals will be used. Such materials will be used and stored in a safe manner to ensure that the surface and groundwater environment is not adversely affected.

10.6.32 The following measures will be adopted to protect the surface and groundwater environment from the inappropriate storage and use of substances hazardous to the environment:

- All equipment, materials and chemicals to be stored away from any watercourses. Chemicals, fuel and oil will be stored in tanks of sufficient strength and structural integrity to ensure that it is unlikely to burst or leak in ordinary use. They will also be sited on impervious bases within a secured bund of 110% of the storage capacity;
- Where oil is stored in a bunded area, oil residue can build up. This residue build up will reduce the storage capacity of the bund and will be removed regularly. The residue will be disposed of by a specialist contractor;
- Locks shall be fitted to all fuel storage tanks or containers and there shall be a nominated trained person to oversee the refuelling and delivery to ensure there is no spillage; and
- Standing machinery to have drip trays placed underneath to prevent oil and fuel leaks causing pollution. Where practicable refuelling of vehicles and machinery will be carried out at a central designated area, on an impermeable surface, which will be located at least 50 m away from any watercourses.

[15] Scottish Environment Protection Agency (2011), The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended): A Practical Guide, Version 8 January 2018

Refuelling

10.6.33 A fuel bowser will be used for refuelling on the access tracks or hardstanding. The bowser driver shall be responsible for ensuring that refuelling of mobile plant does not take place within 50 m of a watercourse. The bowser driver will receive extra training on spill prevention and response.

10.6.34 The refuelling bowser shall be equipped with a mobile spillage control kit containing oil absorbent booms and mats. All site personnel will be trained in their use as part of the site induction training or toolbox talks. Special attention will be paid to spillage control at watercourses.

10.6.35 Oil booms will be provided and maintained downstream of the works at all watercourse locations that the access track crosses for the duration of the construction period to act as a defence against the unlikely event of an oil or fuel spillage.

Vehicle Maintenance and Management

10.6.36 All plant used during the construction of the proposed Paul's Hill II Wind Farm development will be in suitable condition and fit for purpose to carry out the works and will be maintained as per manufacturers guidelines.

10.6.37 Maintenance of construction plant to be carried out in designated areas, on an impermeable surface away from any watercourse or drainage. Only if vehicles have broken down will maintenance be permitted out with a designated area, and this would only be carried out after implementing special precautions. Such precautions include, but are not limited to:

- Ensure that drip trays are placed underneath vehicle during maintenance;
- As a precautionary measure, ensure that straw bales or entrapment matting are placed downstream of the maintenance area;
- All heavy construction plant will be inspected daily by the operating personnel and any defects or issues resolved immediately prior to starting works. All heavy construction plant shall be issued with spill-kits. Should a spillage occur, larger spill kits shall also be positioned at various areas of the proposed Paul's Hill II development area which will be highlighted to all operatives during the site induction; and
- Standing machinery and plant will have drip trays placed underneath to prevent oil and fuel leaks causing pollution. Where practicable refuelling of vehicles and machinery will be carried out at a central designated area, on an impermeable surface, which will be located at least 50 m away from any watercourses.

Concrete Works

10.6.38 Concrete would be required for the construction of the wind turbine foundations. The following section provides best practice measures that are required to be implemented to prevent detrimental effects to the hydrological environment.

10.6.39 Care will be taken to ensure that the transportation of concrete to the turbine and building foundations uses best practice measures. Freshly mixed concrete and/or dry cement powder will not be allowed to enter any watercourse. This will be ensured by:

- Locating turbines and concrete batching or wash out areas at least 50 m from watercourses;
- Concrete wagons will only be permitted to wash-out into specifically designed wash-out areas and predetermined at agreed locations site wide;
- The drivers will be informed at their site induction of the location of the designated wash-out areas and issued with a location map;
- Loads will be managed and assessed with regards to the size of vehicle and ground conditions whilst keeping at appropriate speed limits to avoid spillage.
- Tools and equipment will not be cleaned in watercourses. Should it be necessary to clean tools and equipment on site, this will be done in the predetermined wash-out areas.
- A designated concrete wash out will be constructed within the Paul's Hill II development area at a location agreed with the relevant consultees to ensure protection of watercourses. The design and construction of these wash out areas will be agreed with SEPA; and
- Wash out areas will be continually monitored and findings recorded to ensure effluent levels do not spill over into the environment.

Site Drainage

10.6.40 The following section discusses the conventional site drainage measures that can be installed during the construction and operation of the proposed Pau's Hill II Wind Farm development.

10.6.41 Surface drainage ditches will be installed alongside tracks only where necessary. The length, depth and gradient of individual drains will be minimised to avoid intercepting large volumes of diffuse overland flow and generating high velocity flows during storm events. Sediment traps, settlement ponds and buffer strips will be incorporated into the drainage system as necessary and will serve the dual purpose of attenuating peak flows, by slowing the flow of runoff through the drainage system, and allowing sediment to settle before water is discharged from the drainage system[16].

10.6.42 As well as utilising sediment traps, structures such as v-notched weirs and/or check dams will be installed within the drainage channels. Such structures will throttle the flow within the channel, thus reducing erosive potential of any runoff and allowing sediment and/or pollutants to settle.

10.6.43 Access tracks crossing slopes will disrupt surface flow that consequently will collect in drains constructed upslope of the tracks. Cross-drains and or waterbars will be constructed at regular intervals to conduct this surface flow below or across the track where it will be discharged back into the drainage system, although all efforts will be made to segregate this runoff from more silty runoff originating from track surfaces and other exposed construction areas, thus reducing the silt load and volume discharging to all silt treatment areas. Regular discharge points will limit the concentration of surface runoff and the diversion of flows between catchments. Such cross drains need to be strong enough to withstand the expected traffic loadings[16].

10.6.44 During storm events there is likely to be some ponding on the uphill side of tracks, as percolation alone is unlikely to be able to accommodate surface flows. To minimise this ponding, small diameter cross drains or perforated pipes (similar to plastic pipe field drains) would be incorporated into the track base at regular intervals to allow more flow to pass through the track and maintain the current flow regime. It is recommended that such pipes are surrounded by free draining material that is wrapped in a separator geotextile. The number of pipes and associated dimensions will be dependent upon the width of the flush/boggy area/ proximity to GWDTE and the hydrological regime[17.]

10.6.45 Prior to track construction, site operatives will identify flush areas, depressions or zones which may concentrate water flow. These sections will be spanned with plastic pipes to help maintain hydraulic conductivity under the road, and reduce water flow over the road surface during heavy precipitation.

10.6.46 Due to the poor permeability of the surrounding peat, peaty soils and bedrock, it is also recommended that drains and/or cut-off drains are installed on the upstream/upgradient sides of the turbine foundations, crane hardstandings, and other excavations required across the proposed Paul's Hill II Wind Farm development. The purpose of this will be to help reduce the volume of surface water runoff entering the excavations and minimise any subsequent contamination.

10.6.47 The constructed drainage system will not discharge directly to any natural watercourse, but will discharge to buffer strips, trenches or SUDS measures, preferably on flatter, lower lying ground. These buffers will act as filters and

[16] Scottish Natural Heritage, Scottish Environmental Protection Agency (2015), Good Practice During Windfarm Construction, v3

[17] Forestry Civil Engineering and Scottish Natural Heritage (2010), Floating Roads on Peat: A Report into Good Practice in Design, Construction and Use of Floating Roads on Peat with particular reference to Wind Farm Developments in Scotland,

will minimise sediment transport, attenuate flows prior to discharge and maximise infiltration back into the soils and peat.

10.6.48 Drainage from the construction compound, welfare facilities, borrow pits and concrete wash out areas will be collected and treated separately from the main site drainage, as the runoff from these areas is more likely to be contaminated and therefore will require treatment. Appropriate treatment, such as oil interceptors and treatment for high alkalinity, will be installed.

10.6.49 As discussed in the Mitigation By Design (Embedded Mitigation) section above, three new watercourse crossings will be required as part of the construction and subsequent operation of the proposed Paul's Hill II Wind Farm development (see Technical Appendix 10.6: Watercourse Crossing Assessment in Volume 4 of the ES). The crossings will be appropriately designed so that they do not alter the natural drainage, hinder the passage of aquatic fauna and can accommodate flow for a 1:200yr + climate change event. All watercourse crossings will be designed with edge upstands or bunds e.g. straw bales, sandbags or silt fences to prevent sediment laden runoff from construction plant movement from directly entering watercourses. Relevant CAR Authorisation from SEPA will be sought for construction of the crossings that are required over watercourses that are displayed on the 1:50,000 OS Landranger maps.

Welfare Facilities/Foul Water

10.6.50 The following measures will be adopted for the design of the foul water drainage system:

- Any sewage associated with the temporary construction compound, the control buildings and welfare facilities will be collected in appropriately sized interceptor (septic) tanks and shall be located at the construction compound and at the control building. All wash basins, toilets and shower areas shall also be connected to an interceptor tank; and
- The interceptor tanks and the tanks within any site portable toilets, which shall be situated not less than 50 m from any watercourse, will be emptied regularly by a suitably licensed contractor. Sewerage from these facilities will be disposed of off-site in accordance with waste management legislation.

Sustainable Water Management

10.6.51 To reduce the impact of the proposed Paul's Hill II Wind Farm development on the natural hydrological regime, the site design will aim to mimic the greenfield runoff response at source through the use of sustainable drainage practices.

10.6.52 As detailed in the SEPA guidance document (SEPA 2011) under General Binding Rule 10, Sustainable Urban Drainage Systems (SUDS) should be taken into consideration as part of the water management:

"If the surface water run-off is from areas constructed after 1 April 2001, the site must be drained by a Sustainable Urban Drainage System (SUDS). If the surface water run-off is from a construction site operated after 1 April 2007, the site must be drained by a SUD system or equivalent. The only exceptions are if the run-off is from a single dwelling and its curtilage, or if the discharge is to coastal water."

10.6.53 SUDS are used to attenuate rates of runoff from development sites and can also have water purification benefits. The implementation of SUDS as opposed to conventional drainage systems provides several benefits by:

- Reducing peak flows to watercourses and potentially reducing risk of flooding downstream;
- Reducing the volumes and frequency of water flowing directly to watercourses;
- Improving water quality by removing pollutants;
- Reducing potable water demand through rainwater harvesting; and
- Replicating natural drainage patterns, including the recharge of groundwater so that base flows are maintained.

10.6.54 Whilst it is understood that the scope for SUDS measures is limited as a result of the hydrological environment it is recommended that the installed drainage measures adopt the principles highlighted above.

Emergency Water Management Measures

10.6.55 As previously mentioned a significant volume of oils and chemicals will be stored on site during the construction phase and to a lesser extent the operational phase. Site traffic will also be present in significant numbers during the construction phase of the proposed Paul's Hill II Wind Farm development, with traffic volumes significantly reduced during wind farm operation.

10.6.56 The appropriate storage of oils, chemicals and maintenance of site plant has been discussed above. However, despite these measures, accidents can happen and these can have significant impacts upon the quality of the surface and groundwater environment. The following emergency procedures can be implemented to ensure that the surface and groundwater environment is protected during wind farm construction and operation:

- All relevant on-site staff to be trained in both normal operating and emergency procedures, and be made aware of highly sensitive areas on site. The staff training and implementation of site procedures will be overseen by the Infrastructure Contractor to ensure that these measures are carried out effectively to minimise the risk of a pollution incident;
- Contingency plans that ensure that emergency equipment is available on site (i.e. spill kits and absorbent materials), and that advice is provided on actions to be taken and who would be informed, in the event of a pollution incident;
- Contingency planning procedures must be regularly reviewed to include changes to site operations that were not foreseen during design;
- The procedures set out in site contingency plans need to be prepared in conjunction with the assessment of the risk of a pollution incident occurring and the measures to be taken to minimise pollution. The location of the procedures will be publicised and it is essential that they are set out clearly so that they can easily be understood and acted upon; and
- The emergency procedures can include the following:
  - Containment measures;
  - Emergency discharge routes;
  - List of appropriate equipment and clean-up materials;
  - Maintenance schedule for equipment;
  - Details of trained staff, location, and provision for 24-hour cover;
  - Details of staff responsibilities;
  - Notification procedures to inform the relevant environment protection authority;
  - Audit and review schedule;
  - Telephone numbers of statutory and local water company; and
  - List of specialist pollution clean-up companies and their telephone numbers.

Receptor Sensitivity

10.6.57 On the basis of the baseline surveys and available information, Table 10.5 above identifies the sensitivity of receptors as outlined in Table 10.15 below with justification for their categorisation.

Table 10.15: Receptor Sensitivity

Receptor	Sensitivity	Comment
Surface Water		

Receptor	Sensitivity	Comment
Water Quality		
Allt Arder (Caochan Liath & Blarnish Burn)	Medium	Caochan Liath and Blarnish Burn are classed as having good ecological potential as part of SEPAs RBMP. Tributaries aiming for High overall long term status by 2027 as part of SEPAs RBMP. Rivers support fish populations which are dependent on good water quality.
Allt a' Gheallaidh (Tod's Burn and Allt a' Mhonaidh)	Medium	Tod's Burn and Allt a' Mhonaidh are classed as having Good overall long term status as part of SEPAs RBMP. Tributaries aiming for Good ecological potential by 2027 as part of SEPAs RBMP. Rivers support fish populations which are dependent on good water quality.
River Spey (River Avon to River Fiddich)	High	The River Spey (River Avon to River Fiddich) is classed as having Good overall long status by 2027 as part of SEPAs RBMP. The River Spey and its tributaries are a SSSI and SAC for Atlantic Salmon, Freshwater Pearl Mussels, Sea Lamprey and Otter.
Flooding (Cumulative Risk Only)	Low	Landtake of infrastructure has the potential to increase response to peak flow events by increasing the volume of runoff entering artificial drainage and watercourses especially when cumulative impacts are considered alongside additional discharge from the existing Paul's Hill Wind Farm.
Water Resources		
Private Water Supplies	Medium	Private supplies are located between 0.21 km and 6.6 km from nearest existing proposed Paul's Hill development infrastructure. Potential for contaminants associated with proposed Paul's Hill II Wind Farm development construction and operation to leach into surrounding bedrock and affect the quality and quantity of water serving the supplies.
Public Supply Source (Spey Boreholes and Ordiequish Collecting Chamber)	Low	Major water abstraction point situated a significant distance (30 km) from the proposed Paul's Hill II development area.
Soils and Hydrogeology		
Site soils and peat	Medium	Peat is an Annex I habitat that is susceptible to degradation that could result in sedimentation of watercourses Some boggy areas and peat are present across the proposed Paul's Hill II development area
Hydrogeology and groundwater	Medium	Bedrock aquifers are vulnerable to pollution as a result of groundwater flow dominated by natural joints and fissures. Groundwater flow in cracks and joints offers little attenuation to pollutants. The bedrock aquifer underlying the proposed Paul's Hill II Wind Farm Development according to SEPA is of 'good overall status'. Three of the private water supplies rely on groundwater as a source.
GWDTE	High/Medium	GWDTE are habitats categorised under the requirements of the Water Framework Directive (2000/60/EC). Habitats are vulnerable to change through change in the groundwater regime. Sensitivity is derived from the potential for the habitats to be groundwater dependent as per SEPA guidance documents LUPS4 & 31

Predicted Construction Effects

10.6.58 The potential for effects on the hydrological environment is greatest during the construction phase due to the high levels of activity on-site and when there is greatest change to the existing environment. Taking into account the embedded mitigation and management measures discussed in paragraphs 10.6.5 to 10.6.56 the following paragraphs discuss the potential effects that can still occur during the construction of the proposed Paul's Hill II Wind Farm development.

10.6.59 The evaluation of construction effects is provided in Table 10.16 below. The table assumes the successful implementation of the embedded mitigation measures provided in paragraphs 10.6.5 to 10.6.56.

Pollution Incidents

10.6.60 During the construction phase, a number of potential pollutants will be present onsite, including oil, fuels, chemicals, unset cement and concrete, waste and waste water from construction activities and staff welfare facilities. The majority of these potential pollutants will be located or stored within the construction compound, which is located in the catchment of the Allt a' Gheallaidh. In addition, there is the potential for contamination of the hydrological and peatland environment caused by spillages along the access tracks and construction areas.

Erosion and Sedimentation

10.6.61 Soil and peat erosion and sediment generation may occur in areas where the ground has been disturbed, particularly where surface runoff has been concentrated. Drainage ditches are particularly prone to this problem,

due to the high velocities of surface water runoff passing through the drainage network. Considerable sediment generation is expected where the ground has been excavated for the proposed Paul's Hill II Wind Farm development infrastructure.

10.6.62 Sediment transport in watercourses can result in high turbidity levels which can impact on the water quality, particularly affecting the ecological potential of the watercourses. High turbidity in watercourses can reduce the light and oxygen levels in the watercourses, while sediment deposition can smother plant life and spawning grounds. Sediment deposition can also reduce the flood storage capacity of the watercourses and block culverts, resulting in an increased flood risk.

10.6.63 As a result of construction operations, all catchments with new and upgraded infrastructure present, regardless of embedded mitigation, are vulnerable to erosion and sedimentation.

Increase in Runoff

10.6.64 Turbine bases, hardstanding areas and access tracks will act as impermeable areas, restricting the natural movement of water within the hydrological environment, potentially resulting in increased rates of runoff into the onsite sub catchments to the Allt Arder and Allt a' Gheallaidh catchments. The position of the catchments relative to the infrastructure infers potential impact within the Allt a' Gheallaidh will be lower than the Allt Arder.

10.6.65 Localised increases could cause issues for downstream flood storage capacity and/or pollution incidents. Increases in the volume of runoff entering watercourses could also cause erosion and sedimentation, therefore having detrimental effects on surface water hydrology and fishery resources.

Modification of Surface Drainage Patterns

10.6.66 The interception of diffuse overland flow by the proposed Paul's Hill II Wind Farm development infrastructure and associated drainage may disrupt the natural drainage regime of the area, concentrating flows and potentially diverting flows from one catchment to another. This may have implications on flood issues downstream of the proposed Paul's Hill II Wind Farm development as well as depriving peat of surface flows that can help maintain hydrological continuity between peat bodies.

Impediments to Surface Water Flow

10.6.67 The construction of watercourse crossings may restrict flow in the various channels and reduce hydraulic capacity, resulting in an increase in flood risk, and promotion of erosion and sedimentation. In addition, poorly designed watercourse crossings may impede the migration of fish and mammal movement in the riparian corridor.

Modification of Groundwater Flow and Levels

10.6.68 Deep excavations, such as those required for the turbine foundations are likely to disrupt the shallow groundwater systems within the peat and superficial geology. Due to the poor permeability of the underlying peat and peaty soils groundwater ingress is expected to be minimal. Surface water ingress will be minimised utilising upgradient cut-off drains or other drainage measures. The installation of cut-off drains has the potential to lower local groundwater levels within the surrounding peat and/or peat dominated soils.

10.6.69 Access tracks are likely to bisect hydrogeological units in the peat, interrupting shallow groundwater flow. Cut and fill tracks also have the potential to disrupt existing sub-surface drainage networks as a result of the removal or compression of the peat and/or peat dominated soils. The removal or compression of the peat/peat soils will result in an alteration to the existing hydrological regime that will cause the build-up of water on the upslope side of construction and the reduction in water on the downslope side. This build-up of water can cause ponding which can increase the shear stress on the peat. Drying out of peat on the downslope site could cause desiccation of the peat which will make it more susceptible to erosion.

10.6.70 In areas where there is a concentration of access tracks and drainage, there is the potential for more widespread lowering of the water table, resulting in the indirect and long-term impact on the future restorability and functionality of adjacent peat as well as affecting the overall integrity of peatland environments. Modifications to the hydrogeological regime could also have influences on GWDTE. Further information on the assessment of effects of the proposed Paul's Hill II Wind Farm Development on GWDTE are presented in Technical Appendix 10.8: Groundwater Dependent Terrestrial Ecosystems Assessment.

Peat Instability

10.6.71 Peat slides do occur naturally, however, because of the remote nature of most peatlands, the frequency of natural events may be under reported. As a result, peatslides and their causes are poorly understood, although it is recognised that they are the result of multiple causes.

10.6.72 A peatslide occurs when a portion of the peat mass becomes detached and flows downhill, usually as blocks of solid peat rafted upon a slurry of semi-liquid peat. A peatslide may have a significant effect on river water quality and ecology, particularly fish stocks. The land affected by peatslides usually re-vegetates quite rapidly, although the original balance of vegetation species is unlikely to be re-established as a consequence of the changes in local topography and drainage patterns. Where peat habitats or future restoration have been identified, peat instability can have serious and detrimental effects.

10.6.73 A Peat Stability Assessment can be found in Technical Appendix 10.2: Peat Stability Risk Assessment in Volume 4 of the ES. A geotechnical engineer would normally be employed onsite during construction to undertake advance inspection, carry out regular monitoring and provide advice whilst work is ongoing. The creation and management of a geotechnical risk register will form an important aspect of the development of the proposed Paul's Hill II Wind Farm development.

Compaction of Soils

10.6.74 The movement of construction traffic throughout the proposed Paul's Hill II development area is likely to cause compaction in the peat, leading to changes in both the hydrological and hydrogeological regime. The impacts of compaction are likely to be highly localised but will damage the vegetation, and result in a reduction in the soil permeability and rainfall infiltration, thereby increasing the potential for localised flood risk and erosion as well as increasing the risk of peatslide. Increasing the potential for flood risk and erosion or a peatslide event could also have direct effects on surface water quality and fisheries, as well reducing the potential for enhancement/restoration of peat.

Assessment of Construction Effects

10.6.75 Table 10.16 below identifies the likely construction effects on the identified receptors and their significance assuming the successful implementation of best practice and embedded mitigation measures provided in 10.6.5 to 10.6.56 above. The assessment is based on the criteria outlined in paragraphs 10.4.5 - 10.4.9 above. Note that with the exception of Cumulative flood risk which is assessed below that flooding has been scoped out,

Table 10.16: Assessment of Construction Effects

Potential Effects	Identified Receptor(s)	Sensitivity	Magnitude of Effect	Significance of Effects Post Embedded Mitigation
Surface water				
Water quality				
Pollution incidents	Caochan Liath	Medium	Low	**Minor/Moderate**
Erosion and sedimentation	Blarnish Burn	Medium	Low	**Minor/Moderate**
Acidification	Tod's Burn	Medium	Negligible	**Minor**
Increase in Runoff	Allt a' Mhonaidh	Medium	Negligible	**Minor**
Modifications to Surface Drainage Pattern	River Spey (River Avon to River Fiddich)	High	Negligible	**Minor**
Impediments to Surface Water Flow				
Peat Instability				
Flooding (Cumulative Flood Risk Only)				
Increase in runoff				
Modifications to Surface Drainage Patterns	On site watercourses (inc associated tributaries)	Low	Negligible	**Negligible/Minor**
Impediments to Surface Water Flow				
Compaction of Soil				
Water Resource				
Pollution incidents	Mannoch Spring (Knockando Estate) supply for 36 properties	Low	Negligible	**Negligible**
Modifications to Surface Drainage Patterns				
Impediments to Surface Water Flow	Leakin, Garlinebeg & Garlinemore	Low	Negligible	**Negligible**
Modification of Groundwater Flows and Levels	Corglas Lodge & Corglas Beag	Medium	Low	**Minor/Moderate**
Compaction of Soil	Glenarder	Low	Negligible	**Negligible**
	Public Supply Source (Spey Boreholes and Ordiequish Collecting Chamber)	Low	Negligible	**Negligible**
Soils, and Hydrogeology				
Soils and Peat				
Pollution incidents	Site Soils and Peat	Medium	Low	**Minor/Moderate**
Modification to Surface Drainage Patterns				
Impediments to Surface Water Flow				
Modifications of Groundwater Flows and Levels				
Peat Instability				
Compaction of Soil				
Hydrogeology				
Pollution incidents	Underlying groundwater aquifers	Medium	Low	**Minor/Moderate**
Acidification				
Modifications to Surface Drainage Patterns	Groundwater within peat	Medium	Low	**Minor/Moderate**
Modification of Groundwater Flows and Levels				
Peat Instability	GWDTE	High/Medium	Low	**Minor/Moderate**
Compaction of Soil				

Predicted Ongoing and Operational Effects

10.6.76 The effects of the proposed Paul's Hill II Wind Farm Development are expected to be substantially lower during the operational phase. The following paragraphs discuss the potential effects that are predicted to occur during the operational phase of the proposed Paul's Hill II Wind Farm Development.

Pollution Incidents

10.6.77 The potential risk of pollution is substantially lower during operation than during construction because of the decreased levels of activity in the operational phase. The majority of potential pollutants will have been removed when construction is complete; however, lubricants for turbine gearboxes, transformer oils and possible fuel leaks from maintenance vehicles and seepage from septic tanks will remain.

Erosion and Sedimentation

10.6.78 Levels of erosion and sedimentation during operation will be much lower than construction as there will be no excavations or bare exposed ground. Some erosion and sedimentation is still possible on site tracks and drainage ditches as a result of scouring during extreme rainfall events. Similarly, there could be some erosion and sedimentation around new stream crossings as watercourses reach new equilibrium.

Modification of Surface Drainage Patterns

10.6.79 Modification of surface runoff will occur as a result of the construction of the new infrastructure associated with the proposed Paul's Hill II Wind Farm Development. The operational effects are likely to result in changes to volume and/or changes to runoff rate.

10.6.80 Site tracks and associated drains will intercept some overland flow, interrupting the natural drainage regime by concentrating flows and potentially diverting them from one catchment to another. Poorly designed site tracks and associated drainage could allow surface water to travel through a catchment much faster than if it were to travel as diffuse overland flow. This could result in an increase in runoff rates, peak flows and influence response times during storm events. The permanent landtake for the proposed Paul's Hill II Wind Farm development will be 6.06 ha (0.061 km2).

Impediments to Surface Water Flow

10.6.81 During the operational phase impediments to flows can generally occur as a result from blockages to watercourse crossing, ditches and watercourses resulting from vegetation and erosion debris.

Modification of Groundwater Flow and Levels

10.6.82 Tracks and their drainage as well as turbine foundations and hardstandings will potentially alter the water table within the upslope and downslope peat and upper bedrock aquifers, which can also have implications for the long term functionality of peatland environments. Backfilled cable trenches can also provide preferential flow pathways for groundwater.

Peat Instability

10.6.83 It is recognised that natural peat failure may still occur during the operational phase of the proposed Paul's Hill II Wind Farm development. However, there is also the potential for the construction activities to increase the risk of peat slide during this phase. For example, the construction of tracks parallel to the slope can result in the removal of peat that subsequently increases the upslope pressure on the exposed peat face. Changes in the hydrological connectivity of the peat could result in the build-up of water upslope that could subsequently fail over a period of time. The risk of instability during operation will be addressed through the implementation of appropriate embedded mitigation during construction and an ongoing appraisal of peat slide will be carried out across the proposed Paul's Hill II development area throughout the operation of the proposed Paul's Hill II Wind Farm development.

10.6.84 Full details of the measures that can be implemented to mitigate effects on the stability of peat are provided in Technical Appendix 10.2: Peat Stability Risk Assessment in Volume 4 of the ES. The creation and management of a geotechnical risk register will form an important aspect of the site development.

Compaction of Soils

10.6.85 The compaction of soils/peat is likely to be significantly reduced during the operational phase as a result of less heavy traffic movement.

Assessment of Predicted Operational and Ongoing Effects

10.6.86 Table 10.17 below identifies the likely operational effects on the identified receptors and their significance assuming the successful implementation of the best practice and embedded mitigation measures provided in paragraphs 10.6.5. – 10.6.56. Note that with the exception of Cumulative flood risk which is assessed below that flooding has been scoped out,

Table 10.17: Assessment of Operational and Ongoing Effects

Potential Effects	Identified Receptor(s)	Sensitivity	Magnitude of Effect	Significance of Effects Post Mitigation
Surface water				
Water quality				
Pollution incidents	Caochan Liath	Medium	Negligible	**Minor**
Erosion and sedimentation	Blarnish Burn	Medium	Negligible	**Minor**
Acidification	Tod's Burn	Medium	Negligible	**Minor**
Increase in Runoff	Allt a' Mhonaidh	Medium	Negligible	**Minor**
Modifications to Surface Drainage Pattern	River Spey (River Avon to River Fiddich)	High	Negligible	**Minor**
Impediments to Surface Water Flow				
Peat Instability				
Flooding (Cumulative Flood Risk Only) -				
Increase in runoff				
Modifications to Surface Drainage Patterns	On site watercourses (inc associated tributaries)	Low	Negligible	**Negligible/Minor**
Impediments to Surface Water Flow				
Compaction of Soil				
Water Resources				
Private Water Supplies				
Pollution incidents	Mannoch Spring (Knockando Estate) supply for 36 properties	Low	Negligible	**Negligible/Minor**
Acidification				
Modifications to Surface Drainage Patterns				
Impediments to Surface Water Flow	Leakin, Garlinebeg & Garlinemore	Low	Negligible	**Negligible/Minor**
Modification of Groundwater Flows and Levels	Corglas Lodge & Corglas Beag	Low	Negligible	**Negligible/Minor**
Compaction of Soil	Glenarder	Low	Negligible	**Negligible/Minor**
	Public Supply Source (Spey Boreholes and Ordiequish Collecting Chamber)	Low	Negligible	**Negligible/Minor**
Soilsand Hydrogeology				
Soils and Peat				

Potential Effects	Identified Receptor(s)	Sensitivity	Magnitude of Effect	Significance of Effects Post Mitigation
Pollution incidents Modification to Surface Drainage Patterns Impediments to Surface Water Flow Modifications of Groundwater Flows and Levels Peat Instability Compaction of Soil	Site Soils and Peat	Medium	Negligible	**Minor**
Hydrogeology				
Pollution incidents Modifications to Surface Drainage Patterns	Underlying groundwater aquifers	Medium	Negligible	**Minor**
Modification of Groundwater Flows and Levels	Groundwater within peat	Medium	Negligible	**Minor**
Peat Instability Compaction of Soil	GWDTE	High/Medium	Negligible	**Minor/Moderate**

Predicted Cumulative Effects

10.6.87 The application of a hydrological catchment methodology enables a logical evaluation of the potential for cumulative effects of the hydrological environment.

10.6.88 As shown in Table 6.7: Cumulative Baseline Developments in Chapter 6: Landscape and Visual Assessment, of the ES, there are two existing/consented wind farms (theexisting Paul's Hill Development and Berryburn Wind Farm) within a radius of 5 km of the proposed Paul's Hill II Wind Farm Development, however one, the existing Paul's Hill development, is within the same surface water catchment (River Spey catchment) as the proposed Paul's Hill II Wind Farm development.

10.6.89 The operation of the existing Paul's Hill Wind Farm as well as the proposed wind farm development has the potential to cumulatively affect the water quality, flooding and fisheries interests associated with the River Spey. However, taking into account that construction of the existing wind farm development has already occurred there would not be a concurrent impact during construction of the proposed wind farm development and assuming the successful implementation of detailed mitigation (following best practice) and monitoring plans it is expected that any cumulative effects would be of **minor significance**.

Monitoring

10.6.90 A programme of surface water quality monitoring will be finalised post consent, prior to construction. A breakdown of the proposed monitoring methodologies has been provided to take into account sensitivities of the on-site and downstream environments.

10.6.91 The details of any required monitoring should be discussed and agreed with SEPA, and TMC prior to commencement. The extent and the frequency of the monitoring will be proportionate to the level of activity on site during the construction, operation and decommissioning of the proposed Paul's Hill II Wind Farm development. Appropriate monitoring is important to:

- Provide reassurance that established in-place embedded mitigation measures are effective and that the proposed Paul's Hill II Wind Farm development is not having any significant adverse impact upon the E
- Indicate whether further investigation is required and, where pollution is identified, the need for additional embedded mitigation measures to prevent, reduce or remove any impacts on the water environment; and
- Understand the long term effects of the proposed Paul's Hill II Wind Farm Development on the natural environment.

10.6.92 A baseline surface water monitoring programme will be undertaken prior to the commencement of construction works. The establishment of a baseline is very important as it provides a suite of parameters against which to compare samples taken during the proposed Paul's Hill II Wind Farm development's lifetime, and with which to assess any impacts and the requirement for any appropriate remedial measures. However, due to the variance in climatic conditions, recording like for like water quality prior to and during construction is likely to be unusual. Therefore, it is also recommended that control sites, situated outside the area affected by the proposed Paul's Hill II Wind Farm development infrastructure are also established at the time.

10.6.93 It is also recommended that a suitably qualified Environmental Clerk of Works (ECoW) is employed throughout the construction of the proposed Paul's Hill II Wind Farm development. The appointed consultant can provide advice to the contractors about how environmental effects can be minimised, and what methods can be employed to reduce effects on water quality, the peat and associated habitats.

10.6.94 Monitoring should be undertaken throughout construction of the proposed Paul's Hill II Wind Farm development. The monitoring will help to identify areas where infrastructure is having a negative effect on peat and peaty soils as well as GWDTE and utilise the appropriate methods to prevent further deterioration and/or promote further enhancement.

10.6.95 The monitoring methodologies detailed below are designed to monitor the effects of the proposed Paul's Hill II Wind Farm development on the quality of the hydrological environment, including peat and GWDTE. It is also recommended that a suitably qualified geotechnical engineer is appointed to monitor the risk of peatslide that could have secondary effects on water quality.

10.6.96 It is also recommended that all construction management and water management techniques are agreed prior to construction. The techniques would be agreed following consultation with SEPA, and TMC.

10.6.97 The monitoring programme will be site-specific and tailored so as to provide a meaningful and pragmatic indication of the state of the water environment. A summary of the elements associated with the monitoring programme are provided below:

- Periodic and ad-hoc sampling and analysis of surface water during construction in order to complement the programme of visual inspection. Periodic analysis enables monitoring of trends in levels of critical parameters so that deviations from the norm can be identified and actioned;
- Regular visual inspection of surface water management features such as culverts and receiving watercourses in order to establish whether there are increased levels of suspended sediment, erosion or deposition. It is likely that there will be an ongoing need to maintain these structures, for example by the removal of debris, to ensure they continue to function as designed;
- Regular visual inspection of watercourses during construction and decommissioning stages, particularly during periods of high rainfall, in order to establish that levels of suspended solids have not been increased by on-site activities; and
- Additional monitoring as required as a condition of discharge consents, abstraction licences or other environmental regulation.

10.6.98 Technical Appendix 10.7: Private Water Supply Risk Assessment identified a Medium/Low risk to Corglass Lodge, Corglass Beag (219) as a result of potential impact during planned resurfacing work to the existing access track. It is recommended that monitoring at both source and point of consumption is carried out during this upgrade work. Agreement with the property owner, monitoring frequency and parameters monitored would be agreed post consent. Monitoring regime would conform to the relevant guidance & best practice statements e.g. Private Water Supplies: Technical Manual[18] or The Microbiology of Drinking Water – Part 2 – Practices and procedures for sampling[19].

Residual Effects

10.6.99 The Chapter has identified that there will be no significant effects from the proposed Paul's Hill II Wind Farm development on the hydrological, hydrogeological and geological environment and therefore it can be concluded that no residual effects will take place.

10.7.1 An assessment has been carried out of the likely impacts of the proposed Paul's Hill II Wind Farm development on the hydrological, hydrogeological and geological environment. The assessment has considered site preparation, construction and operation of the proposed Paul's Hill II Wind Farm development.

10.7.2 The potential effects on the surface waters, groundwater, peat, designated sites, GWDTE and private water supplies that have been considered are:

- Pollution Incidents;
- Erosion and sedimentation;
- Changes to water resources i.e. private water supplies;
- Modification of surface water and groundwater flows;
- Modification of natural drainage patterns;
- Impediments to flow and flood risk;
- Peat instability; and
- Compaction of soils.

10.7.3 Following the identification and assessment of the key receptors, taking into account the potential effects listed above, a comprehensive suite of embedded mitigation and best practice measures has been incorporated into the design, including extensive buffer areas. In addition, a site specific CEMP as well as detailed design of infrastructure and associated embedded mitigation will be implemented to protect the groundwater and surface water resources from pollution and minimise changes to the hydrological environment.

10.7.4 The impact assessment has taken into account the hydrological regime, highlighting that the principal effects will occur during the construction. Assuming the successful design and implementation of embedded mitigation measures the significance of construction effects on all identified receptors is considered to be of minor or no significance. The assessment of predicted ongoing and operational effects has also determined that the significance of effects on all receptors to be of **minor/moderate minor or no significance.**

10.7.5 The significance of effects on the site hydrological, hydrogeological and geological conditions are **not significant** under the terms of Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000 and Amendment Regulations 2008.

10.7.6 Table 10.18 below summarises the potential impacts of the proposed Paul's Hill II Wind Farm development, the embedded mitigation proposed and the residual impact once implemented.

Table 10.18: Summary of Potential Impacts of the proposed development.

Likely Significant Impact	Embedded Mitigation Proposed	Means of Implementation	Outcome/Residual Impact
Construction			
Detrimental impacts to on-site and downstream water quality **Detrimental effects to on-site and downstream fisheries as a result of changes to water quality** **Increases to on-site and downstream flood risk as a result of poor construction practices (including poor construction of watercourse crossings)**	Appropriate drainage design that incorporates sediment management measures to attenuate and treat runoff from construction activities. Appropriate storage and handling of potential pollutants. Refuelling of construction plan in designated areas. Adoption and agreement on emergency measures should significant effects occur.	Preparation of a site specific CEMP prior to construction. Hydrological elements of the CEMP will include, but not be limited to the following: A Drainage Management Plan; Watercourse crossing assessment (detailed design prior to construction); Water quality monitoring programme (prior to and during construction.	**Minor/Moderate**
Disruption to private water supplies and water resources as a result of introducing contaminants to hydrogeological pathways as well as altering existing flow patterns	Appropriate storage and handling of potential pollutants. Refuelling of construction plan in designated areas. Adoption and agreement on emergency measures should significant effects occur. Identification and confirmation of all private water supply sources during the detailed design stage prior to construction. If required, carry out water sampling of supplies prior to and during construction to ascertain effects of construction on water quality.	Preparation of site specific CEMP prior to construction. Hydrological elements of the CEMP can include, but not limited to the following: A Drainage Management Plan;	**Minor/Negligible**

[18] Scottish Executive. 2006. *Private Water Supplies: Technical Manual*. Available at http://www.privatewatersupplies.gov.uk/private_water/files/Full%20Doc.pdf (accessed 10/01/2018)

[19] Environment Agency.2010. *The Microbiology of Drinking Water – Part 2 – Practices and procedures for sampling*. Available at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/316769/MoDW-2-232.pdf (accessed 10/01/2018)

Likely Significant Impact	Embedded Mitigation Proposed	Means of Implementation	Outcome/Residual Impact
Degradation of peat or peat dominated soils and GWDTE as a result of interrupting surface and sub-surface drainage pathways, especially in areas of ecological groundwater dependency	Appropriate drainage design that incorporates sediment management measures to attenuate and treat runoff from construction activities. Measures will be designed to encourage water retention within peat/soils. Identification of subsurface hydrological pathways prior to construction. Appropriate design of watercourse crossings in areas of flushes. Appropriate use of drainage design to ensure hydrogeological continuity when infrastructure dissect GWDTE. Monitoring will also be undertaken to ensure preservation of the hydrogeological conditions.	Preparation of site specific CEMP prior to construction. Hydrological elements of the CEMP can include, but not limited to the following: Drainage Management Plan (designed to maintain drainage pathways); Water quality monitoring programme (including groundwater level monitoring in peat or peat dominated soils), Area specific mitigation for GWDTE is detailed in Appendix 10.8 Groundwater Dependent Terrestrial Ecosystem Assessment	**Minor/Moderate**
Increase risk of peat slide risk assessment as a result of poor construction and management of peat stockpiles	Adoption of a geo-technical risk register. Appropriate storage and re-use of peat /soils in line with current best practice guidelines and site conditions.	Geotechnical Risk Register	**Minor/Moderate**
<u>Operation</u>			
Detrimental impacts to on-site and downstream water quality through degradation of proposed Paul's Hill II Wind Farm Development infrastructure and poor storage of materials	Appropriate drainage design that incorporates sediment management measures to attenuate and treat runoff from wind farm infrastructure.	Operational drainage and monitoring plan (designed prior to construction). Plan can detail the appropriate monitoring methods, including:	**Minor/Moderate**
Detrimental effects to on-site and downstream River Spey SAC as a result of changes to water quality (as described above) **Increases to on-site and downstream flood risk as a result of degradation of infrastructure and/or poor maintenance/monitoring of infrastructure** **Long term disruption of private water supplies as a result of changes to hydrogeological regime as well as poor storage and handling of chemicals**	Appropriate storage and handling of potential pollutants. Adoption of a long term monitoring programme to monitor degradation of infrastructure (including the removal of blockages from watercourse crossings).	Visual monitoring and completion of checklists signed off by SEPA; Regular water quality monitoring for a period post construction to determine potential long terms effects of wind farm on water quality. Private water supply management plan (including emergency pollution response plan).	
Long term degradation of peat as a result of interrupting surface and sub-surface drainage pathways. Disruption of drainage patterns can cause pooling and/or desiccation of peat as well as impacts on ecological groundwater dependent areas.	Appropriate drainage design that incorporates sediment management measures to attenuate and treat runoff from wind farm infrastructure. Appropriate re-use and management of waste peat in line with principles of best practice guidance and site conditions.	Peat reuse and management plan outlined in Technical Appendix 10.3: Peat Management Plan	**Minor**
Increase risk of peatslide as a result of desiccation or wetting of peat. Risk can also increase due to settlement of infrastructure that disrupts hydrological pathways	Appropriate drainage design that incorporates sediment management measures to attenuate and treat runoff from proposed Paul's Hill II Wind Farm Development infrastructure. Long term monitoring of peat/soils to determine any issues with stability.	Geotechnical Risk Register	**Minor**

Document history

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Issue	Date	Revision Details
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Chapter 11

Aviation and Existing Infrastructure

Contents

Glossary

Term	Definition
Environmental Impact Assessment	Environmental Impact Assessment (EIA) is a means of drawing together, in a systematic way, an assessment of the likely significant environmental affects arising from a proposed development
Environmental Statement	A document reporting the findings of the EIA and produced in accordance with the EIA Regulations
The Existing Paul's Hill Wind Farm	The 'existing Paul's Hill Wind Farm' refers to the operational Paul's Hill Wind Farm.
The Proposed Development	The proposed Paul's Hill II Wind Farm
The Proposed Development Area	Red line boundary (application area)

List of Abbreviations

List and describe your abbreviations here.

Abbreviation	Description
ATC	Air Traffic Control
CAA	Civil Aviation's Directorate of Airspace
CMS	Construction Method Statement
DIO	Defence Infrastructure Organisation
EIA	Environmental Impact Assessment
ES	Environmental Statement
GIS	Geographical Information System
HIAL	Highlands & Islands Airports Ltd
INV	Inverness Airport
JRC	Joint Radio Company
MoD	Ministry of Defence

11.1 INTRODUCTION

11.1.1 In this chapter, consideration has been given to the potential for impact upon civil aviation interests, Ministry of Defence (MoD) interests, communication operations and existing site infrastructure. This chapter assesses such potential impacts and demonstrates the consultation process undertaken, provides details of any impacts and outlines mitigation where it is deemed necessary.

11.1.2 This assessment was undertaken using two main desktop study methods. These were: GIS searches using published constraints data and consultation with statutory bodies and network operators. The initial feasibility assessment has also included input from aviation consultant, Coleman Aviation, who has discussed with the MoD and HIAL and provided advice on potential impacts and mitigation measures related to RAF Lossiemouth radar and Inverness Airport radar respectively.

11.2 MILITARY AVIATION

11.2.1 The proposed development is 29.5km from, detectable by, and will cause interference to the ATC radar used by RAF Lossiemouth.(see MoD letter dated 24th May 2017 in Technical Appendix 1.2 in Volume 4 of the S ES)

11.2.2 The MoD letter stating that the MoD objects to the proposal unless the developer is able to overcome the issues stated in the letter, specifically:

i. *Restrictions the development would impose upon departure routes including Standard Instrument Departures (SIDS);*

ii. *Restrictions the development would impose upon approach and arrival procedures;*

iii. *Restrictions the development would impose upon LARS/ZONE traffic patterns;*

iv. *Restrictions the development would impose upon special tasks conducted by the Unit;*

v. *Restrictions the development would impose upon Tactical Aid to Navigation (TACAN) procedures;*

vi. *Air traffic density in the vicinity of the proposed windfarm;*

vii. *Existing clutter or windfarms in the vicinity of the proposed windfarm;*

viii. *The type and characteristics of aircraft routinely using the airspace in the vicinity of the proposed windfarm;*

ix. *The performance of the radar;*

x. *The complexity of the ATC task;*

xi. *The workload of controllers.*

11.2.3 The MoD further stated that if these issues could be overcome '*the MOD will request that all turbines be fitted with MOD accredited 25 candela omni-directional red lighting or infrared lighting with an optimised flash pattern of 60 flashes per minute of 200ms to 500ms duration at the highest practicable point'.*

11.2.4 Coleman Aviation was subsequently commissioned to review the MoD objection and provide advice as to the likelihood of removing the MoD objection or negotiating a mitigation solution to the satisfaction of the MoD. Coleman Aviation was set up by Wing Commander Mike Coleman (Retd) to provide independent consultancy services to the wind farm industry on aviation issues. Mike retired from the RAF in December 2012 after 27 years' service. His last appointment was as Head of the ATC and Air Defence (AD) operational teams responsible for responding to wind farms on behalf of the MoD. In this role, he defined RAF policy for dealing with the operational impact of wind turbines on ATC radars and was pivotal in deciding whether objections against wind farms should be lodged. Since leaving the RAF, he has worked for over five years as an aviation consultant and provided advice to numerous wind farm developers in resolving wind farm-related aviation issues.

11.2.5 Consultation with the MoD is ongoing. However, in recent discussions the MoD has revealed that they are unwilling to consider accepting the impact of the 7 Paul's Hill II turbines despite the fact that they are currently managing the impact of 23 turbines from the original Paul's Hill development, which has been operational since 2006, These turbines are routinely visible to the Lossiemouth ATC radar. In assessing the extensive list of issues raised by the MoD (paragraph 11.2.2 i - xi), it was evident that each identified issue is as a direct result of the potential impact of the Paul's Hill II turbines on the ATC radar itself. Consequently, if it was possible to resolve one issue by means of a radar mitigation solution, every issue identified by the MoD would also be resolved. Furthermore, even if it was possible to resolve all but one of the issues, the MoD would still maintain their objection. In terms of mitigation, the MoD now has a recognised process for entering into mitigation agreements with developers. Consultation with the MoD will continue and if the objection cannot be overcome, detailed mitigation discussions will commence. Mitigation can be secured through an appropriate planning condition.

11.2.6 The MOD will be consulted and notified throughout the planning application process to ensure that any changes will not adversely affect defence interests.

11.3 AIR TRAFFIC – CIVIL AVIATION

The CAA

11.3.1 The Civil Aviation's Directorate of Airspace (CAA) has provided a Scoping Opinion (see Technical Appendix 1.2: Scottish Government Final Scoping Opinion in Volume 4 of the ES). CAA provided a response which suggests consultation with other bodies and states the need for turbines to be charted on aviation maps following consent. The Applicant would comply with any such requirement to liaise with the Defence Geographic Centre to facilitate this.

11.3.2 As all of the turbines at Paul's Hill II Wind Farm will be below 150m, there will be no requirement for mandatory aviation lighting in relation to civil aviation interests.

11.3.3 There will be ongoing dialogue with the CAA throughout the development process to ensure that it is kept up to date with layout revisions and turbine specifications.

11.3.4 Aberdeen Airport indicated in their scoping response that the proposal is located outwith their consultation zone and no further consultation is needed (see Technical Appendix 11.1),

NATS

11.3.5 In relation to National Air Traffic Services (NATS), the proposed development has been examined and does not conflict with their safeguarding criteria (see Technical Appendix 11.1). NATS therefore have no safeguarding objection to the proposal.

11.3.6 If there are any layout changes throughout the application process NATS will be kept up to date with layout revisions and turbine specifications.

Inverness Airport

11.3.7 Highlands and Islands Airport Limited (HIAL) has stated with their scoping response (see Technical Appendix 11.1):

'The turbines could possibly affect the performance of electronic aeronautical systems for the airport. HIAL would not wish to see a degradation of any of these services, particularly the Radar installation. (At 150m these turbines are likely to be in line of sight of the radar).

It should be noted that HIAL would work with the developer towards a resolution. However, HIAL are likely to object any proposal which impacts on the Radar, unless an acceptable solution can be found to mitigate the effect on Inverness Airport's operation'.

11.3.8 The nearest turbine is 37.6 km from the Inverness Airport radar. A line of sight assessment indicates that 2 turbines (T6 & T7) are visible to the radar (Figure 11.1). As can been seen in the figure, the two turbines are at the periphery of the radar's visibility. Communications are ongoing with HIAL/Inverness airport to discuss appropriate mitigation. Mitigation can be secured through an appropriate planning condition.

Highland Gliding Club

11.3.9 Highland Gliding Club provided a scoping response by email on the 17th August 2017. They indicated that a decision was taken by the club not to make any representations at this stage, although they reserve the right to make representations at some point in the future.

11.4 MICROWAVE AND RADIO COMMUNICATION LINKS

11.4.1 Fixed microwave links are direct line-of-sight communication links between transmitting and receiving dishes placed on masts generally located in prominent locations that vary in length from a few kilometres to over 70 km. They are used for the transmission of information to broadcasting masts for TV, radio and mobile telephone networks. There are two fixed microwave links within the proposed development area (see ES Figure 11.1).

11.4.2 Ofcom were contacted with turbine coordinates and dimensions on the 9th October 2017. At the time of writing they have made no observations about the proposed development.

11.4.3 An initial scoping opinion issued by JRC (see Technical Appendix 1.2: Scottish Government Final Scoping Opinion in Volume 4 of the ES) indicated that 2 links would be potentially affected by the proposed development. These were identified as:

SSE 0929271/1

SCHY 0929271/1

Communication with JRC has been undertaken in January to March 2018 and a detailed assessment has now been undertaken regarding the potential interference to the link. The assessment identified that it is only T7 that could potentially interfere with the link, and mitigation is possible. Potential mitigation measures include agreeing to a micro-siting restriction ensuring that the turbine position does not move closer to the link or upgrade of the antenna (if the former is not possible). Refer to the note from JRC for confirmation of the requirements of the link owner (see Technical Appendix 11.1). The mitigation could be secured through a planning condition.

11.4.4 BT also commented that it has no objection (see Technical Appendix 11.1). BT concluded following an assessment that, *'the project should not cause interference to BT's current and presently planned radio networks'.*

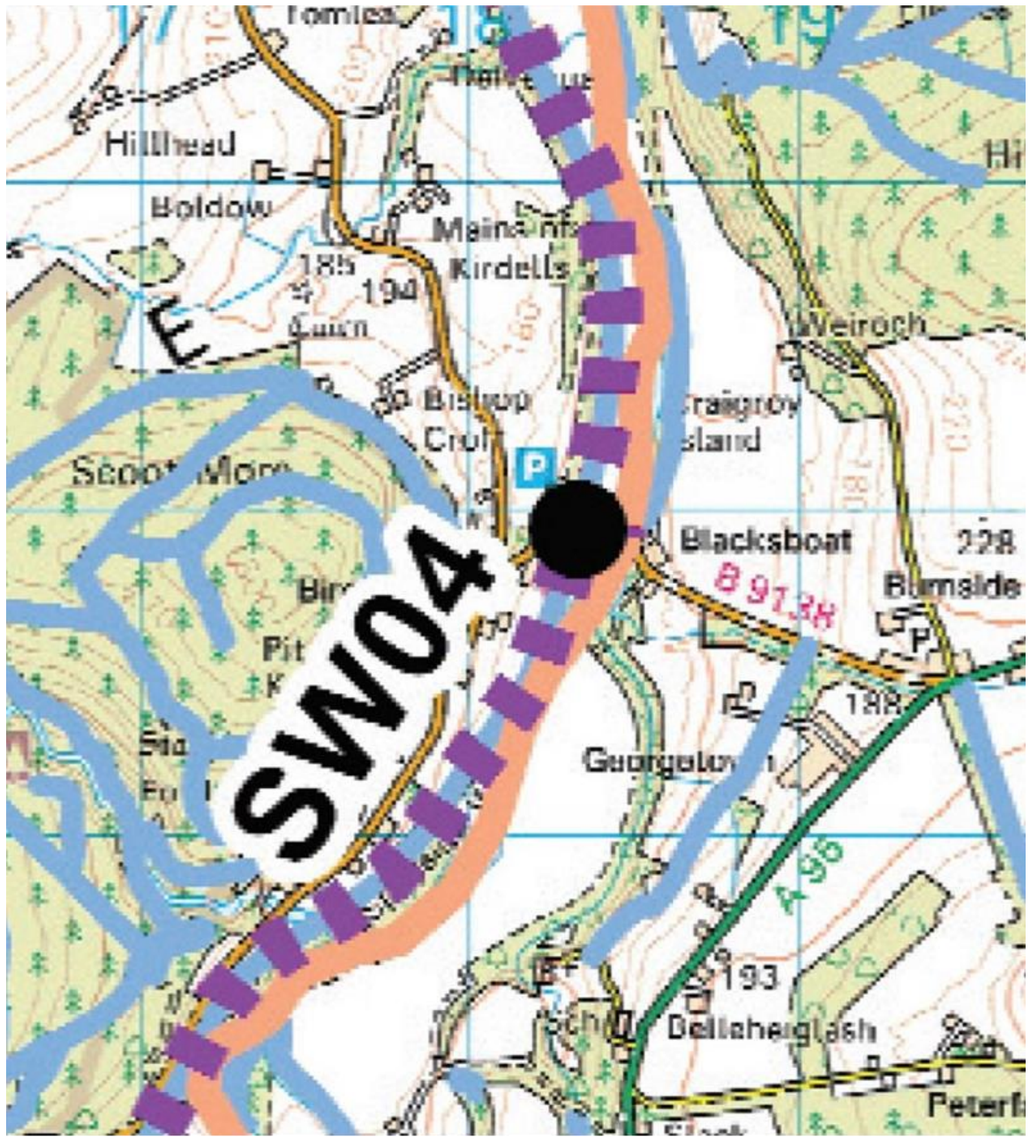
11.4.5 Atkins were contacted with turbine coordinates and dimensions on the 9th October 2017 and again on the 2nd December 2017. In their response, received on the 12th December 2017 (see Technical Appendix 11.1), they indicated that the proposal '*has now been examined in relation to UHF Radio Scanning Telemetry communications used by their Client in that region and that they have no objection to the proposal'.*

11.4.6 If there are any changes to turbine locations and turbine specifications, the aforementioned consultees will be informed of such changes.

11.4.7 In light of the above, it is considered that there will be no significant impacts with respect to microwave or radio communication networks.

11.5 PUBLIC RIGHTS OF WAY

11.5.1 Reference to OS mapping shows there are no known Public Rights of Way across the proposed development Area. The Moray Core Paths plan has also been consulted and show that there is one Core Path within the proposed development area. This is part of the Speyside Way (SW04), and it crossed the proposed development area along the access route in the vicinity of Blacksboat Bridge near Marypark (see Map Extract 11.1 below).



© Crown Copyright 2018. All rights reserved. Ordnance Survey Licence 0100031673.

Map extract 11.1 – Speyside Way in the vicinity of Blacksboat Bridge

11.5.2 For Health and Safety reasons, access across the proposed development area, including the main access route, would be managed during the construction phase. Any temporary restrictions on passage through the proposed development area would be appropriately sign posted and if necessary, temporary diversions put in place. The details of which would be agreed pre-construction with the local planning authority.

11.5.3 During the operational period, sign posts will be erected next to the access tracks to direct personnel to the relevant infrastructure onsite. This is for health and safety purposes to allow navigation across the site in the case of an emergency.

11.5.4 The core path itself should not be negatively impacted upon during construction but a temporary effect upon the use of this path during construction may be experienced. Because of the existing use and management of the access road which crosses the path, the additional impact of the proposed development during the construction phase is judged to be of **Low magnitude** impact with the path being of **High sensitivity**; the effect of which would be of **Moderate**. With appropriate mitigation it is considered that there will not be a significant impact upon this section of the Speyside Way. During the operational phase the additional impact of the proposed development is judged to be of **Negligible magnitude** impact with the path being of **High sensitivity**; the effect of which would be of **Low/moderate significance**, and therefore not significant in EIA terms (also see Chapter 6: Landscape and Visual Assessment, of the ES). Any effects would be temporary and any potential diversions will be managed and presented in the CMS post consent.

11.5.5 It is also noted that a Core Path exists to the West (The Dava Way) of the proposed development, however this is outwith the proposed development area and therefore would not be affected by the proposed development.

11.6 WATER SUPPLY

11.6.1 Scottish Water has confirmed in their scoping response (see Technical Appendix 1.2: Scottish Government Final Scoping Opinion in Volume 4 of the ES) that *'there do not appear to be any catchments within the site boundary or immediate vicinity of the proposed site for drinking water purposes. However, Scottish Water has abstractions from two sources; the Spey Boreholes and Ordiequish Collecting Chamber which are both surface water influenced. These sources are located near Fochabers, approximately 30km downstream of the site on the River Spey. As part of the EIA we would request an assessment to be undertaken to ensure that proposed activities do not impact on these sources'*. This is dealt with in Chapter 10 of the ES.

11.6.2 Scottish Water also requested that the developer should confirm the location of SW assets by obtaining detailed plans from our Asset Plan. This has now been undertaken and is also dealt with in Chapter 10 of the ES.

11.7 BURIED INFRASTRUCTURE AND OVERHEAD ELECTRICITY NETWORKS

11.7.1 A desk based review, using online tool "Linesearch before U dig"[1] of the proposed development area indicated that there is a gas pipeline within the vicinity of the wind turbines, albeit that the pipeline is not shown in the requested area of search. In the letter received from linesearch on the 13th October 2017, they indicated that the proposed development is within the operational buffer of the pipeline and therefore this is the reason why a letter was issued. Further investigations will therefore be carried out pre construction to ensure that all existing infrastructure is identified prior to construction start.

11.7.2 Cables and pipelines are also known to existing along the access route and grid connection route (Figure 1.3 in Volume 3, of the ES). It will therefore be essential to identify where these are prior to construction start and that safe working practices are undertaken in the vicinity of the pipelines.

11.7.3 'Linesearch before U dig' conveniently provides a single point of contact for all enquiries relating to the apparatus owned and/or operated by the Asset Owners protected by LinesearchbeforeUdig, including underground and overhead transmission/distribution electricity networks, transmission/distribution gas networks, oil pipelines, and fibre optic networks.

[1] Available online: http://www.linesearchbeforeudig.co.uk/# (last accessed 08/01/2018)

11.8 SUMMARY

11.8.1 In conclusion, the proposed development is likely to affect aviation interests and existing infrastructure. In terms of aviation interests, the wind turbines is likely to cause interference to both civil and military ATC radar located at Inverness Airport and RAF Lossiemouth respectively. In both cases, the applicant is in dialogue with the HIAL and the MoD to identify suitable mitigation solutions to reduce the impact to an acceptable level. Mitigation measures could be secured with appropriate planning conditions.

11.8.2 The proposed development will also cause interference to a communications link. An assessment identified that it is only T7 that could potentially interfere with the link, and mitigation is possible. Potential mitigation measures include agreeing to a micro-siting restriction ensuring that the turbine position does not move closer to the link or upgrade of the antenna (if the former is not possible). Refer to the note from JRC for confirmation of the requirements of the link owner (see Technical Appendix 11.1). The mitigation could be secured through a planning condition.

11.8.3 In relation to existing infrastructure, it has been identified that there is existing infrastructure in the vicinity of the wind farm, access route and grid connection route. Suitable embedded mitigation will be taken to ensure that these assets are suitably protected throughout the delivery, construction and operation of the wind farm. Where mitigation is required detail will be provided in the CMS.

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Chapter 12

Traffic and Transport Assessment

Contents

Glossary

Term	Definition
Environmental Impact Assessment	Environmental Impact Assessment (EIA) is a means of drawing together, in a systematic way, an assessment of the likely significant environmental affects arising from a proposed development
Environmental Statement	A document reporting the findings of the EIA and produced in accordance with the EIA Regulations
The Existing Paul's Hill Wind Farm	The 'existing Paul's Hill Wind Farm' refers to the operational Paul's Hill Wind Farm.
The Proposed Development	The proposed Paul's Hill II Wind Farm
The Proposed Development Area	Red line boundary (application area)

List of Abbreviations

Abbreviation	Description
ATC	Automated Traffic Counts
AIL	Abnormal Indivisible Loads
HGV	Heavy Goods Vehicle
LGV	Light Goods Vehicle

12.1 INTRODUCTION

12.1.1 This chapter assesses the impacts due to transport and access for the proposed Paul's Hill II Wind Farm development resulting from the wind farm construction, operation and decommissioning of the development against a baseline condition built up from Automated Traffic Counts (ATCs) commissioned for this project and Department for Transport data of traffic flows on the roads network. This assessment was carried out by Natural Power.

12.1.2 Traffic generated by the wind farm proposal would be concentrated during the construction phase and decommissioning phases of the wind farm. During the operation of the wind farm, traffic would be minimal since much of the operation of the wind farm would be automatic and would be monitored as part of the wider management of the existing wind farm at Paul's Hill.

12.1.3 Construction traffic required to deliver the wind farm falls into three broad categories namely Abnormal Indivisible Loads (AIL), Heavy Goods Vehicles (HGV) and Light Goods Vehicles (LGV).

12.1.4 The construction of Paul's Hill II Wind Farm is expected to last approximately 12 months, from site mobilisation through to installation and commissioning of the turbines, ending with site re-instatement and demobilisation.

12.1.5 Turbine components, electrical equipment, concrete, steel for turbine foundations and electrical cabling would all need to be transported to the site using the public road system. It is envisaged that traffic on public roads during the construction period would be minimised as far as possible through the use of borrow pits located within the site for material for the access track and site track construction. Should further borrow pits be required these would be subject to an appropriate Mineral License application. Refer to Chapter 4 Description of Development for further detail on the construction methods.

12.2 APPROACH TO ASSESSMENT

12.2.1 The general approach to the assessment of effects outlined in Section 5 and required by The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000 has been followed (see 5.1.3 re. 2017 EIA regulations).

12.2.2 Baseline conditions have been established through consultation with Moray Council and use of available traffic survey data. Potential effects have been identified and assessed, and where relevant, mitigation measures identified.

12.2.3 The significance of potential effects has been assessed in light of recognised thresholds of significance from published guidance, as discussed below.

Guidance

12.2.4 The transport and traffic issues described in the following planning advice and guidance documents have been taken into account in this assessment:

- Scottish Planning Policy (SPP) (2014); The Scottish Government
- Planning Advice Note (PAN) 75: Transport and Planning (2005); The Scottish Government
- Transport Assessment and Implementation: A Guide (2005); The Scottish Government
- Guidelines for the Environmental Assessment of Road Traffic (1993), Institute of Environmental Management & Assessment (IEMA).
- Guidelines for Traffic Impact Assessment of Road Traffic (1994); Institute of Highways and Transportation (IHT).

12.2.5 Paragraph 169 of SPP notes that:

'Proposals for energy infrastructure developments should always take account of spatial frameworks for wind farms and heat maps where these are relevant. Considerations will vary relative to the scale of the proposal and area characteristics but are likely to include (amongst other elements)*:*

• impacts on road traffic;

• impacts on adjacent trunk roads;

• cumulative impacts – planning authorities should be clear about likely cumulative impacts arising from all of the considerations below, recognising that in some areas the cumulative impact of existing and consented energy development may limit the capacity for further development.'

12.2.6 Paragraph 41 of PAN75 notes that:

'All planning applications that involve the generation of person trips should provide information which covers the transport implications of the development. The level of detail will be proportionate to the complexity and scale of impact of the proposal. This will provide an indication of whether a transport assessment should be carried out. As a change of use could result in different travel characteristics a transport assessment should be requested where the change is likely to result in a material change in trips. For smaller developments the information on transport implications will enable local authorities to monitor potential cumulative impact and for larger developments it will form part of a scoping exercise for a full transport assessment. Development applications will therefore be assessed by relevant parties at levels of detail corresponding to their potential impact.'

12.2.7 The Transport Assessment and Implementation: A Guide (2005) states in Paragraph 9.12:

'A Transport Assessment will be required where the development or redevelopment is likely to have significant transport implications, no matter the size. The coverage and detail of the Transport Assessment should reflect the scale and the likely extent of transport impacts of the proposed scheme. The planning authority and developer and, in the case of developments that affect trunk roads, TRNMD and their operators should discuss the content and level of detail of the Transport Assessment required as part of the planning application.'

'More detail may be required for those developments that meet or exceed any of the following criteria:

12.2.8 The size thresholds set out in SPP paragraph 17 for Maximum Parking Standards and described below:

- *residential development of 100 units or more;*
- *100 or more vehicle movements per day;*
- *10 freight movements per day; or*
- *When the planning authority has significant concerns about the possible transport impact of the proposed development.'*

12.2.9 Appendix A of the Guide states:

'Transport Assessments must identify both the volume and distribution of vehicle trips related to the development and set this within the context of existing traffic movements in the locality.'

12.2.10 Much of the above guidance deals principally with developments that generate significant increases in travel as a direct consequence of their function, e.g. retail parks. As mentioned above, the traffic generated by the wind farm proposal would almost entirely be limited to vehicle movements relating to the construction phase and decommissioning phases of the wind farm. However, in providing the information required in an Environmental Statement, this section addresses the local short term transport impacts of the development during construction and therefore addresses the issues that would be assessed within a formal transport assessment.

Consultation

12.2.11 The scoping opinion received from Moray Council (in Appendix 1.2) outlined the requirements for assessment of transport, traffic and roads. The following comments were made:

'*The traffic and transport chapter should be supported by a Construction Method Statement and Construction Traffic Management Plan focussing on the delivery of abnormal roads and the impact of HGV construction traffic on the local roads network.'*

12.2.12 It has subsequently been agreed between Moray Council and Natural Power that the Construction Method Statement and the Construction Traffic Management Plan will be provided pre-construction. This will follow a main contractor and a turbine supplier being selected for the proposed development and will be submitted to the local authority, Moray Council, for approval.

12.2.13 The scoping opinion received from Transport Scotland (in Appendix 1.2) outlined the requirement for an abnormal loads assessment should the A9(T) and A95(T) form part of the turbine delivery route. They specify that road links should be taken forward for assessment where Institute of Environmental Management and Assessment (IEMA) Guidelines for further assessment are breached.

Methodology

12.2.14 The potential increase in traffic numbers has been calculated by comparing predicted vehicle numbers with existing traffic numbers on the public roads used to access the site. The increases have been expressed as percentages, and their significance assessed in terms of recognised criteria detailed below.

12.2.15 The assessment proceeds via the following steps:

a. Screening;
b. Assess magnitude of effects;
c. Assess the sensitivity of the receptors;
d. Combine magnitude of effect and sensitivity of receptor into a single significance of effect;
e. If significance is elevated, review opportunities to mitigate the effects.

12.2.16 Each vehicle travelling to the site will generate two "vehicle movements"; one movement to the proposed wind farm and one movement away from the wind farm i.e.

1 delivery to the wind farm = 2 vehicle movements

Screening Test

12.2.17 The Institute of Environmental Management & Assessment (IEMA) Guidelines suggest that two broad rules of thumb can be used as a screening process to delimit the scale and extent of the assessment. These are:

- Rule 1 - Include highway links where traffic flows would increase by more than 30% (or the number of HGVs would increase by more than 30%)
- Rule 2 - Include any other specifically sensitive areas where traffic flows would increase by 10% or more. (IEA Guidelines Paragraph 3.20 defines sensitive area as including *"accident blackspots, conservation areas, hospitals, links with pedestrian flows etc."*)

12.2.18 Where the predicted increase in traffic flow is lower than these thresholds further detailed assessments are not warranted.

12.2.19 These guidelines are intended to be used for the assessment of the environmental impact of road traffic associated with major new developments. The assessment is therefore more pertinent to the operational phase of the wind farm than the construction phase. However, they are used here to assess the short term transport flow during construction.

12.2.20 The matrix shown in Table below has been used for the screening test for the traffic assessment.

Table 12.1: Significance criteria

Rule 1	Rule 2	Further assessment required
Yes	Yes	Yes
Yes	No	Yes
No	Yes	Yes
No	No	No

Magnitude of Effect

12.2.21 The magnitude of traffic effects is a function of the existing traffic volumes, the percentage increase due to the proposals, the changes in type and the temporal distribution of traffic. The criteria for the magnitude of effects due to the increase in traffic volumes are outlined in Table 12.2.

Table 12.2: Definitions of magnitude of effect criteria

Magnitude	Description of change	Percentage traffic increase
High	Total loss or major alteration to key elements/features of the baseline conditions	>90%
Medium	Partial loss or alteration to one or more key elements/features or the baseline conditions	60-90%
Low	Minor shift away from baseline conditions	30-60%
Negligible	Very slight change from baseline conditions	<30%

Assessment of Sensitivity

12.2.22 When judging upon the sensitivity of the road to the proposed temporary increase in traffic movements associated with the wind farm construction, a variety of considerations were taken in account including classification of the road, proximity of schools, housing and local amenities and existing traffic management (e.g. roundabouts, passing places etc.).

12.2.23 The sensitivity of the roads used for this project have been assessed in accordance with the IEMA Guidelines and although not providing specific criteria for evaluating sensitivity, for the purpose of this assessment, a scale of 'low', 'medium' and 'high' has been used (see Table 12.3 below).

12.2.24 The assessment has considered three categories of receptors, which consist of:

- Public road networks and road users;
- Local settlements along the proposed access route(s); and
- Road structure.

12.2.25 The effects on the proposed route and surrounding communities have been assessed with regards to severance, driver and pedestrian delay, safety, pedestrian amenity and fear and intimidation, in line with the IEMA Guidelines. The effects of factors such as noise and ecological impact are assessed in Chapter 13: Human Health and Population and Chapter 7: Ecology, of the ES respectively.

12.2.26 The categories of receptor and assessment criteria are shown in table 12.3 below:

Table 12.3: Receptor Grouping and Sensitivity Criteria

Receptor	Low	Medium	High
Public road networks and road users	Major highways with no junctions, such as motorways, or a road network with suitable capacity to absorb an increase in traffic.	Road networks with some capacity to absorb an increase in traffic.	Road network with little or no capacity to absorb an increase in traffic.
Local settlements	Local settlements with no requirement for direct pedestrian access to the road.	Local settlements with adequate pedestrian provisions.	Local settlements with narrow or no pedestrian provisions, near to sensitive locations such as hospitals, retirement homes, schools, places of worship, public open spaces and tourist attractions.
Road structure	Major highways or roads with no obvious physical defects.	Regional highways or roads with some minor physical defects.	Local roads with some physical defects or local roads, infrequently maintained with re-occurring physical defects.

Assessment of Significance

12.2.27 The magnitude and sensitivity can be combined to determine the level of significance of the effect. Further details are given in Section 5 of this Environmental Statement (ES) and are described in Table .

Table 12.4: Significance matrix

	SENSITIVITY		
MAGNITUDE	**High**	**Medium**	**Low**
High	Major	Major / Moderate	Moderate
Medium	Major / Moderate	Moderate	Low / Moderate
Low	Moderate	Low / Moderate	Low
Negligible	Low / Moderate	Low	Negligible / Low

Note: Only **Major** and **Major / Moderate** significance are considered significant in terms of the EIA Regulations.

12.3 DESCRIPTION OF ROUTE TO SITE

12.3.1 The preferred route for the major component deliveries is as follows:

- Turn left out of Invergordon Port and travel west along B817;
- Turn left onto the A9 and continue south to Inverness;
- A96 east from Inverness to Elgin;
- A941 through Elgin then south to Craigellachie;
- A95 west to junction with B9138 at Marypark;
- B9138 west and over Blacksboat Bridge;
- B9102 north towards site entrance.

12.3.2 Material deliveries from the north would also take this route. Material deliveries from the east would travel west along the A95 and join the route at Craigellachie. Material deliveries from the south would travel north along the A9 to Aviemore, then take the A95 towards the Marypark junction.

12.3.3 Imported stone for turbine foundations would use the identified/selected route.

12.3.4 Workforce coming from the north is expected to travel on the C13e or B9102 while workforce from the south is expected to travel along the A95 towards the Marypark junction then join the identified route.

12.3.5 Further information on traffic management will be provided pre-construction in a Construction Traffic Management Plan.

12.4 BASELINE CONDITIONS

Road Description

12.4.1 The A9 from the Invergordon junction to Inverness is part of the trunk road network North West Unit and is under the control of BEAR Scotland. It is the main route for access to Scotland north of Inverness. The majority of it is single lane featuring a number of roundabouts with bridge crossings of the Cromarty Firth and Beauly Firth via the Cromarty Bridge and Kessock Bridge respectively. The approach to the Kessock Bridge is dual carriageway as well as the section passing through Inverness.

12.4.2 The A96 from Inverness to Elgin is part of the trunk road network North East Unit and is under the control of BEAR Scotland. It is the main route for access east from Inverness. The majority of it is single lane apart from dual carriageway on the approach to Inverness. The route features a number of roundabouts.

12.4.3 The A941 from Elgin to Craigellachie is a Primary Route and is maintained by Moray Council. It is the main route for access south from Elgin. The majority of it is single lane apart from crawler lanes near to Craigellachie.

12.4.4 The A95 from Aviemore to Craigellachie is part of the trunk road network North East Unit and is under the control of BEAR Scotland. The majority of it is single lane with the exception of a number of crawler lanes.

12.4.5 The B9138 which connects the A95 and B9102 is maintained by Moray Council. This is single lane and crosses the River Spey via Blacksboat Bridge. Two further bridge structures are located in this valley with one to cross the disused railway line and the other to cross the former flood channel, named Flood Channel Bridge.

12.4.6 The B9102 continues north to the site entrance is also maintained by Moray Council. It has on it the Bridge of Cally, approximately 600m north of the proposed site entrance.

12.4.7 The C13e joins the B9102 at Upper Knockando and is similarly maintained by Moray Council.

Baseline Traffic Data

Minor roads near site

12.4.8 Data for the baseline traffic counts on the B9138, B9012 and C13e minor roads were taken from a manual traffic survey conducted by Traffic Data Collection over a 2 week period between 24th October 2017 and 6th November 2017. The three count locations considered are shown in Appendix 12.1 - Drawing 10510_100_300 "Traffic Count Locations" and the raw data in Appendix 12.2 located in Volume 4 of this ES.

Table 12.5 Two-way Average Daily Traffic Flows for 12hours (0700 – 1900) for 24th October to 6th November 2017

Location	Location Description	12hr Flow (Total Traffic)	12hr Flow (HGV Traffic)
A	B9138 West of Marypark	248	35
B	B9102 South of Site Entrance	311	61
C	C13e North of Upper Knockando	187	21

12.4.9 The traffic data was converted using the methodology set out in DMRB[1].

Table 12.6 Average Annual Daily Traffic Flows for Minor Roads, 2017

Location	Location Description	Average Annual Daily Traffic (Total Traffic)	Average Annual Daily Traffic (HGV Traffic)
A	B9138 West of Marypark	287	40
B	B9102 South of Site Entrance	360	70
C	C13e North of Upper Knockando	216	24

[1] Volume 15, Section 1 and Part 5 of the Design Manual for Roads and Bridges (DMRB)

Trunk and Primary Route roads

12.4.10 Data for traffic baseline for the A95 and A941 Trunk and Primary Routes near site were taken from the Department for Transport website. The four locations considered are shown in Appendix 12.1 - Drawing 10510_100_300 "Traffic Count Locations" and the raw data in Appendix 12.3. Data from 2015 has been used as this is the most recent year that had complete data at every location.

Table 12.7 Average Annual Daily Traffic Flows for Trunk and Primary Routes near site, 2015

Location	Location Description	Average Annual Daily Traffic (Total Traffic)	Average Annual Daily Traffic (HGV Traffic)
1055	A95 West of Aberlour	3277	469
74436	A95 North of Craigellachie	6986	685
20985	A941 North of Craigellachie	6208	685
30867	A95 West of Bridge of Avon	2740	409

12.5 TRAFFIC GROWTH

Calculated Traffic Growth

12.5.1 The traffic figures detailed in Table 12.5, 12.6 and Table 12.7 do not account for the annual rise in baseline conditions and so we have adjusted to accurately reflect the increase in baseline traffic during construction of the wind farm, predicted for 2020. Traffic growth has been calculated by applying National Road Traffic Forecast (NRTF) growth factors. The Low growth factor has been assumed for HGV traffic as this will give a worst case prediction while the Central growth factor has been assumed for all traffic.

Table 12.8 NRTF Growth Factors

Growth Period	Central Growth – for Total Traffic	Low Growth – for HGV
2012 to 2016	1.572	1.350
2017 to 2021	1.484	1.290

Table 12.9 Calculated traffic for construction year, 2020

Location	Description of location	Type of road	Annual Average Daily Traffic (Total Traffic)	Annual Average Daily Traffic (HGV Traffic)
A	B9138 West of Marypark	Minor	300	42
B	B9102 South of Site Entrance	Minor	377	73
C	C13e North of Upper Knockando	Minor	226	25
1055	A95 West of Aberlour	Trunk	3277	469
74436	A95 North of Craigellachie	Trunk	6986	685
20985	A941 North of Craigellachie	Primary Route	6208	685
30867	A95 West of Bridge of Avon	Trunk	2740	409

Traffic Movements

Construction Period

12.5.2 A programme of construction activities has been included in Section 4 of the ES.

12.5.3 Vehicles and equipment would be delivered to site at the commencement of the relevant construction phase and would remain on site until work relating to that stage was completed. Such equipment would include cranes for erecting the turbines and excavators for cable installation and foundation excavation. An indicative list of the equipment needed is given in Section 4 of the ES.

12.5.4 Most vehicles used during the construction activities would be below the width requirement for wide loads, with the exception of the turbine deliveries (nacelle, tower sections and blades) and possibly the 800/1000 tonne and three 400/500 (or less) tonne cranes that would be used for the erection of the turbines. The Applicant will liaise with Transport Scotland and the local constabulary regarding a potential police escort for some abnormal loads, depending on conditions on the A95, A941 and minor local roads and the size of the loads. This will be addressed in the TMP and secured through an appropriate planning condition. The cranes are likely to require only a single journey along the public highway to and from the development. Road axle weights would not exceed regulated levels unless agreed with the relevant authorities.

12.5.5 Indicative HGV traffic loads for the various phases of the construction operations are as follows:

- **Site Tracks, Construction Compound, Crane Pads and Borrow pits (Earthworks):** It is envisaged that the road stone for the site tracks and construction compound would come from borrow pits on-site (providing that the stone is deemed suitable for this purpose). Dump trucks would be used on site for transporting stone around and would be delivered to the site where they would remain until the end of the relevant construction period. Up to 4 dump truck deliveries would therefore be required. It is anticipated that up to 5 excavators could be on-site for the following purposes: excavating stone; excavating for tracks; placing of stone for tracks and crane pads; excavating foundation; back filling foundations; and reinstatement works. Site won material will be recycled as much as is possible with excess material used for borrow pit restoration, for example.
- **Turbine and Transformer Foundations:** Based upon the typical foundation design, and assuming in worst case concrete is not batched on-site, approximately 747 concrete wagon deliveries would be required for all turbines. Each turbine foundation would also require two/three articulated trailer loads of steel rod reinforcements giving a total of up to 35 additional deliveries.
- **Substation:** A new substation with concrete base, block walls and pitched roof in the style of the existing building will be built requiring 20 vehicle movements.
- **Turbine Delivery and Erection:** For the size of turbines being considered for the site, blades would likely be transported one per trailer load and towers would be delivered in up to three separately transported sections. Nacelles and hubs would likely be delivered one per trailer. Between one and two curtain trailers for items that would be fitted within the turbines would also be required. Together these movements could constitute up to 77 deliveries to the site (154 movements). Some 7 further low loader deliveries would be required for the transformers and ancillary electrical equipment (14 movements). Crane delivery would require up to approximately 90 movements to site. The larger 800/1000 tonne crane would require approximately 10 vehicles for delivery (a total of 20 movements), and the three smaller 400/500 tonne cranes up to 5 vehicles each for delivery (a total of 30 movements). One erection team would be likely to be operating at any one time.
- **Cable Installation:** Approximately 195 low loader deliveries (390 movements) would be needed to transport the necessary cabling to site for on-site cabling requirements.
- **Transport of site personnel:** Approximately 10-20 car/van journeys per day would be required for the relevant personnel employed in the construction of the wind farm and any small deliveries.

Operational Period

12.5.6 Limited traffic movements would be necessary on an irregular basis throughout the operational life of the wind farm which would consist almost entirely of cars or vans servicing the turbines, with the exception of infrequent major maintenance events that may require mobilisation of crane(s) and possible turbine component deliveries. This level of maintenance already occurs at the existing operational site, the inclusion of 7 more turbines will not increase the movements to a noticeable number of extra movements.

Decommissioning

12.5.7 All turbine components would be removed from the site and potentially the upper levels of the foundations. Traffic movements would therefore comprise the same unusual loads as for the construction period but less ordinary HGV movements since much of the foundation would be likely to remain in the ground. The method of decommissioning would be agreed with the relevant planning authority as outlined in Section 5 of this ES.

12.6 IMPACT OF TRAFFIC MOVEMENTS

12.6.1 The traffic movements to and from the wind farm have been detailed in Table 12.10.

12.6.2 The increase in traffic movements that would be generated by the proposed wind farm have been assessed against the traffic flow figures for roads closest to the site, namely the A95 and A941 near to the Marypark junction and the minor roads near to the site junction including the B9138, the B9102 and the unclassified road north of Upper Knockando (the C13e).

12.6.3 The construction of the proposed wind farm is estimated to lead to around 2122 deliveries by HGVs and 2273 light personnel and delivery vehicles over the proposed 12 month period (see Table 12-10). An over simplified way of assessing the increased traffic would be to divide the total number of vehicle movements by the number of

construction months, but as Figure 12.1 shows, the average daily flow of traffic generated by the construction would vary over the suggested time period therefore the distribution of traffic has been calculated in relation to the proposed construction programme taking account of the division of different construction activities.

12.6.4 Consultation with Moray Council indicated that they would seek to restrict HGV movements to site from the north along the B9102 due to significant issues with construction traffic using the Bridge of Cally for construction of the original Paul's Hill. This assessment therefore assumes that no HGVs will utilise the B9102 north of the site junction nor the C13e north of Upper Knockando.

12.6.5 The assessment assumes that 100% of HGV traffic accesses the Marypark junction from both the north and the south, therefore the traffic assessment is an over estimate.

12.6.6 The assessment assumes that 100% of remaining traffic approaches the site entrance junction from both the north and the south, therefore the traffic assessment is an over estimate.

12.6.7 Average Daily Movements have been calculated assuming a five day working week.

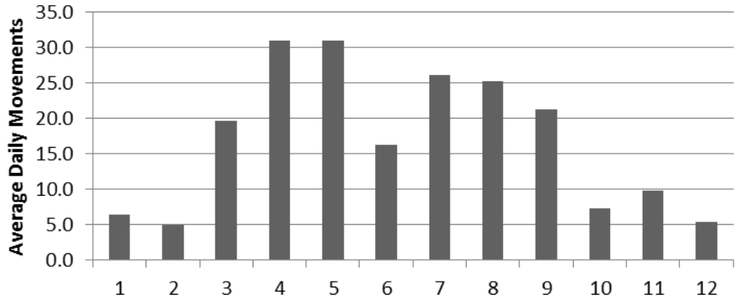

Figure 12.1 Average daily vehicle movements over a typical 12 month construction period

Table 12.10 Predicted vehicle movements during the construction period

Activity	Month												
	1	2	3	4	5	6	7	8	9	10	11	12	Total
Heavy Goods Vehicles Movements (including abnormal loads)													
Felling - Export of timber	No felling is required.												
Mobilisation to site	32												20
Access and site tracks	Stone sourced from onsite borrow pits will be utilised for tracks and crane hardstandings.												
Crane Hard-Standing													
Turbine foundations				250	250	250	250	250	250				1500
Substation								20					20
Cabling								196	196				392
Turbine transformers										14			14
Turbine deliveries										97	52	97	244
Demob / Site clearance											10	10	20
Monthly Totals	**32**	**0**	**0**	**250**	**250**	**250**	**466**	**446**	**361**	**52**	**107**	**10**	**2212**
Light Vehicle Movements (car, minibuses and small van deliveries)													
	108	108	433	433	433	108	108	108	108	108	108	108	2273
Monthly Totals	**140**	**108**	**433**	**683**	**683**	**358**	**574**	**554**	**469**	**160**	**215**	**118**	**4485**
Average Daily Movements	6.4	4.9	19.7	31.0	31.0	16.3	26.1	25.2	21.3	7.3	9.8	5.4	
Average Daily HGV Movements	1.5	0.0	0.0	11.4	11.4	11.4	21.2	20.3	16.4	2.4	4.9	0.5	

Impact on A95 and A941 Trunk and Primary Routes during Construction

12.6.8 Table 12.11 shows the increase in traffic when using the calculated traffic for 2020 and the estimated daily traffic flow for the proposed wind farm, using the busiest months of construction (months 4 and 5 for all movements, and month 7 for HGVs).

Table 12.11 Estimated daily traffic increases, for the busiest construction month.

Location	Calculated Total Traffic flow (2020)	Estimated Total Traffic Increase	Increased Total Traffic Flow	% Total increase	Calculated HGV Flow (2020)	Estimated HGV Increase	Increased HGV Flow	% HGV increase
1055	3277	31	3308	0.9%	469	22	490	4.7%
74436	6986	31	7017	0.4%	685	22	706	3.2%
20985	6208	31	6239	0.5%	685	22	706	3.2%
30867	2740	31	2771	1.1%	409	22	430	5.4%

12.6.9 Assessing against the criteria in Table 12.1 (Method 1) for Locations 1055, 74436, 20985 and 30867, neither Rule 1 nor Rule 2 are breached as the increase in HGV traffic is less than 30% and the overall traffic increase is less than 10%. Accordingly, further assessment is not required. However, the locations are assessed further below for completeness.

12.6.10 Referring to Table (Method 2), the magnitude of effect of the traffic flow increase on the A95 and A941 is considered to be **Negligible**.

12.6.11 Due to the relatively high proportion of traffic of all types already present on the A95 and A941, the A95 and A941 are considered to have suitable capacity to absorb an increase in traffic therefore are assessed to be of **Low** sensitivity with respect to further increases in traffic movements.

12.6.12 Therefore, using the significance matrix (as described in Table), the combination of **Negligible** magnitude of impact and **Low** sensitivity leads to a significance of **Negligible / Low** which is considered to be **'Not Significant'** with respect to the terms of the EIA regulations.

12.6.13

Table 12.12 Summary of significance

Location	Significance Criteria (Method 1)	Magnitude of Effect (Method 2)	Sensitivity	Significance	Significance (EIA Regulations)
1055	Low	Negligible	Low	Negligible / Low	Not Significant
74436	Low	Negligible	Low	Negligible / Low	Not Significant
20985	Low	Negligible	Low	Negligible / Low	Not Significant
30867	Low	Negligible	Low	Negligible / Low	Not Significant

Impact on Minor Roads near site during Construction

12.6.14 Table 12.13 shows the increase in traffic when using the calculated traffic for 2020 and the estimated daily traffic flow for the proposed wind farm, using the busiest months of construction (months 4 and 5 for all movements, and month 7 for HGVs).

Table 12.13 Estimated daily traffic increases, for the busiest construction month.

Location	Calculated Total Traffic flow (2020)	Estimated Total Traffic Increase	Increased Total Traffic Flow	% Total increase	Calculated HGV Flow (2020)	Estimated HGV Increase	Increased HGV Flow	% HGV increase
A	300	31	331	10.3 %	42	22	63	52.5%
B	377	31	408	8.2%	73	22	94	30.1%
C	226	20	257	8.8%	25	0	25	0%

12.6.15 Assessing against the criteria in Table 12.1 above for Location A both Rule 1 and Rule 2 are breached as the increase in HGV traffic is more than 30% and the overall traffic increase is 10% or more, therefore further assessment is required. For Location B Rule 1 is breached as the increase is HGV traffic is 30% or more but Rule 2 is not breached as the overall traffic increase is less than 10%, therefore further assessment is required. For Location C Rule 1 is not breached as the increase in HGV traffic is less than 30% but Rule 2 is breached as the overall traffic increase is more than 10%, therefore further assessment is required. This further assessment is provided below.

Magnitude of Effect on Minor Roads

12.6.16 Taking the worst case increase (in this case HGV traffic) and referring to Table (Method 2), the magnitude of the effect of the traffic flow increase on the minor road at Location A is considered to be **Low**.

12.6.17 Taking the worst case increase (in this case HGV traffic) and referring to Table 12.2 (Method 2), the magnitude of the effect of the traffic flow increase on the minor road at Location B is considered to be **Low**.

12.6.18 Taking the worst case increase (in this case all traffic) and referring to Table 12.2 (Method 2), the magnitude of the effect of the traffic flow increase on the minor road at Location C is considered to be **Negligible**.

Sensitivity of Minor Roads

12.6.19 The sensitivity of the minor road locations has been assessed with regards to proximity to populated areas and the level of use by pedestrians and cyclists through observation of foot and cycle paths using criteria set out in Table 12-3. The sensitivity assessment is summarised in Table 12.14.

12.6.20 Location A, which represents the B9138, is assessed as having **High** sensitivity due to the presence of a number of houses lining the road at Marypark and Blacksboat with narrow or no pedestrian provision. In addition the disused railway that follows the west bank of the River Spey and is part of the Speyside Way (a national tourist route used by pedestrians, cyclists and horse riders) passes under the B9138.

12.6.21 Location B is assessed as having **Low** sensitivity due to the small number of isolated houses that are accessed from this road. These houses are assessed as having no requirement for direct pedestrian access to the road as there are no local amenities, therefore it is assumed residents will drive to other settlements. In addition the road is not crossed nor lined by foot and cycle paths and has no obvious physical defects.

12.6.22 Location C is assessed as having **Medium** sensitivity due to the presence of the houses forming the settlement of Upper Knockando which has adequate pedestrian provisions.

Table 12.14 Sensitivity of locations on Minor roads

Location	Description of location	Sensitivity	Reason
A	B9138 West of Marypark	High	Houses at Marypark; Proximity to pedestrian path and Speyside Way
B	B9102 South of Site Entrance	Low	Few houses
C	C13e North of Upper Knockando	Medium	Houses at Upper Knockando

Impact Significance on Minor roads

12.6.23 For Location A and using the matrix in Table 12.4 for a **Low** magnitude of effect on a receiving element of **High** sensitivity results in a significance of **Moderate,** which is considered to be **'Not Significant'** with respect to the terms of the EIA regulations.

12.6.24 For Location B and using the matrix in Table 12.4 for a **Low** magnitude of effect on a receiving element of **Low** sensitivity results in a significance of **Low** which is considered to be **'Not Significant'** with respect to the terms of the EIA regulations.

12.6.25 For Location C and using the matrix in Table 12.4 for a **Negligible** magnitude of effect on a receiving element of **Medium** sensitivity results in a significance of **Low** which is considered to be **'Not Significant'** with respect to the terms of the EIA regulations.

Table 12.15 Summary of significance

Location	Significance Criteria (Method 1)	Magnitude of Effect (Method 2)	Sensitivity	Significance	Significance (EIA Regulations)
A	High	Low	High	Moderate	Not Significant
B	High	Low	Low	Low	Not Significant
C	High	Negligible	Medium	Low	Not Significant

Impacts during Operation

12.6.26 Through the operational life of the wind farm there would be irregular and limited traffic movements consisting almost entirely of cars or vans that would be required for the service and maintenance of the site. The number of vehicle movements during operation is infrequent and of a very low number such that the magnitude of their impact is considered to be negligible, leading to **Negligible Significance**, when assessed using the significance criteria, and due to the existence of the operational Paul's Hill site this could further reduce the number of vehicles required during operation of Paul's Hill II. The wind farm operators, Fred.Olsen Renewables Ltd. will be aware of any local road sensitivities. During any major repair works required cranes and HGV vehicles may need to visit site. Due to the low number of vehicle required this would still be considered to be of **Negligible Significance**.

Impacts during Decommissioning

12.6.27 The HGV traffic intensity using the public roads during the decommissioning period is likely to be similar to that of the construction period, with all turbine components including blades, nacelles and towers being removed from the site. Since it is likely that the bulk of the foundations would be left in situ, with only the upper parts being removed from the site, the ordinary HGV traffic to and from the site is likely to be less than during the construction period. The decommissioning would be likely to take place over a similar time period to the construction stage. Baseline traffic flows on all of the affected roads may have altered by the end of the 35 year lifetime of the wind farm leading to the possibility of a different impact on the roads for HGV traffic. It is envisaged that the decommissioning would result in lesser impacts than those identified for the construction period. Decommissioning would be managed in accordance to a decommissioning plan to be agreed with relevant parties at the time.

12.7 DISCUSSION AND MITIGATION

Potential Environmental Impacts of Construction Traffic

12.7.1 The IEMA guidelines identify the following potential environmental effects:

- Noise
- Vibration
- Visual impact
- Severance
- Driver Delay
- Pedestrian Delay
- Pedestrian Amenity
- Accidents and Safety
- Hazardous Loads
- Air Pollution
- Dust and Dirt
- Ecological Impact
- Heritage and Conservation Areas

12.7.2 Of these, noise, vibration and dust and dirt are considered to be the most applicable to the proposed wind farm development, as these are most likely to affect local residents. In addition, the increased traffic on the road network may result in traffic impacts such as driver delay and potential accidents. Embedded mitigation measures for these effects are included below. Potential noise impacts are considered in Chapter 13: Human Health and Population.

12.7.3 The increased number of heavy goods vehicles also has the potential to cause some localised air pollution, due to exhaust emissions. However, any effects would be temporary in nature, as any emissions would naturally disperse quickly as the route is rural and in places exposed. Carbon dioxide emissions generated would be quickly offset by the reduction in carbon dioxide emissions resulting from the operation of the wind farm (refer to Appendix 10.5 Carbon Balance Assessment within this ES). Embedded mitigation measures intended to minimise these effects as far as possible are included below.

12.7.4 The increased number of heavy goods vehicles also has the potential to create increased siltation of watercourses due to muddy vehicles. A wheel wash facility will assist in keeping the level of siltation to an acceptable level. The implementation of good practice measures and embedded mitigation covered in Chapter 10: Hydrology, Geology and Hydrogeology will ensure that impacts on watercourses and the hydrological environment are kept to a minimum.

Embedded Mitigation

12.7.5 Although we are not showing significant impacts during construction it is important to keep the local residents and people visiting the area informed of potential traffic issues that may delay or otherwise affect their journey. Typically, the slower turbine delivery vehicles would have the largest effect on other road users. Therefore, the following measures will be taken to ensure that local residents and visitors are informed in advance of potential traffic issues associated with the proposed wind farm. These measures will be incorporated into the TMP and secured through an appropriate planning condition.

- HGV deliveries including concrete and turbine components would be instructed to avoid school drop off and pick up times.
- During turbine delivery phase, leaflets would be posted in local shops and other public places and distributed to houses along the delivery route.
- Identify stopping points along the transport route where slower turbine delivery vehicles can pull over to allow queued traffic to pass.
- Arrange for adequate wheel washing facilities, to allow construction vehicles to clean their wheels before entering onto the public road.
- Arrange road cleaning vehicle to keep the public road free of mud.

- To reduce air pollution, make sure that all construction vehicles are adequately maintained to comply with exhaust emission requirements and are switched off when not in use. Encourage the use of minibuses and car-sharing for personnel transport.
- To reduce noise and vibration disturbance, arrange the transport of heavy loads at times of least sensitivity e.g. not in the evening, or night time deliveries through residential areas.
- To reduce risk to pedestrians and road users, abnormal loads should be adequately escorted and appropriate traffic management and signage used.
- It is important that the local council road department is consulted on all transport issues and to make sure that deliveries do not conflict with other scheduled road works. For the same reason Transport Scotland would also be consulted with reference to trunk roads.
- The TMP will outline mitigation measures for construction, operation and decommissioning traffic.
- A pre-commencement survey in a format agreeable with the Council will be undertaken and secured through an appropriate planning condition. A Section 96 wear and tear agreement may be deemed necessary by the Council, and will be provided if required.

Summary of Effects

12.7.6 Table 12.16 summaries the traffic assessment for each section of the public road assessed, the potential environmental impacts, the proposed embedded mitigations for each and the residual effects.

Table 12.16 Summary of effects and embedded mitigation

Item Assessed	Potential Effect	Proposed Embedded Mitigation	Residual Effect
Construction Period			
1. Traffic Effect on the A95 at Locations 1055, 74436 and 30867	Negligible / Low Significance	Consultation with the Transport Scotland. Escorting and appropriate traffic management.	Negligible / Low Significance
2. Traffic Effect on the A941 at Location 20985	Negligible / Low Significance	Consultation with the Transport Scotland. Escorting and appropriate traffic management.	Negligible / Low Significance
3. Traffic Effect on Location A, B9138 West of Marypark	Moderate Significance	Consultation with the Local Council's Road Department. Escorting and appropriate traffic management. Informing local residents when movements are occurring. Road condition survey prior to and after construction.	Low / Moderate Significance
4. Traffic Effect on Location B, B9102 South of Site Entrance	Low Significance	Consultation with the Local Council's Road Department. Escorting and appropriate traffic management. Informing local residents when movements are occurring. Road condition survey prior to and after construction.	Negligible / Low Significance
5. Traffic Effect on Location C, C13e North of Upper Knockando	Low Significance	Consultation with the Local Council's Road Department. Escorting and appropriate traffic management. Informing local residents when movements are occurring. Road condition survey prior to and after construction.	Negligible / Low Significance
6. Noise and vibration.	Potential for Moderate Significance for large turbine deliveries	To reduce noise and vibration disturbance arrange the transport of heavy loads at times of least sensitivity e.g. no evening or night time deliveries through residential areas.	Low / Moderate Significance
7. Dust and dirt pollution.	Potential for Moderate Significance at the proposed wind farm access junction with minor road.	Arrange for adequate wheel washing facilities to allow construction vehicles to clean their wheels before entering onto the public road. Arrange road cleaning vehicle to keep the public road free of mud. Use of a water bowser to ensure dust is kept to a minimum from movements of construction vehicles on site in dry and windy conditions.	Low / Moderate Significance
8. Air pollution.	Potential for Moderate Significance. Temporary local air quality impact.	To reduce air pollution make sure that all construction vehicles are adequately maintained to comply with exhaust emission requirements and are switched off when not in use. Encourage the use of minibuses and car-sharing for personnel transport.	Low / Moderate Significance
Operational Period			
9.	Negligible / Low Significance	None required. Developer would encourage wind farm operators to be aware of any local road sensitivities.	Negligible / Low Significance
Decommissioning Period			

Item Assessed	Potential Effect	Proposed Embedded Mitigation	Residual Effect
10.	Potentially Significant	Re-assess potential traffic impact following methods agreed for decommissioning.	Require re-assessment prior to decommissioning.

12.8 CUMULATIVE IMPACT ASSESSMENT

12.8.1 Other development in the areas served by the roads assessed herein may generate their own construction, operational and decommissioning traffic (new urban development, shopping centres, quarries, forestry, etc.). Since the greatest changes in traffic associated with the proposed development will occur during the construction phase, it would typically be similar types of construction activity that could potentially generate traffic that adds to that of the proposed development.

12.8.2 The proposed development would be located in an area where there are a number of other wind farm developments proposed. It is known that the extension to the nearby Rothes III Wind Farm is currently in Scoping, for example. At the present time it is not possible to determine exactly if or when these proposed developments may be constructed (or their programme and phasing of operations), and therefore it is not known if construction period for each wind farm would occur concurrently.

12.8.3 If similar operations (such as import of rock, concrete or turbine components) were to occur concurrently, the traffic effects on these routes would rise. However, the above detailed assessment of traffic effects due to the proposed development concluded that all traffic effects were predicted to be Negligible / Low or Low / Moderate (and below the thresholds for significance in EIA terms). It is considered that there is therefore considerable “headroom” in the capacity of the receptors to accommodate these short term rises in traffic flows.

12.8.4 If the construction of another wind farm site were to coincide with that of the proposed development and was considered to have an unacceptable joint impact, then discussions would be held between developers and other relevant parties (in conjunction with the Roads Authorities) prior to the commencement of the projects, with a view to mitigating any such effects. The measures to be adopted would be enshrined in a robust Traffic Management Plan applying to each development, to ensure that any cumulative effects were avoided (e.g. by staging of deliveries and construction phasing).

12.9 CONCLUSION AND STATEMENT OF SIGNIFICANCE

12.9.1 Based on the criteria explained in the methodology in Section 12.2 this assessment concludes that:

- Traffic effect on the A95 at Locations 1055, 74436 and 30867 is considered to be of **Negligible / Low Significance**.
- Traffic effect on the A941 at Location 20985 is considered to be of **Negligible / Low Significance**.
- Traffic effect on B9138 at Location A is considered to be of **Low / Moderate Significance**.
- Traffic effect on B9102 at Location B is considered to be of **Negligible / Low Significance**.
- Traffic effect on the unclassified (C13e) at Location C is considered to be of **Negligible / Low Significance**.
- Noise and vibration impacts have potential for a **Moderate Significance**, but if the embedded mitigation measures proposed are adopted they would be of **Low / Moderate Significance**.
- Dust and dirt pollution has the potential for a **Moderate Significance**, but if the embedded mitigation measures proposed are adopted they would be of **Low / Moderate Significance**.
- Air pollution has the potential for a **Moderate Significance**, but if the embedded mitigation measures proposed are adopted they would be of **Low / Moderate Significance**.
- During the operation period of the wind farm **Negligible / Low Significant** impacts are foreseen.
- During the decommissioning period the activities have the potential for **similar significant impacts**. The impacts cannot be fully assessed until the methods for decommissioning have been agreed, nevertheless it would be expected that the impacts would be similar or less to those identified here and the similar embedded mitigation measures would be encouraged.

12.9.2 Taking into account the embedded mitigation measures proposed the overall impact of the proposed transport during construction and operation is deemed to have **Low / Moderate Significance** which is not significant in terms of EIA regulations.

Document history

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B	27/03/2018	Final Draft

Chapter 13

Human Health and Population

Contents

Glossary

Term	Definition
Environmental Impact Assessment	Environmental Impact Assessment (EIA) is a means of drawing together, in a systematic way, an assessment of the likely significant environmental effects arising from a proposed development
Environmental Statement	A document reporting the findings of the EIA and produced in accordance with the EIA regulations
The Existing Paul's Hill Wind Farm	The 'existing Paul's Hill Wind Farm' refers to the operational Paul's Hill Wind Farm
The proposed development	The proposed Paul's Hill II Wind Farm
The proposed development area	The red line boundary (application area)

List of Abbreviations

Abbreviation	Description
DECC	Department of Energy and Climate Change
ECU	Energy Consents Unit
EIA	Environmental Impact Assessment
ES	Environmental Statement
FORL	Fred. Olsen Renewables Limited
SAC	Special Area of Conservation
SIMD	Scottish Index of Multiple Deprivation
SSSI	Site of Special Scientific Interest

13.1 INTRODUCTION

13.1.1 This chapter of the Environmental Statement (ES) has been prepared on behalf of Fred. Olsen Renewables (the Applicant) in relation to the proposed Paul's Hill II Wind Farm development, located on the hills of Carn na Dubh-chlais in the Moray Council area, approximately 5 km west of Upper Knockando and to the east of the existing Paul's Hill Wind Farm. The proposed development also lies approximately 7 km north of the Cairngorms National Park. The nearest town is Elgin, approximately 30 km north of the proposed development.

13.1.2 This chapter is titled Human Health and Population, adhering with the new EIA regulations that came into effect on 16th May 2017. However, as the Scoping Report for the proposed development was submitted prior to this date, this application is being submitted under the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000 and Amendment Regulations 2008. Consequently, whilst there is no requirement to include the Human Health and Population chapter, it has been included to acknowledge the new regulations and gives due consideration to the human health and population impacts of the proposed development.

13.1.3 This chapter includes a section (see section 13.2) outlining the socioeconomic context of the proposed development locally, regionally and nationally. This included a review of publicly available information sources related to socioeconomic context of the area. This chapter also includes a section giving details of the economic and community benefits of the existing Paul's Hill Wind Farm and how the proposed Paul's Hill II Wind Farm could add to these benefits. This section additionally considers other socioeconomic factors such as the impact of wind farms on house prices and the impact of wind farms on tourism and recreation, both from a Paul's Hill II perspective and generally.

13.1.4 The chapter will additionally include the noise assessment (see section 13.3) of the proposed development, and will consider the potential for ice throw (see section 13.4).

13.1.5 There will be no shadow flicker assessment within the ES as the nearest residential property to the proposed development is located over 10 turbine rotor diameters from the nearest turbine. This is restated in section 13.5.

13.1.6 Scoping responses received as part of the Paul's Hill II Scoping Report with relevance to the assessment can be found in full in Appendix 1.2 which shows the full scoping opinion received from the Energy Consents Unit (ECU). This information is also summarised in Table 3.1 in Chapter 3: Site Selection and Design Evolution, of the ES and in the accompanying PAC Report. There were no specific comments received which have had an influence on the structure of this chapter, with the exception of Visit Scotland who requested that any potential impact on tourism made by the proposed development is fully assessed and considered.

13.1.7 This chapter, whilst wide ranging in its content, does not include every potential impact on human health and population. Potential impacts on private water supplied are considered in Chapter 10: Hydrology, Geology and Hydrogeology and impacts on visual amenity are considered in Chapter 6: Landscape and Visual Impact Assessment, of the ES.

13.2 SOCIOECONOMIC CONTEXT

13.2.1 This section will outline the socioeconomic context in which the proposed development is situated. This includes a review of relevant policy documents, population data (including migration), employment data and levels of social deprivation for Moray and for Scotland.

Population and Age Structure

13.2.2 This section will describe the population and age structure of Moray, the constituency in which the proposed development is located. The population and age structure for Scotland is also outlined.

13.2.3 The 2015 population statistics for Moray according to the National Records of Scotland 2017[1] are:

- The total population for Moray is estimated to be **95,510**. This is a **0.8%** increase from that of 2014. This accounts for **1.8 %** of the total population of Scotland.
- The working age population in Moray **(age 16-59)** is estimated to be **53,663**. This accounts for **56.2 %** of the total population of Moray. This figure is higher than the national average for Scotland of **42.1 %** of the population being of working age.
- Persons aged **60 years and over** make up **26.5 %** of the total population of Moray. This is higher than the percentage for Scotland, which is **24.2 %**.

Table 13.1 below shows the estimated population for different age groups in Moray and in Scotland.

Table 13.1: Estimated Population of Moray and Scotland in 2015

Moray			Scotland		
Age Group	**Total pop. of Moray**	**% of total pop. of Moray**	**Age Group**	**Total pop. of Scotland**	**% of total pop. of Scotland**
0-15	16,502	17.3 %	0-15	912,262	17.0 %
16-29	15,501	16.2 %	16-29	978,949	18.2 %
30-44	17,105	17.9 %	30-44	1,017,862	18.9 %
45-59	21,057	22.0 %	45-59	1,163,931	21.7 %
60-74	16,749	17.5 %	60-74	862,279	16.0 %
75+	8,596	9.0 %	75+	437,717	8.1 %
All ages	95,510	100.0 %	All ages	5,373,000	100.0 %

Source: National Records of Scotland, 2017

13.2.4 The population of Moray is projected to **decrease** by **2.2 %** (compared to the population in 2012) to **90,889** by 2037. In comparison, the population of Scotland is projected to **increase** by **8.8 %** between 2012 and 2037.

13.2.5 Over the 25 year time period between 2012 and 2037 the **75+** age group of the population is expected to **increase** the most in size, which is the same for Scotland as a whole.

13.2.6 Over the 25 year time period between 2012 and 2037 the **under 16** age group of the population is expected to **decline** the most significantly by **13.3 %**.

13.2.7 Table 13.2 below shows the working age (16-59) population projections for Moray and for Scotland.

Table 13.2: Working Age Population Projections for Moray and Scotland in 2012

Moray			Scotland		
2012	**2022**	**2037**	**2012**	**2022**	**2037**
58,294	55,593	49,032	3,150,000	3,076,000	3,037,000

Source: National Record of Scotland, 2017

13.2.8 Both Moray and Scotland show a predicted decrease in the working population. However, the working age population in Moray is expected to fall more than in Scotland as a whole.

13.2.9 The projected age structure for Scotland (2012 based) predicts a change of a **3 % decrease** in the working age population and a **3 % increase** in the pensioners' population (over 60).

13.2.10 Between 2012 and 2014, the highest migration movement was in the **16-29** age group. There was an overall net inflow of people into Moray of **454**.

13.2.11 The nearest localities are Aberlour, Rothes, Dufftown and Elgin. Table 13.3 below shows the distance from these settlements to the proposed development and their estimated populations (Scotland's Census, 2011).

Table 13.3: Localities Within Proximity to the Proposed Development

	Aberlour	**Rothes**	**Dufftown**	**Elgin**
Approximate distance from proposed development	13 km	15 km	18 km	30 km
Total population	972	1,252	1,667	23,128

Source: Scotland's Census, 2011

Employment

13.2.12 The main employment categories (above 10 % of the total population of Moray) of the in Moray are stated in Scotland's Census (2011)[2]. These are:

- **14.8 %** or **6805** jobs in wholesale and retail trade; repair of motor vehicles and motorcycles. This is roughly the same as the statistic for the whole of Scotland (**15 %**).
- **12.7 %** or **5839** jobs in human health and social work activities. This is slightly lower than the statistic for the whole of Scotland (**15 %**).
- **12.1 %** or **5563** jobs in manufacturing. This is higher than the statistic for the whole of Scotland (**8 %**).
- **11.9 %** or **5471** jobs in public administration and defence; compulsory social security. This is higher than the statistic for the whole of Scotland (**7 %**).
- **9.1%** are employed in construction and **0.3%** in the energy sector.

Economic Activity

13.2.13 On a local level, the economic activity of the population of the nearest localities to the proposed development are shown in Table 13.4 below.

Table 13.4: Economic activity of the population of Aberlour, Rothes, Dufftown and Elgin

	Aberlour	**Rothes**	**Dufftown**	**Elgin**
All persons 16 to 74	646	907	1221	16,781

[1] National Records For Scotland: Council Area Profiles (2017) Available: https://www.nrscotland.gov.uk/statistics-and-data/statistics/stats-at-a-glance/council-area-profiles (accessed 14/12/2017)

[2] Scotland's Census Area Profiles: Moray Council Area (2011) Available: http://www.scotlandscensus.gov.uk/ods-web/area.html (accessed 29/11/2017)

	Aberlour	Rothes	Dufftown	Elgin
% Economically active	68.1	67.5	70.8	72.8
% Employees – part time	15.8	16.0	17.0	16.4
% Employees – full time	40.1	40.9	40.6	44.5
% Self employed	8.4	6.5	8.2	5.6
% Unemployed	2.3	3.5	3.3	4.0
% Full time student – employed	1.2	0.6	1.5	1.9
% Full time student – unemployed	0.3	-	0.2	0.4
% Economically inactive	31.9	32.5	29.2	27.2
% Retired	22.8	19.5	20.2	14.4
% Student	2.6	4.5	2.5	3.4
% Looking after home or family	2.0	3.2	2.9	3.8
% Long term sick or disabled	3.6	3.2	2.5	3.9
% Other	0.9	2.1	1.1	1.7

Source: Scotland's Census, 2011

13.2.14 On a regional and national level, the economic activity of the population of Moray and of Scotland is shown in Table 13.5 below.

Table 13.5: Economic activity of the population of Moray and Scotland

	Moray	Scotland
All persons 16 to 74	68,410	3,970,530
% Economically active	71.5	69.0
% Employees – part time	15.7	13.3
% Employees – full time	41.4	39.6
% Self employed	8.4	7.5
% Unemployed	3.9	4.8
% Full time student – employed	1.7	2.9
% Full time student – unemployed	0.4	0.8
% Economically inactive	28.5	31.0
% Retired	16.3	14.9
% Student	3.4	5.5
% Looking after home or family	3.9	3.6
% Long term sick or disabled	3.2	5.1
% Other	1.5	1.9

Source: Scotland's Census, 2011

Deprivation Levels

13.2.15 The Scottish Index of Multiple Deprivation (SIMD) 2016[3] is the Scottish Government's official tool for identifying small areas of concentrations of multiple deprivation across Scotland. The SIMD ranks small areas, referred to as 'datazones', from most deprived (ranked 1) to least deprived (ranked 6.976). These small areas are then placed into deciles. The proposed development lies within the North Speyside area which is ranked in the **9th** decile, meaning social deprivation is low within the localities nearest to the proposed development area.

13.2.16 The predicted life expectancy in Moray at birth is **78.6** years for males and **81.8** years for females. This is higher than the predicted life expectancy for Scotland, which is **77.1** years for males and **81.1** years for females.

Scotland's Economic Strategy

13.2.17 Published in 2015, Scotland's Economic Strategy[4] sets out an ambition to make Scotland's economy more resilient and more cohesive and improve the quality of life of the country's citizens.

13.2.18 The strategy takes an approach that considers the two key pillars, which are to increase competitiveness and to tackle inequality. This is with the overarching aim to support long term, sustainable economic growth. The two 'pillars' are understood to be co-dependent on each other. The Scottish Government seek to do this by *"supporting entrepreneurialism and access to finance, encouraging companies to become more innovative and to exploit new commercial opportunities, and to help businesses to grow and expand both at home and overseas".*

13.2.19 The approach is said to be outcome focussed and seeks to place emphasis on partnership working to achieve its desired outcome in a whole economy approach, at national, regional and local levels.

13.2.20 The strategy considers its four priorities to be investment, innovation, inclusive growth and internationalisation.

13.2.21 The principles of Scotland's Economic Strategy are also being adopted in national energy and planning policy, as well as local development plans.

The Moray Economic Strategy

13.2.22 The Moray Economic Strategy[5], published in 2012 and produced by the Moray Community Planning Partnership outlines the long term economic diversification strategy desired for Moray. The strategy's overarching aim is to achieve a strong, diverse and sustainable economy for Moray, while achieving a high quality of life and wellbeing for residents within Moray.

13.2.23 The strategy outlines the core targets to achieving its overarching aim. These are:

- *"Population – encouraging growth across Moray with the potential to grow to over 90,000 in the next 10 years, attracting new residents and people aged 16-25 years;*
- *Employment – the creation of over 5,000 jobs with a focus on high quality jobs in engineering and science and technology – coupled with an increase in employment in long established activities, such as tourism and food and drink manufacturing. Job creation in the social enterprise sector is anticipated to increase; and*
- *Earnings – implementation of the strategy aims to realise average earnings in Moray to, or above, regional and Scottish averages by an emphasis on higher value activities."*

13.2.24 The drivers of this strategy are said to be as follows:

- "*People: To achieve a stable and balanced population;*
- *Business: To create sustainable economic growth;*

[3] The Scottish Index of Multiple Deprivation 2016 (2016) Available: http://simd.scot/2016/#/simd2016/BTTTTTT/12/-3.2492/57.4878/ (accessed 14/12/2017)

[4] Scotland's Economic Strategy (2015) Available: http://www.gov.scot/Publications/2015/03/5984/2 (accessed 08/12/2017)

[5] Moray Economic Strategy (2012) Available: http://www.moray.gov.uk/downloads/file83422.pdf (accessed 13/12/2017)

- *Infrastructure: To build viable and improving services;*
- *Communities: To create strong and confident communities; and*
- *Identity: To develop Moray's brand and presence"*

13.2.25 The strategy has a particular aim to develop a high profile, high value tourism offer.

Moray 2026

13.2.26 Moray 2026[6] outlines a 10 year plan for development in Moray, which replaced the Moray 2023 plan. The strategies top priority is to foster *"a growing, diverse and sustainable economy".* This will *"cover businesses, employment, infrastructure, public services and the third sector developing sustainable communities".*

13.2.27 The 5 key priorities identified within the partnership plan are:

- A growing, diverse and sustainable economy
- Healthier citizens
- Ambitious and confident young people
- Adults living healthier, sustainable independent lives safe from harm
- Safer communities.

13.2.28 Sustainability can be seen to be a key theme which carries throughout the plan.

Community Engagement and Participation

13.2.29 The plan focuses on community engagement with the desired outcome to achieve:

- *"More engaged, better informed, more resilient sustainable communities"* and;
- *"Coordinated, effective, sustainable community engagement and participation."*

13.2.30 The section of the plan aims to reflect the Scottish Governments aims outlined in the Community Empowerment Act 2015.

13.2.31 Furthermore, the plan sets out community engagement arrangements to continue into future years which have the following desired outcomes:

- *"Rationalise community engagement activities into a consolidated plan for the year";*
- *"Promote the plan widely with community groups";*
- *"Encourage community groups to invite relevant community planning partners to their meetings to discuss their areas of interest and priorities";*
- *"Encourage the use of participatory budgeting";*
- *"Recognise that local public sector employees represent a significant proportion of the adult population in Moray and, therefore, promote engagement through internal mechanisms";*
- *"Highlight that public services need to change and a number of services will need to contract, be met in different ways or be removed";*
- *Highlight that community groups need to take early action to influence priorities and also to identifying what more could be done by communities, as well as the support they may need to do so" and;*
- *To support communities particularly those communities whose voices are often less heard to participate effectively".*

13.2.32 These aims are put in place with the desire to achieve a more community-led approach to local planning and place making.

Employability Moray

13.2.33 The strategic partnership with Employability Moray has the overarching aim to invest in young people to achieve positive and sustained employment within Moray. Developing a young and successful workforce is hoped to translate into lifelong learning and skills investment.

Sustainability & Communities Partnership

13.2.34 The Sustainability and Communities Partnership has targets set to reduce energy consumption and to lower the carbon footprint of Moray. These are steps in the movement to combat climate change. Climate change is recognised as a growing focus both on national and international levels and the partnership aims to continue this focus locally.

Aberlour Community Action Plan

13.2.35 Community Action Plans are a recognised way to empower communities and give them the opportunity to plan for their futures. The Aberlour Community Action Plan was produced for the community of Aberlour by The Moray Council, Community Support Unit, Moray Health and Social Care Partnership and several other organisations and individuals. The action plan sets out a strategy to ensure planning in Aberlour creates a sense of place and belonging while enhancing its assets through an inclusive approach involving as many organisations and individuals as possible. This was undertaken using the Planning For Real method.

13.2.36 Broadly, the 5 main concerns within the community that were felt to need action were:

- Traffic, transport and access
- Environment and sustainability
- Leisure and tourism
- Facilities and services
- Crime and safety

These themes align with those priorities outlined in Moray 2026.

13.2.37 It was also found that residents would like emphasis to be placed on local amenities. More specifically, the section detailing "what needs to happen" lists particular projects that would help improve the community. For example, the following were stated to require funding for the projects to move forward.

- Safety fence/rail/barrier at Alice Littler Park.
- Sign posts to facilities/attractions in leisure and tourism.
- Improvements to Alice Littler Park and play park.
- Draining, flooding and erosion works at Alice Littler Park, Speyside Way and River Bank.
- Building of a community skate and rollerblading park.
- Building of a new ages 6-12 adventure playground.

13.2.38 The importance of the River Spey and its SSSI and SAC status is also recognised within the plan, along with the importance of the Speyside Way to the area. These should not be negatively impacted by development.

[6] Moray 2026 (2016) Available at: http://www.moray.gov.uk/downloads/file92241.pdf (accessed 29/11/2017)

Socioeconomic and Community Benefits

13.2.39 This section will describe the potential benefits of the proposed development on a local, regional and national level. Although recognised as not being a material planning consideration this includes detail of the tangible community benefit that has come from the existing Paul's Hill Wind Farm, including examples of projects which have benefitted. It also includes detail on the employment, investment and contracting opportunities the proposed development can offer, during the construction phase and the operational phase of the proposed development.

The Existing Paul's Hill Wind Farm

Energy Generation

13.2.40 The existing Paul's Hill Wind Farm became operational in 2006. Analysis of production figures show that between 2007 and 2014, the wind farm has produced nearly 1300 GWh's of electricity generation and averaged a capacity factor of 31.6%. This shows that with the exception of 1 year Paul's Hill Wind Farm produced the equivalent of over 70% of Moray domestic consumption (calculated as 1636 GWh's). Again, with the exception of one year, this electricity production met the equivalent needs of over 30,000 Moray households.

Environmental Offset

13.2.41 Since the existing Paul's Hill Wind Farm became operational in 2006, the developer, FORL, has contracted an ecologist to cover ongoing site surveys to monitor the ecological conditions, and continue to mitigate when required. The total spend by the developer for this has been approximately **£0.7 million** from 2006 to September 2017. The developer's commitment to this cost is expected to continue when the proposed Paul's Hill II Wind Farm development commences operation in October 2021.

Since the existing Paul's Hill Wind Farm became operational in 2006 the amount of carbon saved by the development has been calculated in Tonnes of Carbon Dioxide Equivalent (tCO_2e). From the time period 2007 – 2014 this amounted to **361,998 tCO_2e**, based on the assumption of a carbon saving of 254 kg per MW of energy produced by the Paul's Hill Wind Farm. This carbon saving is expected to be added to by the proposed Paul's Hill II Wind Farm, which is expected over its lifetime to save over **835,000 tonnes of CO_2** when replacing fossil fuel electricity generation (see Appendix 10.5: Carbon Balance Assessment).

Community Spend

13.2.42 To date, the Paul's Hill Wind Farm fund has voluntarily contributed over **£0.4 million** to local communities. The flexible nature of the fund has enabled a wide variety of projects to be supported locally. Examples of how communities have spent the fund are detailed below.

Aberlour Community Council

- Installation of gents' toilets at the community hall
- Help with admin costs for running the Speyside community car share scheme which provides affordable transport to disadvantaged members of the community
- Fabrication and installation of artwork at Speyside High School
- Replacement fencing at Aberlour Tennis Club
- Application for improvements to the village hall, Fleming Hall
- Uniforms and equipment for the pipe band
- New equipment for the school and community centre

Knockando Community Council

- Help with admin costs for the Speyside community car share scheme
- Costs for the village Christmas party
- Equipment for members of the Spey Leg Club such as water heaters and treatment chairs
- Running costs for the Knockando Playgroup
- Provide transportation for the local annual picnic

Cromdale and Advie Community Council

- Stationary and rental costs for the community hall
- Fun day celebrations
- Upgrade of the village hall water supply
- A TV license for the village hall
- Hogmanay party costs

Edinville Community Council

- Renovations of the village hall
- Install oil central heating in the village hall
- Fit blinds in the community hall
- Replace the external fire exit at the community hall

Glenlivet and Inveravon Community Council

- Contribution to the community broadband scheme
- Contribution towards the replacement of the walkway/bridge at Tomnavoulin

Archiestown Community Council

- Fit new fencing at the playing field
- Installation of toilet facilities

Carron Community Council

- Purchase of new playgroup equipment
- Roadworks within the community area

Employment

13.2.43 The existing 64.4 MW Paul's Hill Wind Farm has offered a variety of employment opportunities in the area.

13.2.44 Based on a rate of **£1,318,875** of construction costs per MW[7], during the construction phase of the existing development **222** job years were created in Scotland and **74** of these were in Moray.

13.2.45 Based on a rate of **£59,867** of operations costs per MW[7], during the operational phase of the existing development **13** jobs were created in Scotland and **6** of these were in Moray.

13.2.46 The proposed development has a capacity of 21 MW and is expected to offer further employment opportunities in the area.

[7] Renewable UK: Onshore Wind: Economic Impacts in 2014 (2015) Available: http://c.ymcdn.com/sites/www.renewableuk.com/resource/resmgr/Publications/Reports/onshore_economic_benefits_re.pdf (accessed 14/12/2017)

13.2.47 Based on the same rate of **£1,318,875** of construction costs per MW[7], during the construction phase of the proposed development it has been estimated that **72** job years will be created in Scotland and **24** of these will be in Moray.

13.2.48 Based on the same rate of **£59,867** of operations costs per MW[7], during the operational phase of the proposed development it has been estimated that **4** jobs will be created in Scotland and **2** of these will be in Moray. The jobs created in Moray would be expected to help support the existing team working at the operations centre that servesr both Paul's Hill and Rothes wind farms.

Combined Benefits

13.2.49 The construction phase of both the existing Paul's Hill Wind Farm and the proposed development combined has, and will have provided **294** job years in Scotland, with **98** of these being in Moray.

13.2.50 Post construction of Paul's Hill II Wind Farm, the operational phase of the of the wind farm as a whole will support a total of **17** jobs in Scotland, with **8** of these being in Moray.

13.2.51 In addition, the Paul's Hill Wind Farm development will provide an increased combined contribution to **CO_2** savings, business rates and community benefits.

Ballindalloch Estate

13.2.52 The land on which the proposed development is located is owned by Ballindalloch Estate. Ballindalloch estate is an attraction to both visitors and locals for its leisure facilities, such as Ballindalloch Golf Club and Ballindalloch Castle and Gardens. The estate also hosts a distillery and is home to other recreational activities, such as farming, forestry, fishing and shooting. Moreover, the estate offers holiday lets.

13.2.53 Lease payments from the wind farm have assisted the estate in the creation of the Ballindalloch Distillery, which now presents a source of long term income for the estate and the distillery employee.

13.2.54 To date, the existing Paul's Hill Wind Farm has been beneficial to Ballindalloch Estate[8]. Paul's Hill Wind Farm adds to the sustainability of the estate by harnessing the areas natural wind resource to produce clean, renewable energy.

13.2.55 Ballindalloch estate recognises the benefits Paul's Hill Wind Farm brings to the local Speyside community, with the community benefit fund payments, for example. These benefit payments help improve local amenities and sustain the local environment. This helps to improve the quality of the local environment for local residents and helps encourage more visitors to the area. Examples of how communities have spent the funding from the Paul's Hill Community Fund can be found in section 13.2.43.

13.2.56 The proposed development is expected to maintain and increase the positive impacts experienced by Ballindalloch Estate, and in turn continue to have a positive impact on both local residents and visitors to the area.

Other Socioeconomic Factors

13.2.57 There are potentially a number of other socioeconomic factors that are associated with the development of a wind farm. Two issues which typically arise in consultation with consultees and the general public include the potential impact on house prices and the potential impact on tourism and recreation.

Impact of Wind Farms on House Prices

13.2.58 This section has been included in response to comments received during public consultations, there were concerns raised about the potential impact of the proposed development on house prices.

13.2.59 In a report by renewableUK[9], it is concluded that although there is a lot of presumption that wind farms have a negative impact on house prices, there is no clear and conclusive evidence.

13.2.60 A further study focussing on Scotland by CXC[10] produced similar, inconsistent results. The complex set of results vary considerably between different areas in Scotland. In the majority of cases explored there appeared to be either a positive impact on house prices, or no impact related to the presence of a wind farm, although the positive or neutral impact could not be said categorically to be influenced by the presence of the wind farms (other factors such as the economy or housing demand could well be the most influential factor).

13.2.61 Overall, from the studies carried out there appears to be positive, neutral and marginally negative impacts observed on house prices, which may or may not be related to the proximity of a wind farm. The location of a wind farm being only one factor amongst many that could influence house prices.

Impact of Wind Farms on Tourism and Recreation

13.2.62 The impact on tourism and recreation has been considered in detail throughout Chapter 6: Landscape and Visual Impact Assessment. The impact and tourists and visitors to places of historical interest has also been considered in detail in Chapter 9: Cultural Heritage. These chapters have variously given due consideration to tourism and recreational destinations and receptors including, but not limited to, the following:

- Cairngorms National Park;
- Spey Valley AGLV;
- Mountains and hills such as Ben Rinnes, Ben Aigan and Ben Muir Hills;
- Speyside Way;
- Dava Way;
- Tourist routes and road routes including A94, A941 and B9009, B9102 and the B970
- Core paths SP19 and SP20
- Ballindalloch Castle (including the Dovecot and grounds)
- Car users
- Walkers, horse riders, cyclists and other recreational participants

13.2.63 Other recreational groups such as the Highland Gliding Club have also been consulted in relation to the proposed development and a summary of responses are provided in Table 3.1 of Chapter 3: Site Selection and Design Evolution, of the ES. As at the time of writing no tourism or recreational interest has raised an objection to the proposal and any concerns raised are considered within this ES.

13.2.64 It is acknowledged that Tourism is an important part of the economy in the Moray area and that Moray Speyside Tourism in their Moray's Tourism Strategy[11] considers that tourism makes up **10 %** of Moray's total employment

[8] Ballindalloch Estate: Paul's Hill Wind Farm (2018) Available: http://www.ballindallochhighlandestate.com/pauls-hill-wind-farm/ (accessed 25/01/18)

[9] The effect of wind farms on house prices (2014) renewableUK publication

[10] Impact of wind turbines on house prices in Scotland (2016) Climate X Change publication

[11] Moray Speyside Tourism Business Plan 2017 – 2019 (2016) Available: http://www.moray.gov.uk/minutes/data/DC20160920/Item%207%20-%20Appendix%201-Visitor%20Economy.pdf (accessed 29/11/2017)

and turns over **3.8 %** of total business turnover in Moray. It is also acknowledged that there is an ambition to double the size of the tourism economy by 2025.

13.2.65 It is considered that the presence of wind farms such as the proposed Paul's Hill II Wind Farm should not be an impediment to this ambition. There are now several surveys and research studies on public attitudes towards wind farm developments and the potential effects they have on tourism. These include the following:

- BiGGAR Economics Wind Farms and Tourism Trends in Scotland[12];
- ComRes 10:10 Energy Survey the UK[13];
- DECC: Public Attitudes Tracking Survey Headline Findings – Wave 22[14];
- University of Edinburgh: Tourism Impacts of Wind Farms[15];
- Visit Scotland: Wind Farm Consumer Research [16].

13.2.66 The BiGGAR Economics study concluded that:

"Published national statistics on employment in sustainable tourism demonstrates that there is no relationship between the development of onshore wind farms and tourism employment at the level of the Scottish economy, at local authority level nor in the areas immediately surrounding wind farm development."

13.2.67 In the Com Res study, the survey asked respondents to what extent they supported or opposed the use of onshore wind farms in the UK amongst other energy technologies. **73 %** of respondents supported onshore wind farms, **17 %** were opposed to onshore wind farms and the remaining **10 %** of respondents were unsure.

13.2.68 The DECC: Wave 22 study saw a continuation of the trend of high support for renewable energy with **77 %** expressing support for the use of renewable energy. Opposition to renewable energy was low at **4 %** with only **1 %** who were strongly opposed.

13.2.69 The Research by the University of Edinburgh found that an average of 91% of Tourists to various locations in the UK were not discouraged to visit the areas due to the presence of wind farms.

13.2.70 In the Visit Scotland research, respondents were asked whether the presence of a wind farm would affect their decision on where to visit or where to stay on a UK holiday or short break. **80 %** of UK respondents claimed their decision would not be affected and **20 %** claimed that it would be affected.

13.2.71 Overall, in light of the specific assessment work that has been undertaken in the landscape and cultural heritage chapters it is considered there should be no significant negative impact on tourism and recreation created by the proposed development.

Conclusion

13.2.72 Data presented here shows that there is a healthy, working population at present in Moray. Although the working age population in Moray is expected to decrease over the lifespan of the wind farm, the working age population remains sufficient over the proposed 12 month construction period beginning in 2021. Moray has a working age population higher than the national average for Scotland. Although employment levels are relatively high, there is still a percentage unemployed and in part time employment. Although the working age population is expected to fall by 3 % and the retired population expected to rise by 3 %, this is a minor change.

13.2.73 The proposed development is anticipated to contribute positively to the economy, in keeping with both Moray and Scotland's economic strategies to promote economic development in order to achieve a more resilient, cohesive economy that is sustainable in the long term. This is also positive in consideration with the Aberlour Community Action Plan. The proposed development will create a significant number of jobs, particularly during the construction phase. This will help Moray's Economic Strategy achieve its goal of creating 5000 new jobs in the region. This job creation will also contribute to supporting Moray in developing a young, successful workforce. It is anticipated this will also have a positive knock on effect and benefit the Scottish economy, as well as in Moray and locally within the communities in proximity to the proposed development. It is anticipated that a number of full time operational jobs would be created, following the construction phase, also benefitting employment in the local area. This will also result in investment in the local area, with subcontractors using local facilities during this construction phase.

13.2.74 The existing Pauls Hill Wind Farm has contributed significantly to the supply of low carbon electricity onto the local grid network. As the nature of power generation and usage changes in coming years the contribution that the proposed development will make to ensuring that a sustainable supply of efficiently generated low carbon electrical power is available for community and business use across the Moray area and beyond is likely to be as significant if not more significant.

13.2.75 The existing Paul's Hill Wind Farm has also positively contributed to the local economy in relation to community funds. Some details of how these funds have been spent are provided in the chapter. The proposed Paul's Hill II Wind Farm will continue and extend the community benefits for local communities. This complies with local development desires to achieve a diverse and sustainable economy as well as supporting wellbeing amongst communities in the surrounding area.

13.2.76 The proposed development has the potential to create positive socioeconomic impacts locally, regionally and nationally. As with the existing Paul's Hill Wind Farm, the proposed development also has the potential to coexist with its neighbouring properties and settlements and create positive community and economic benefits for the local area and beyond.

13.2.77 The proposed development has also been considered in relation to its potential impacts on tourism and recreation both here in this chapter and in other parts of the ES such as Chapter 6: Landscape and Visual Impact Assessment and Chapter 9: Cultural Heritage Assessment. On the basis of these assessments it is considered that there should be no significant impacts on tourism and recreational interests in the area.

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[12] BiGGAR Economics: Wind Farms and Tourism Trends in Scotland (2017) Available: http://www.biggareconomics.co.uk/wp-content/uploads/2017/11/Wind-Farms-and-Tourism-Trends-in-Scotland-Oct17.pdf (accessed 06/12/2017)

[13] ComRes 10:10 Energy Survey (2016) Available http://www.comresglobal.com/wp-content/uploads/2016/10/20161014_10-10_Energy-Survey_final-data-tables.pdf (accessed 06/12/2017)

[14] DECC: Public Attitudes Tracker Headline Findings - Wave 22 (2017) Available: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/634723/pat-wave-22-summary-report.pdf (accessed 06/12/2017)

[15] Aichitson, C. Tourism Impacts of Wind Farms (2012) Available: http://www.parliament.scot/S4_EconomyEnergyandTourismCommittee/Inquiries/20120426_uni_of_ed.pdf (accessed 06/12/2017)

[16] Visit Scotland: Wind Farm Consumer Research (2012) Available: http://www.visitscotland.org/pdf/Windfarm%20Consumer%20Research%20final_docUpdatedx.pdf (accessed 07/12/2017)

13.3 NOISE ASSESSMENT

13.3.1 This section contains an assessment of the operational, construction, and decommissioning phases of the proposed Paul's Hill II Wind Farm development. The assessment has been undertaken by the Hayes McKenzie Partnership Ltd.

13.3.2 The operational noise assessment has been undertaken by comparing cumulative predicted noise levels from all wind farms in the area that may affect surrounding residential properties with noise limits contained within *ETSU-R-97, The Assessment and Rating of Noise from Wind Farms,* as referred to within the Scottish '*web based planning guidance'*, referred to in PAN1/2011. Cumulative operational noise levels have also been compared with the existing noise limits imposed for the operational Paul's Hill Wind Farm.

13.3.3 The assessment has been performed with reference to the guidance contained within the Institute of Acoustics document, *A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise*, which is endorsed by Scottish Government.

13.3.4 Construction and decommissioning noise on-site has been assessed with reference to BS:5228:2009, *Code of practice for noise and vibration control on construction and open sites*.

Potential Noise Effects

13.3.5 Noise and vibration will occur during the construction, operation and de-commissioning of the proposed wind farm. The extent to which this is significant depends on the noise sources, in each case, and the distance of each of the noise sources to potential receptors.

13.3.6 Potential receptors in this case are considered to be residential properties. During the construction and de-commissioning phases, the effects can be divided into noise and vibration from on-site activities and from construction traffic accessing the site. During operation, noise is generated by the turbines as they rotate with noise output depending on wind speed.

13.3.7 For on-site construction noise, and operational noise at different wind speeds, the levels received at residential properties will depend on wind direction. Vibration from on-site construction activities and during operation will not be perceptible at residential properties. Vibration from construction vehicles accessing the site may be perceptible at roadside properties but will be no greater than from other heavy good vehicles and will not be significant.

13.3.8 Noise will also arise from works relating to highways upgrading required for turbine component delivery, and from cabling activities between the wind farm and the grid connection point.

13.3.9 Noise arising during decommissioning would typically include removal of the turbine structures, and breaking up of the concrete foundations, and removal of access tracks.

Planning Policy

Planning Advice Note PAN1/2011, Planning and Noise

13.3.10 PAN1/2011[17] identifies two sources of noise from wind turbines; mechanical noise and aerodynamic noise. It states that "*good acoustical design and siting of turbines is essential to minimise the potential to generate noise*". It refers to the 'web based planning advice' on renewables technologies for onshore wind turbines.

Scottish Government 2014, Web Based Planning Advice, Onshore Wind Turbines

13.3.11 The web based planning advice[18] (The Scottish Government, 2014) on onshore wind turbines re-iterates the sources of noise as "*the mechanical noise produced by the gearbox, generator and other parts of the drive train and the aerodynamic noise produced by the passage of the blades through the air*" and that "*there has been significant reduction in the mechanical noise generated by wind turbines through improved turbine design".* It states that *"the Report, "The Assessment and Rating of Noise from Wind Farms" (Final Report, Sept 1996, DTI), (ETSU-R-97), describes a framework for the measurement of wind farm noise, which should be followed by applicants and consultees, and used by planning authorities to assess and rate noise from wind energy developments, until such time as an update is available*". It notes that "*this gives indicative noise levels thought to offer a reasonable degree of protection to wind farm neighbours, without placing unreasonable burdens on wind farm developers, and suggests appropriate noise conditions*".

13.3.12 It introduces the Institute of Acoustics (IoA) *A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise*, and states that "*The Scottish Government accepts that the guide represents current industry good practice*".

13.3.13 The accompanying Technical Advice Note[19] to PAN1/2011, *Assessment of Noise*, lists BS 5228, *Noise and Vibration Control on Construction and Open Sites* as being applicable for Environmental Impact Assessment (EIA) and planning purposes.

The Assessment and Rating of Noise from Wind Farms: ETSU-R-97

13.3.14 *ETSU-R-97, The Assessment and Rating of Noise from Wind Farms*[20], presents the recommendations of the Working Group on Noise from Wind Turbines, set up in 1993 by the Department of Trade and Industry (DTI) as a result of difficulties experienced in applying the noise guidelines existing at the time to wind farm noise assessments. The group comprised independent experts on wind turbine noise, wind farm developers, DTI personnel and local authority Environmental Health Officers. In September 1996 the Working Group published its findings by way of report ETSU-R-97. This document describes a framework for the measurement of wind farm noise and contains suggested noise limits, which were derived with reference to existing standards and guidance relating to noise emission from various sources.

13.3.15 ETSU-R-97 recommends that, although noise limits should be set relative to existing background and should reflect the variation of both turbine and background noise with wind speed; this can imply very low noise limits in particularly quiet areas, in which case, "*it is not necessary to use a margin above background in such low-noise environments. This would be unduly restrictive on developments which are recognised as having wider global benefits. Such low limits are, in any event, not necessary in order to offer a reasonable degree of protection to the wind farm neighbour*."

13.3.16 For day-time periods, the noise limit is 35-40 dB L_{A90} or 5 dB(A) above the 'quiet day-time hours' prevailing background noise, whichever is the greater. The actual value within the 35-40 dB(A) range depends on the number of dwellings in the vicinity; the impact of the limit on the number of kWh generated; and the duration of the level of exposure.

13.3.17 For night-time periods the noise limit is 43 dB L_{A90} or 5 dB(A) above the prevailing night-time hours background noise, whichever is the greater. The 43 dB(A) lower limit is based on an internal sleep disturbance criteria of 35 dB(A) with an allowance of 10 dB(A) for attenuation through an open window and 2 dB(A) subtracted to account for the use of L_{A90} rather the L_{Aeq}.

13.3.18 Where predicted noise levels are low at the nearest residential properties a simplified noise limit can be applied, such that noise is restricted to the minimum ETSU-R-97 level of 35 dB L_{A90} for wind speeds up to 10 m.s-1 at 10 m height. This removes the need for extensive background noise measurements for smaller or more remote schemes.

13.3.19 It is stated that the $L_{A90,10min}$ noise descriptor should be adopted for both background and wind farm noise levels and that, for the wind farm noise, this is likely to be between 1.5 and 2.5 dB less than the L_{Aeq} measured over the

[17] Planning Advise Noise PAN1/2011, Planning and Noise, Scottish Government, 2011

[18] http://www.gov.scot/Resource/0045/00451413.pdf (accessed 27/09/2017)

[19] http://www.gov.scot/Resource/Doc/343341/0114220.pdf (accessed 27/09/2017)

[20] ETSU-R-97, The Assessment and Rating of Noise from Wind Farms, Department of Trade and Industry, 1996

same period. The $L_{Aeq,t}$ is the equivalent continuous 'A' weighted sound pressure level occurring over the measurement period 't'. It is often used as a description of the average ambient noise level. Use of the L_{A90} descriptor for wind farm noise allows reliable measurements to be made without corruption from relatively loud, transitory noise events from other sources.

13.3.20 ETSU-R-97 also specifies that a penalty should be added to the predicted noise levels, where any tonal component is present. The level of this penalty is described and is related to the level by which any tonal components exceed the threshold of audibility.

13.3.21 With regard to multiple wind farms in a given area, ETSU-R-97 specifies that the absolute noise limits and margins above background should relate to the cumulative impact of all wind turbines in the area contributing to the noise received at the properties in question. Existing wind farms should therefore be included in cumulative predictions of noise level for proposed wind turbines and not considered as part of the prevailing background noise.

A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise

13.3.22 In May 2013, the Institute of Acoustics (IoA) published *A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise*[21], as referred to in the Web Based Planning Advice. This was subsequently endorsed by the Secretary of State for Energy and Climate Change and by the Scottish Ministers. The publication of the Good Practice Guide (GPG) followed a review of current practice[22] carried out for the Department of Energy and Climate Change (DECC) and an IoA discussion document[23] which preceded the GPG.

13.3.23 The GPG includes sections on Context; Background Data Collection; Data Analysis and Noise Limit Derivation; Noise Predictions; Cumulative Issues; Reporting; and Other Matters including Planning Conditions, Amplitude Modulation, Post Completion Measurements and Supplementary Guidance Notes. The Context section states that the guide "*presents current good practice in the application of the ETSU-R-97 assessment methodology for all wind turbine development above 50 kW, reflecting the original principles within ETSU-R-97, and the results of research carried out and experience gained since ETSU-R-97 was published*". It adds that "*the noise limits in ETSU-R-97 have not been examined as these are a matter for Government*".

13.3.24 As well as expanding on and, in some areas, clarifying issues which are already referred to in ETSU-R-97, additional guidance is provided on noise prediction and a preferred methodology for dealing with wind shear. The guidance within the GPG has been considered and generally followed for this assessment.

Cumulative Noise

13.3.25 Section 5.1 of the IoA GPG deals with cumulative noise, and re-iterates the position set out in ETSU-R-97 that "*absolute noise limits and margins above background should relate to the cumulative effect of all wind turbines in the area which contribute to the noise received at the properties in question*".

13.3.26 The IoA GPG defines when a cumulative noise assessment is necessary and states that, "*if the proposed wind farm produces noise levels within 10 dB of any existing wind farm/s at the same receptor location, then a cumulative noise impact assessment is necessary*". This is because if the predicted noise is more than 10 dB below that already existing (or the applicable noise limit) its contribution to the overall noise level is negligible.

Other Potential Operational Wind Farm Noise Impacts

Tonal Noise

13.3.27 If tonal noise is associated with a sound source it is generally then more noticeable, and in line with other noise guidance that penalises noise which is tonal, a penalty is added to wind turbine noise if there is tonal noise which is audible at residential properties. In this case, it has been assumed that there would be no tonal noise associated with the operation of the wind farm which would give rise to a tonal penalty as set out in ETSU-R-97. A penalty is usually included with the planning conditions for wind farms that can be used to ensure that noise levels, including a tonal penalty, do not exceed acceptable levels in practice.

Low Frequency and Infrasound

13.3.28 Work carried out in 2006 to investigate the extent of low frequency and infrasonic noise from three UK wind farms24 concluded that 'the common cause of complaints associated with noise at all three wind farms is not associated with low frequency noise, but is the audible modulation of the aerodynamic noise, especially at night'. It is therefore considered that low frequency and infrasound can be scoped out of the assessment, but AM is considered in more detail below.

Amplitude Modulation

13.3.29 The variation in noise level associated with turbine operation, at the rate at which turbine blades pass any fixed point of their rotation (the blade passing frequency), is often referred to as blade swish and amplitude or aerodynamic modulation (AM). This effect is identified within ETSU-R-97 where it is envisaged that '… modulation of blade noise may result in variation of the overall A-Weighted noise level by as much as 3 dB(A) (peak to trough) when measured close to a wind turbine... ' and that at distances further from the turbine where there are '… more than two hard, reflective surfaces, then the increase in modulation depth may be as much as 6 dB(A) (peak to trough)'. There have been instances were level of AM are higher than this, which results in the noise being perceived as more intrusive (in the same way as tonal content makes the noise more intrusive).

13.3.30 The Government released a Wind Turbine AM Review[25] report in October 2016 (although the Phase 2 report is dated August 2016). Phase 1 of the report sets out its approach and methodology, and the Phase 2 report includes a literature review, its research into human response to AM, and recommends how excessive AM might be controlled through the use of a planning condition. The report includes recommendations on how AM should be addressed when quantified according to the recommendations of a separate Institute of Acoustics (IoA) working group document, *A Method for Rating Amplitude Modulation in Wind Turbine Noise*[26].

13.3.31 The AM Review reports recommend a two tier approach whereby the first tier would be to seek a reduction in the depth and/or occurrence of AM with a rating level (according to the IOA AMWG method) ≥3 dB. Whether remedial action is required depends on the prevalence of any complaints, and how often AM rating levels ≥3 dB occur. The second tier is that if AM is deemed to be a significant issue, and if nothing can be done to reduce the level of AM, then a penalty scheme has been proposed whereby a penalty ranging from 3 dB (for a rating level of 3 dB) up to a maximum of 5 dB (for a rating level of 10 dB and above) should be added to the measured level before measured levels are compared with the relevant noise limits.

[21] Institute of Acoustics (IoA) 2014, A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise

[22] Report on DECC Research Contract 01.08.09.01/492A (Analysis), Analysis of How Noise Impacts are Considered in the Determination of Wind Farm Planning Applications, Department of Energy and Climate Change, 2011

[23] Discussion Document on "A Good Practice Guide to the Application of ETSU-R-97 for Wind Turbine Noise Assessment, Institute of Acoustics, July 2012

[24] W/45/00656/00/00, The Measurement of Low Frequency Noise at Three UK Windfarms, Department of Trade and Industry, 2006

[25] Wind Turbine AM Review (Phase 1 and 2 reports), for the Department of Energy & Climate Change (now the Department for Business, Energy and Industrial Strategy), published October 2016

[26] UK Institute of Acoustics, IOA Noise Working Group (Wind Turbine Noise) Amplitude Modulation Working Group, Final Report, A Method for Rating Amplitude Modulation in Wind Turbine Noise, 9 August 2016, Version 1.

13.3.32 It should be noted that most wind farms operate without significant AM, and that it is not possible to predict the likely occurrence of AM, but, like tonal noise, AM can be covered by a suitably worded planning condition. The proposed wording for such a condition can be seen in an article[27] jointly authored by a number of consultants working in the area in the November/December 2017 issue of the Institute of Acoustics' *Acoustics Bulletin* magazine.

Construction Noise

13.3.33 The Scottish Government's Technical Advice Note, *Assessment of Noise*, states that, for planning purposes, construction noise should be assessed according to BS 5228, *Noise and Vibration Control on Construction and Open Sites*[28]. The standard provides example criteria for the assessment of the significance of construction noise effects and a method for the prediction of noise levels from construction activities. Two example methods are provided for assessing significance.

13.3.34 The first is based on the use of criteria defined in Department of the Environment Advisory Leaflet (AL) 72, *Noise Control On Building Sites*[29] which sets a fixed limit of 70 dB(A) in rural suburban and urban areas away from main roads and traffic. Noise levels are generally taken as façade LAeq values with free-field levels taken to be 3 dB lower, giving an equivalent noise criterion of 67 dB L_{Aeq}.

13.3.35 The second is based on noise change, with a 5 dB increase in overall noise considered to be significant. However, when existing noise levels are low, such as at this site, and construction activities continue for more than one month, minimum criteria are applicable. These are 45, 55 and 65 dB L_{Aeq}, for night-time (2300-0700), evening and weekends, and daytime (0700-1900) including Saturdays (0700-1300) respectively.

Noise Limits for Existing Wind Farms

Paul's Hill Wind Farm Noise Limits

13.3.36 Paul's Hill wind farm is an existing 28 turbine wind farm adjacent to the proposed Paul's Hill II wind farm. It is operated by Fred Olsen Renewables who are the developers of the Paul's Hill II wind farm.

13.3.37 Noise limits for Paul's Hill are set out in the planning conditions on its consent. Condition 7.8 relates to noise and states:

7.8 Noise from the wind turbines shall not exceed an LA90 10 MIN of 35dB at the nearest noise sensitive premises. This condition shall apply to wind speeds not exceeding 10m/s as measured at a height of 10m above ground level at the wind turbines. If distinct audible tones are generated by any wind turbine, the noise limit shall be reduced by 5dBA. The company shall implement assessment and mitigation procedures in accordance with the guidance produced by Department of Trade and Industry's Working Group on Noise from Wind Turbines, a copy of which is appended to this consent.

Berry Burn Wind Farm

13.3.38 Berry Burn wind farm is a 29 turbine wind farm located to the north-west of the operational Paul's Hill wind farm. Operational noise limits for the site wind farm are set out in the planning conditions on its consent at condition 6.22 and are very similar to the Paul's Hill noise conditions and state:

6.22 Noise arising from the wind turbines shall not exceed an LA90, 10 min of 35dB at the nearest noise sensitive property in the area of The Moray Council. This condition shall apply at wind speeds not exceeding 10ms-1, as measured at the height of 10m above ground level at the wind farm and shall only apply to dwellings (vacant or occupied) existing at the date this consent. Should these noise levels be exceeded, the Company shall take steps to ensure that noise emissions from the wind farm as reduced to the aforementioned noise levels or less. In respect of the property "Rochuln", wind turbine noise shall not exceed LA90, 10 mins of 45dB, as measured at wind speeds not exceeding 10ms-1, and at a height of 10, above ground.

13.3.39 Tonal noise is covered in condition 6.23, an extract of which is reproduced below:

When required by the Planning Authority, the Company will be required to carry out an assessment for tonal noise in accordance with the procedure recommended in Chapter 6 of the document "The Assessment and Rating of Noise from Wind Farms (ETSU-R-97)" ie, the procedure based on the Joint Nordic Method.

Where the tone level above audibility is greater than 2dB a tonal penalty shall be applied to permitted noise levels, in accordance with Figure 16 of the above document, so that the permitted levels specified at condition 6.22 above shall be reduced by the tonal penalty.

Noise Impact Assessment Criteria

13.3.40 As discussed at section above, ETSU-R-97 indicates that if operational noise from the wind turbines does not exceed the simplified noise limit of 35 dB L_{A90} at any neighbouring dwelling over all wind speeds and directions, then no further assessment, including baseline noise measurements, is required. As also noted above, this simplified limit applies to the cumulative noise from all installed and proposed wind turbines.

13.3.41 If operational noise levels from one wind farm are 10 dB below another, their contribution to the overall noise level is negligible. The noise impact from the Paul's Hill II wind turbines can, therefore, be considered negligible if predicted levels are below 25 dB L_{A90} at any receptor location, irrespective of existing levels of wind farm noise, as this is 10 dB below the ETSU-R-97 simplified noise limit, and therefore no further assessment would be required.

13.3.42 These are the criteria that the proposed development has been assessed against as well as a cumulative limit of 35 dB L_{A90}, being the limit that has been applied to the operational Paul's Hill and Berry Burn wind farms.

13.3.43 For construction noise of a duration of one month or longer, as construction activities will be undertaken during the daytime, the adopted criterion is 65 dB L_{Aeq}, and if noise levels from predicted construction activities are below this then no significant noise impacts are predicted. Where construction activities have a duration of less than one month, noise levels above 65 dB L_{Aeq} are considered to be acceptable as long as mitigation is implemented to reduce the impact as much as practicable.

13.3.44 In respect of road traffic noise, a doubling of road traffic would see a 3 dB increase in noise level at receptor locations, and it is considered that if road traffic noise increases during the construction phase are below 3 dB then no significant impacts are predicted. There will be no significant noise impacts from road traffic noise during the operational phase of the wind farm.

Predictions

Operational Noise Predictions

13.3.45 Operational noise predictions have been carried out using International Standard ISO 9613, *Acoustics - Attenuation of Sound during Propagation Outdoors*[30]. The propagation model described in Part 2 of this standard provides for the prediction of sound pressure levels based on either short-term downwind (i.e. worst case) conditions or long term overall averages. When the wind is blowing in the opposite direction, noise levels may be significantly lower, especially if there is any shielding between the site and the houses. Only the 'worst case' downwind short-term predictions are carried out here, such that the long term average predicted noise levels would be lower.

[27] Institute of Acoustics, Acoustics Bulletin, *A Planning Condition for Wind Turbines*, (page 56), Vol 42 No 6 November/December 2017

[28] British Standards Institution (BSI), 2008. BS 5228:2009, Noise and Vibration Control on Construction and Open Sites

[29] Department of the Environment, Environment Advisory Leaflet (AL) 72, Noise Control On Building Sites, 1969

[30] ISO 9613-2, Acoustics - Attenuation of Sound During Propagation Outdoors, Part 2: General Method of Calculation, International Organization for Standardization, 1996

13.3.46 The GPG suggests that ISO 9613-2 can be applied to obtain realistic predictions of noise from on-shore wind turbines during worst case propagation conditions, provided that the appropriate choice of input parameters are made.

13.3.47 The ISO 9613-2 standard is used for predicting sound pressure level by taking the source sound power level for each turbine in separate octave bands and subtracting a number of attenuation factors according to the following:

- Predicted Octave Band Noise Level = $L_w + D - A_{geo} - A_{atm} - A_{gr} - A_{bar} - A_{misc}$

13.3.48 These factors are discussed in detail below. The predicted octave band levels from each turbine are summed together to give the overall 'A' weighted predicted sound level.

L_w - Source Sound Power Level

13.3.49 The sound power level of a noise source is normally expressed in dB re: 1pW. Noise predictions are based on sound power levels detailed in Table 13.8. It should be noted that the actual make and model of the turbine to be installed at the Paul's Hill II wind farm is not yet known, but an assumed candidate turbine, the Senvion 3.2M114 has been assumed for the purposes of this assessment.

Table 13.8 – Wind Turbine Sound Power Levels (dB LWA)

Wind Farm and Turbine Type	Standardised[31] 10 m Height Wind Speed (ms^{-1})								
	4	5	6	7	8	9	10	11	12
Paul's Hill II Senvion 3.2M114	100.4	104.5	107.0	107.2	107.2	107.2	107.2	107.2	107.2
Paul's Hill Siemens SWT-2.3-82	91.9	96.6	102.3	104.2	104.5	104.9	104.9	104.9	104.9
Berry Burn Enercon E70 E4 2.3	-	-	101.2	103.6	105.1	105.6	105.9	105.9	105.9

13.3.50 The overall sound power levels have had an appropriate amount of uncertainty added, depending on the data supplied or available. Warranted data, or data that is likely to be warranted, has 2 dB uncertainly added to the stated levels, measured data has 2.6 dB added to it, unverified data (i.e. not warranted or no measurement reports) has 3 dB added, and if 3 measurement reports are available, the declared apparent sound power level has been calculated from the results of the reports. In this case the Senvion 3.2M114 data is understood to be guaranteed, the Siemens SWT-2.3-82 is based on one measurement report, and the Enercon E70 E4 2.3 MW declared sound power levels were calculated from 3 measurement reports.

13.3.51 The octave band noise spectra used for the predictions have been taken from the technical specifications for the turbine, in each case, with the results shown in Table 13.9.

Table 13.9 – Wind Turbine Octave Band Levels (dBA)

	Octave Band Centre Frequency (Hz)							
Turbine Type	63	125	250	500	1k	2k	4k	8k
Senvion 3.2M114	86.4	95.6	100.1	102.3	101.7	97.4	89.0	73.3
Siemens SWT-2.3-82	78.2	88.2	96.9	99.0	99.3	96.7	94.8	89.0
Enercon E70 E4 2.3	89.8	98.4	100.9	99.5	98.0	94.7	87.8	80.2

D – Directivity Factor

13.3.52 The directivity factor allows for an adjustment to be made where the sound radiated in the direction of interest is higher than that for which the sound power level is specified. For wind turbines, the sound power level is measured in a down wind direction, corresponding to the worst case propagation conditions considered here and needs no further adjustment.

A_{geo} – Geometrical Divergence

13.3.53 The geometrical divergence accounts for spherical spreading in the free-field from a point sound source, resulting in an attenuation depending on distance according to:

Ageo = 20 x log(d) + 11

where d = distance from the turbine

The wind turbine may be considered as a point source beyond distances corresponding to one rotor diameter.

A_{atm} - Atmospheric Absorption

13.3.54 Sound propagation through the atmosphere is attenuated by the conversion of the sound energy into heat. This attenuation is dependent on the temperature and relative humidity of the air through which the sound is travelling and is frequency dependent with increasing attenuation towards higher frequencies. The attenuation depends on distance according to:

Aatm = d x α

where d = distance from the turbine

α = atmospheric absorption coefficient in dB/m

13.3.55 Values of 'α' from ISO 9613 Part 1 corresponding to a temperature of 10ºC and a relative humidity of 70% has been used. These are the values specified in the IoA GPG. These give relatively low levels of atmospheric attenuation and correspondingly conservative noise predictions, and the values were used are given below.

Table 13.10 – Frequency dependent atmospheric absorption coefficients

Octave Band Centre Frequency (Hz)	63	125	250	500	1k	2k	4k	8k
Atmospheric Absorption Coefficient (dB/m)	0.000122	0.00041	0.00104	0.00193	0.0037	0.00966	0.0328	0.117

A_{gr} - Ground Effect

13.3.56 Ground effect is the interference of sound reflected by the ground with the sound propagating directly from source to receiver. The prediction of ground effects are inherently complex and depend on the source height, receiver height, propagation height between the source and receiver and the ground conditions. The ground conditions are described according to a variable G which varies between 0 for 'hard' ground (including paving, water, ice, concrete

[31] Standardised – Hub height wind speed corrected to 10 m using a logarithmic wind shear profile and a ground roughness length of 0.05 m.

& any sites with low porosity) and 1 for 'soft' ground (includes ground covered by grass, trees or other vegetation). The IoA GPG states that where wind turbine source noise data includes a suitable allowance for uncertainty, as is the case here, a ground factor of G = 0.5 and a receptor height of 4 m should be used.

A_{bar} - Barrier Attenuation

13.3.57 The effect of any barrier between the noise source and the receiver position is that noise will be reduced according to the relative heights of the source, receiver and barrier and the frequency spectrum of the noise. The barrier attenuations predicted by the ISO 9613 model have, however, been shown to be significantly greater than that measured in practice under downwind conditions. The IOA GPG states that an attenuation of just 2 dB(A) should be allowed where the direct line of site between the source and receiver is just interrupted. For these predictions no barriers have been included to ensure that the results can be considered to be conservative.

A_{misc} – Miscellaneous Other Effects

13.3.58 ISO 9613 includes effects of propagation through foliage, industrial plants and housing as additional attenuation effects. These have not been included here and any such effects are unlikely to significantly reduce noise levels below those predicted.

Concave Valley

13.3.59 The IOA GPG states that sound propagation across a concave ground profile, for example valleys or where the ground falls away significantly between the turbine and the receptor should incur an additional correction of +3 dB(A) to the overall A-weighted noise levels. This correction is implemented in order to take account of the reduced ground effects and, under some rare circumstances, the potential for multiple reflection paths caused by the concave profile.

13.3.60 A condition is recommended in the IOA GPG for indicating where this correction should be applied:

$$h_m \geq 1.5 \times \left(\frac{abs(h_s - h_r)}{2}\right)$$

13.3.61 where h_m is the mean height above ground along the direct path between the source and the receptor, h_s is the absolute source height above ground level and h_r is the absolute receptor height above ground level.

13.3.62 Whilst this condition is useful at highlighting where the ground profile beneath a source to receptor path may be concave, it is inherently non-robust and can produce false positives. It should therefore be used in conjunction with a visual assessment of the ground profile when determining whether a correction should be applied.

13.3.63 A computer program has been used to generate the ground profiles beneath each source – receptor path. From these plots it is possible to determine where a correction is appropriate. In this case there are no significant concave ground profiles between any turbines and receptor locations that would require a correction, although there are a number of instances where the criterion described above is exceeded.

Tonality

13.3.64 The ETSU-R-97 noise limits assume that the wind turbine noise contains no audible tones. Where tones are present, a correction should be added to the measured or predicted noise level before comparison with the recommended limits. The audibility of any tones can be assessed by comparing the narrow band level of such tones with the masking level contained in a band of frequencies around the tone called the critical band. The ETSU-R-97 recommendations suggest a tone correction, which depends on the amount by which the tone exceeds the audibility threshold. It has been assumed that the existing turbines do not exhibit tonal noise that would require a penalty under ETSU-R-97 or their planning conditions. No tonal penalties have been added to the Paul's Hill II predicted noise levels and it is recommended that a warranty is sought from the supplier of turbines for this site to ensure that no tonal penalty site would be required in practice.

Prediction Results

13.3.65 The nearest residential receptors to the wind farms have been identified, and the predicted noise levels for Paul's Hill II, as well as the cumulative overall predicted noise levels, have been calculated for each location for a standardised 10 m height wind speed of 10 m/s. The noise sensitive receptors identified are shown at Table 13.11 below together with the predicted operational noise levels. Under non-downwind propagation conditions and, at lower wind speeds, when the rotational speed of the turbines is slower, the predicted noise levels would be lower. The results are also shown graphically at Figure 13.1 and 13.2 where the results are plotted in the form of noise contours for Paul's Hill II alone and cumulatively with Paul's Hill and Berry Burn respectively.

13.3.66 It should be noted that the results are only included for locations where the predicted noise levels from the Paul's Hill II turbines exceed 25 dB L_{A90}, because the contribution from the proposed turbines to potential cumulative wind farm noise levels can be considered to be insignificant if predicted noise levels are below this.

Table 13.11 – Receptor Coordinates and Predicted Operational Noise Levels

			Predicted Operational Noise Levels (dB L_{A90})			
Location	Easting	Northing	Total Cumulative	Paul's Hill II	Paul's Hill	Berry Burn
Corglass Farm	315385	841833	35	34	28	24
Glenarder	316383	841592	31	28	25	22
Leakin	316234	842268	31	29	25	23
Upper Knockans	316266	843261	30	27	24	23
Garlinemore	317094	842041	28	26	23	22
Garlinebeg	317085	841769	29	26	23	21
Tomintuigle	317114	841259	28	26	23	21
Knockhourn	316995	842777	28	25	22	22
Rinour	317077	840740	28	26	23	21

The results presented at Table 13.11 show that 'worst case' (i.e. downwind then the turbines are operating at full power) predicted cumulative noise levels at the nearest residential property are 35 dB L_{A90}, and significantly lower at more distant residential locations.

Construction Noise Predictions

13.3.67 Detailed construction noise predictions have not been carried out here due to the large separation distances between on-site construction activities and sensitive residential receptors. However, it is highly likely that on-site track construction that is further than 200 m from residential properties would be below the 65 dB L_{Aeq} criterion. There is no on-site track construction proposed within 200 m of residential properties. All other on-site construction activities are likely to be less noisy.

13.3.68 It is likely that blasting will be required at one or both of the proposed borrow pit locations to extract rock. It is not possible to carry out meaningful predictions as the frequency, duration and noise levels from blasting at this very much depends on the type of rock, depth of charge and surrounding ground conditions onsite, together with the amount of rock that is required.

13.3.69 Where highways and cabling works are required along the route to the grid connection point, noise may be generated at times that is above the 65 dB L_{Aeq} adopted criterion, although the duration of the works is likely to be

relatively short (i.e. less than one month). Specific predictions of likely noise levels have not been carried out as the likely noise levels are dependent on the specifics of the works required which are not known at this stage.

13.3.70 Detailed road traffic noise predictions have been undertaken by calculating the increase in noise levels generated by the construction traffic along the delivery route. Predictions were undertaken using *The Calculation of Road Traffic Noise*[32] (CRTN), and the predicted daily traffic increases detailed at Tables 12.11 and 12.13 of the Traffic and Transport Assessment, in Chapter 12 of the ES. The predicted increase in noise level was calculated for months 4 and 5 and month 7 separately.

13.3.71 Noise predictions have not been undertaken for decommissioning activities, but the large separation distance between breaking up of the concrete foundations (likely to be the noisiest activity) and residential properties would result in noise levels at residential properties that are likely to be significantly below the adopted construction noise limit.

Assessment of Impacts

Operational Noise Assessment

13.3.72 The results of the predictions at Table 13.11 show that cumulative predicted noise levels at the nearest residential receptors to the proposed Paul's Hill II wind farm do not exceed 35 dB L_{A90} and therefore meet the ETSU-R-97 simplified noise limit discussed at section 13.4.14 to 13.5.26, and the cumulative operational noise impact can be considered to be not significant.

13.3.73 In addition, predicted noise levels from the operational Berry Burn wind farm are below 25 dB L_{A90} at the nearest residential properties to Paul's Hill and Paul's Hill II wind farms, and therefore the contribution from Berry Burn to the overall noise levels can be considered to be insignificant and therefore does not require further assessment.

Noise Limits for Paul's Hill II

13.3.74 The operational Paul's Hill wind farm is already consented to operate at up to 35 dB L_{A90} at the nearest noise sensitive premises, (although the maximum predicted noise level at the nearest property is 28 dB L_{A90}). Therefore, in theory, if it were to operate at this level at the nearest property, any additional turbines with a predicted noise level of 25 dB L_{A90} or greater would cause predicted cumulative noise levels above 35 dB L_{A90}. However, it can be seen at Table 13.11 that predicted operational noise levels for the Paul's Hill wind farm are significantly below its consented noise limit. In this case, as the proposed extension would be owned and operated by the same company a cumulative noise limit of 35 dB L_{A90} could be applied to Paul's Hill and Paul's Hill II wind farms acting together as long as this continued to be the case.

13.3.75 Alternatively, a stand-alone noise limit could be applied to Paul's Hill II wind farm which would in theory allow cumulative operational noise levels above that from the already consented Paul's Hill wind farm, but could be deemed to be acceptable. For example if Paul's Hill II is set a noise limit of 35 dB L_{A90} then in theory overall noise levels from Paul's Hill and Paul's Hill II could be 38 dB L_{A90} which is still below the ETSU-R-97 upper daytime and night noise limits (irrespective of background noise level). In any case, if Paul's Hill II was consented at 35 dB L_{A90} and Paul's Hill operates at its predicted noise levels, the maximum operational noise level at the nearest residential property would be less than 35 dB L_{A90}. In this case it is considered that applying a noise limit to Paul's Hill II wind farm of 35 dB L_{A90} would ensure that operational noise levels from both Paul's Hill and Paul's Hill II are acceptable.

Construction Noise Assessment

13.3.76 As discussed at section 13.4.33 to 13.4.35, detailed construction predictions have not been undertaken due to the large separation distances between construction activities and residential properties.

13.3.77 Noise from on-site construction activities are likely to be significantly below the 65 dB L_{Aeq} criterion, and it can therefore be concluded that noise impact from on-site construction activities will be not significant.

13.3.78 An additional construction noise impact would be blasting associated with the proposed borrow pit in order to obtain materials for the construction of turbine bases and the onsite access road. This type of noise does not typically fall within the assessment of normal construction noise because of the extremely high amplitude and impulsive nature of the waveform. It is very likely that blasting noise could be heard at nearby residential locations but a construction noise assessment would average noise levels across the day and is therefore not applicable to use for the assessment of blasting noise impacts. Mitigation to reduce the noise impact from blasting activities is set out in section 13.5.87, and with the mitigation implemented, noise from blasting activities is considered to be not significant.

13.3.79 Where highways upgrades and cabling between the site and grid connection is carried out close to residential properties, there may be temporary short term noise impacts, with the level of impact dependant on the specific work required. It is likely, however, that noisy activities near residential properties will generally continue for a duration of less than one month, and therefore this short term noise impact can be considered to be not significant.

Road Traffic Noise

13.3.80 It was confirmed via the Scoping Opinion (see Appendix 1.2) that Transport Scotland does not require a noise assessment of construction traffic noise in this ES. Nevertheless, predictions have been undertaken using the predicted increases in road traffic during the most intensive phase of construction detailed at Tables 12.11 and 12.13 of the Traffic and Transport Assessment, in Chapter 12 of the ES. The results of the predictions for months 4 and 5 and month 7 are detailed below at Table 13.12 and Table 13.13 respectively.

Table 13.12 – Road Traffic Predicted Increase in Noise Levels (Months 4 and 5)

Location	Baseline Daily Traffic Flows		Baseline + Construction Traffic Flow		Predicted Relative Change in Traffic Noise Level (dB)	Significance of Impact
	Total Traffic Flow	Total HGV	Total Traffic Flow	Total HGV		
A	300	42 (14%)	331	53 (16%)	0.8	Not significant
B	377	73 (19%)	408	84 (21%)	0.5	Not significant
C	226	25 (11%)	246	25 (10%)	0.2	Not significant
1055	3277	469 (14%)	3308	480 (15%)	0.1	Not significant
74436	6986	685 (10%)	7017	696 (10%)	0.0	Not significant
20985	6208	685 (11%)	6239	696 (11%)	0.0	Not significant
30867	2740	409 (15%)	2771	420 (15%)	0.1	Not significant

Table 13.13 – Road Traffic Predicted Increase in Noise Levels (Month 7)

Location	Baseline Daily Traffic Flows		Baseline + Construction Traffic Flow		Predicted Relative Change in Traffic Noise Level (dB)	Significance of Impact
	Total Traffic Flow	Total HGV	Total Traffic Flow	Total HGV		
A	300	42 (14%)	326	64 (20%)	1.3	Not significant
B	377	73 (19%)	403	95 (24%)	0.9	Not significant

[32] Calculation of Road Traffic Noise, Department of Transport, Welsh Office, HMSO 1988

Location	Baseline Daily Traffic Flows		Baseline + Construction Traffic Flow		Predicted Relative Change in Traffic Noise Level (dB)	Significance of Impact
	Total Traffic Flow	Total HGV	Total Traffic Flow	Total HGV		
C	226	25 (11%)	230	25 (11%)	0.0	Not significant
1055	3277	469 (14%)	3303	491 (15%)	0.1	Not significant
74436	6986	685 (10%)	7012	707 (10%)	0.1	Not significant
20985	6208	685 (11%)	6234	707 (11%)	0.1	Not significant
30867	2740	409 (15%)	2766	431 (16%)	0.2	Not significant

The results show that no significant noise impacts at receptor locations from vehicular traffic accessing the site are predicted.

Decommissioning Noise

13.3.81 No significant decommissioning noise effects are predicted, although it should be noted that noise from decommissioning activities would be controlled as required by the guidance prevalent at the time.

Mitigation

Operational Mitigation

13.3.82 No specific operational mitigation is required as the relevant noise limits are met. It should be noted that noise reduced modes of operation are generally available for wind turbines of the scale proposed here that allow noise levels to be reduced by restricting the rotational speed of the machines. This mitigation could be employed if any noise issues arise that would require mitigation to be implemented.

13.3.83 As no operation mitigation is required and noise limits are met planning condition 7.8 of the Paul's Hill I consent is potentially suitable for the proposed development.

Construction Noise Embedded Mitigation

13.3.84 Noise during construction works would be controlled by generally restricting works to standard working hours and exclude Sundays, unless specifically agreed otherwise. A similar planning condition to that applied for Paul's Hill Wind Farm could be applied.

13.3.85 BS 5228 states that the 'attitude of the contractor' is important in minimising the likelihood of complaints and therefore consultation with the local authority would be required along with providing information to residents on intended activity.

13.3.86 The construction and decommissioning works on-site would be carried out in accordance with:

- relevant EU Directives and UK Statutory Instruments that limit noise emissions from a variety of construction plant;
- the guidance set out in PAN1/2011 and BS5228: 2009; and
- Section 61 of the Control of Pollution Act 1974 and Section 80 of the Environmental Protection Act.

Where construction activities relating to highways improvements or cabling for the grid connection are within 200m of a residential property, contractors would be required to assess noise impacts during the construction phase and a noise control plan would be produced that includes:

- procedures for ensuring compliance with statutory or other identified noise control limits;
- procedures for minimising noise from construction related traffic on the existing road network;
- procedures for ensuring that all works are carried out in accordance with the principle of "Best Practicable Means" as defined in the Control of Pollution Act 1974;
- general induction training for site operatives, and specific training for staff having responsibility for particular aspects of controlling noise from the site.

13.3.87 The most appropriate way to address blasting noise is through a condition requiring a pre-blasting noise management programme to be submitted and agreed in writing prior to any blasting operations taking place. This would identify the most sensitive receptors that could be potentially affected by blasting noise. The plan would contain details of the proposed frequency of blasting, and proposed monitoring procedures. The operator would inform the nearest residents of the proposed times of blasting and of any deviation from this programme in advance of the operations. The plan would also contain contact details which would be provided to local residents should concerns arise regarding construction and blasting activities. In addition, each blast will be designed carefully to maximise its efficiency and to reduce the transmission of noise.

13.3.88 A planning condition similar to 7.4 of the existing Paul's Hill planning conditions may well suffice in relation to the noise management caused by blasting

Decommissioning

13.3.89 Noise during decommissioning will be controlled through the relevant standards and best practice available at the time. Noise generation during decommissioning is likely to be similar to during construction and similar measures proposed for noise mitigation, essentially management controls to ensure excessive noise is not generated, would be employed.

Conclusions

13.3.90 A noise assessment has been carried out for the proposed Paul's Hill II Wind Farm development by comparing predicted cumulative operational noise levels, including the operational Paul's Hill and Berry Burn wind farms, have been compared with the ETSU-R-97 simplified noise limit of 35 dB L_{A90}.

13.3.91 The results of the predictions show that cumulative predicted operational noise levels meet the ETSU-R-97 simplified noise limit, and therefore no significant operational noise impacts are predicted.

13.3.92 A construction noise assessment has been undertaken with reference to BS5288:2009, *Noise and Vibration Control on Construction and Open Sites*, which indicates that noise from construction activities will be significantly below the adopted daytime noise limit of 65 dB L_{Aeq}, and therefore no significant construction noise impacts are predicted. Noise associated with off-site highways improvements and cabling requirements to the grid connections is not significant due to the relatively short term impacts. Mitigation will be implemented such that, although blasting activities may be detected at residential properties, the impact is not significant.

13.3.93 No significant impacts are predicted for road traffic noise generated by construction traffic accessing the site during the construction phase of the development.

13.4 ICE THROW

13.4.1 This section will describe ice throw and consider its risk and mitigation in relation to the proposed development.

13.4.2 Blade icing is a rare occurrence that will only happen when the blades of the turbine are stationary and under near freezing temperatures and relatively high humidity, with either freezing rain or sleet. If these certain climatic conditions cause icing to occur, once operation recommences, the operational motion of the turbine blades and the forces of gravity can cause the ice to break off and fall vertically to the ground.

13.4.3 The risk of ice throw[33] is dependent on the local climate and weather conditions in which the wind turbines are situated. Increases in temperature, wind speed and solar radiation can cause the ice to loosen and fall. This makes the area under the turbine the area of the greatest risk. Dependent on the conditions, there is the potential for the blades to propel the ice up to several hundred meters when they commence operation. This can cause damage to people, structures and vehicles.

13.4.4 Siting the turbines away from occupied buildings, roads and public areas can mitigate the risk. This is the case at the proposed Paul's Hill II Wind Farm development. There are specific sensors that can identify the likeliness of the climatic conditions that cause icing, so if ice accumulation is expected or occurs the turbines can be shut down. This works when icing on the blades results in reduced performance, unusual loads, and/or vibrations. These are then detected by a control system and trigger an automatic shutdown of the turbine. Project operators use these detection systems to halt operation of certain turbines during icing events to prevent ice throws and equipment damage and, in these cases, the turbine remains off-line until an operator visually inspects and manually restarts the turbine when the blades are clear of ice.

13.4.5 The overall view is that modern turbines which are fitted with climatic detection systems like the ones being considered for Paul's Hill II Wind Farm. As highlighted in section 4.22 in Chapter 4: Description of Development, turbine procurement together with good practice site management procedures including the use of visual warnings signs and restricted access to turbines where ice is present on blades, will mitigate and manage this potential hazard.

13.5 SHADOW FLICKER

13.5.1 Standard guidance[34] states that shadow flicker occurs within ten rotor diameters of the turbine, and that effects only occur within 130 degrees either side of north relative to the turbines. Beyond these limits it is considered that potential impacts associated with shadow flicker will not be significant.

13.5.2 As there are currently no residential properties identified within 10 rotor diameters of the nearest turbines there is no need to undertake an assessment within this ES.

13.6 OVERALL CONCLUSION

13.6.1 This Human Health and Population chapter has considered a wide range of issues and potential impacts associated with the proposed Paul's Hill II Wind Farm development. These subject areas have included the socioeconomic context, noise, ice throw and shadow flicker. Other potential impacts on human health and population that have not been included in this chapter are considered in other parts of the ES. The potential impact on private water supplies is considered in Chapter 10: Hydrology, Geology and Hydrogeology and the potential impact on visual amenity is considered in Chapter 6: Landscape and Visual.

13.6.2 In relation to the socioeconomic impact it is considered that the proposed development has the potential to create positive socioeconomic impacts locally, regionally and nationally. As with the existing Paul's Hill Wind Farm, the proposed development also has the potential to coexist with its neighbouring properties and settlements and create positive community and economic benefits for the local area and beyond.

13.6.3 In relation to the noise assessment the results show that the proposed Paul's Hill II Wind Farm on its own, and the cumulative predicted operational noise levels meet the ETSU-R-97 simplified noise limit, and therefore no significant operational noise impacts are predicted.

13.6.1 The noise assessment also indicates that with the implementation of appropriate embedded mitigation measures during construction there should be no significant construction noise impacts predicted, and there should also be no significant noise impacts predicted related to road traffic noise generated by construction traffic accessing the site during the construction phase of the development.

13.6.2 In terms of the potential impact of ice throw it is considered that turbine procurement together with good practice site management procedures including the use of visual warnings signs and restricted access to turbines where ice is present on blades there will be no significant impact for the public or for site workers using the site.

13.6.3 In relation to shadow flicker, as there are currently no residential properties identified within 10 rotor diameters of the nearest turbines there has been no need to undertake an assessment within this ES.

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[33] Evaluating risk caused by ice throw from wind turbines (2017) Available: http://www.lr.org/en/news-and-insight/articles/evaluating-risk-caused-by-ice-throw-from-wind-turbines.aspx (accessed 24/01/2018)

[34] http://www.scotland.gov.uk/Resource/0040/00405870.pdf

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Chapter 14

Summary and Residual Effects including Mitigation

Contents

Glossary

Term	Definition
Environmental Impact Assessment	Environmental Impact Assessment (EIA) is a means of drawing together, in a systematic way, an assessment of the likely significant environmental affects arising from a proposed development
Environmental Statement	A document reporting the findings of the EIA and produced in accordance with the EIA Regulations
The Existing Paul's Hill Wind Farm	The 'existing Paul's Hill Wind Farm' refers to the operational Paul's Hill Wind Farm.
The Proposed Development	The proposed Paul's Hill II Wind Farm
The Proposed Development Area	Red line boundary (application area)

List of Abbreviations

Abbreviation	Description
AGLV	Area of Great Landscape Value
ATC	Air Traffic Control
CMS	Construction Method Statement
CNP	Cairngorms National Park
DIO	Defence Infrastructure Organisation
ECoW	Ecological Clerk of Work
EIA	Environmental Impact Assessment
ES	Environmental Statement
GWDTE	Ground Water Dependent Terrestrial Ecosystem
HMA	Heather Management Area
HMP	Habitat Management Plan
IEF	Important Ecological Feature
IOF	Important Ornithological Feature
JRC	Joint Radio Company
LSE	Likely Significant Effect
MOD	Ministry of Defence
NSA	National Scenic Area
OMP	Ornithological Management Plan
SAC	Special Area of Conservation
SLA	Special Landscape Area
SPP	Species Protection Plan
WFD	Water Framework Directive
WLA	Wild Land Area

14.1 INTRODUCTION

14.1.1 This chapter summarises the findings of the Environmental Impact Assessment (EIA) presented in the Environmental Statement (ES) which was prepared in support of an application under Section 36 of the Electricity Act 1989 to construct and operate a wind farm comprising of up to 7 wind turbines on the hills of Carn na Dubh-chlais in Moray. The proposed development consists of 6 turbines of an overall height from base to tip not exceeding 149.9 m and 1 turbine with an overall height from base to tip not exceeding 134 m, external transformer housing, site tracks, crane pads, foundations, underground electricity cables, extension of use of consented operations and control building and temporary construction and storage compounds, 2 borrow pits, on-site concrete batching plant, associated works/infrastructure and Health and Safety sign posting.

14.2 OVERVIEW OF THE EIA PROCESS

14.2.1 Chapter 5: Approach to ES, sets out in detail the methodology used to progress the EIA for the proposed development. As well as addressing the legal requirements set out in the relevant statutory documents notably the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000 as amended by the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2008 (the EIA Regulations), the EIA has also followed an iterative design process involving successive rounds of consultation with both statutory consultees and other stakeholders. A summary of the process and the residual effects identified in each section of the ES are set out in the remainder of this chapter.

14.3 SCOPING OF THE EIA

14.3.1 A scoping report was issued to an agreed list of consultees in May 2017 and formal consultation responses received between May 2017 and August 2017. The responses and recommendations from consultees were then taken into account throughout the EIA. The scoping responses are detailed in Table 3.1 within Chapter 3: Site Selection and Evolution, of the ES. Throughout the EIA process, consultations with relevant bodies have been undertaken. This has ensured that all bodies, where necessary, have been kept informed about the process throughout the entire assessment.

14.4 GATHERING OF EXISTING DATA

14.4.1 Feasibility studies were carried out to determine the viability of the site to host a wind farm and such data helped to inform the EIA process.

14.4.2 Existing data sources which were relevant to each topic were identified and reviewed to help inform the survey requirements. The existing data sources provided a valuable initial stage assessment to inform assessment methodologies and requirements.

14.5 ITERATIVE DESIGN PROCESS

14.5.1 In designing the final layout of the proposed development, the ES shows how the applicant has taken into consideration the environmental resources in and around the site and has sought to ensure that the impacts and effects of the proposed development on these are minimised. This has been an iterative process, taking into account scoping responses, data searches, assessments as they progressed, and consultations with relevant statutory organisations. The design strategy for the key elements of the proposed development has taken into account the following objectives:

- To provide a turbine layout with simple form, which relates to the landscape character of the site and its surroundings;
- To create a turbine layout which reflects the scale of the landscape in which it is located;
- To avoid an overly complex and visually confusing layout;

- To achieve a balanced composition of the turbines against the landscape and skyline from key view point locations;
- To reflect the pattern of nearby existing wind farms; and
- To maximise site efficiency and electricity production targets.

3.1.1 In addition, the following principles have been taken into account in order to ensure that the proposed development best meets the objectives detailed above whilst maximising the efficiency of the proposed development:

- Larger turbines (compared to the existing turbines at Paul's Hill) have been selectively used in areas of lower ground levels and contained visibility, meaning larger turbines can be accommodated more easily;
- Noting the current economic climate which is pushing for greater efficiency in electrical generation, turbines of 149.9 m to tip height are considered within the design of the proposed development and are proposed within the final design. Turbines with larger rotors are capable of significantly increasing the total output therefore maximising the chances of the development being realised if planning can be secured. In addition, the land take of the proposed development is reduced as fewer turbines are required to generate a greater total output than turbines with lower tip heights; this also reduces the environmental impacts and the carbon footprint of the proposed development; and
- Noting that the site is within a search for large typology wind turbines area (as defined in the adopted LDP as turbines greater than 80 m), the principle of turbines within the proposed development area is already accepted. Our design therefore allows the potential of this search area to be maximised.

14.5.2 Key objectives adopted for the proposed development specific to the Landscape and Visual Assessment are discussed in Chapter 6: Landscape and Visual Assessment.

14.5.3 The final layout therefore represents a technically acceptable and commercially viable development. It is considered that the layout, turbine sizes and number are appropriate to the scale and landform of the proposed development area with the proposed development being the end result of a sensitive, well thought out design process whose goal was to provide the optimum balance between clean energy production, technical constraints and environmental considerations.

14.6 SUMMARY OF ASSESSMENTS

14.6.1 Baseline surveys were carried out by specialist consultants in a number of different study areas. This allowed sufficient data to be collected and analysed to form an accurate account of the current status of environmental and human elements in the vicinity of the proposed development. It is proposed that for any data gaps that exist, further survey will be completed prior to construction, as required.

14.6.2 The prediction of the potential effects from the proposed development and any mitigation measures were then considered to ensure that the proposed development has the least impact possible.

14.6.3 Baseline survey methodologies and coverage are described in detail in the relevant assessments in the chapters of this ES. A summary of the findings of each assessment are provided in the sections below.

14.7 LANDSCAPE AND VISUAL

14.7.1 This Landscape and Visual Impact Assessment (LVIA) Chapter provides a comprehensive but focussed assessment of the likely significant effects of the proposed Paul's Hill II Wind Farm on the landscape resource and visual amenity within an identified study area.

14.7.2 The design process began with a layout responding mainly to wind resource and wind turbine specification which took into account operational turbines on the adjacent existing Pauls Hill Wind Farm development and initial considerations of the capacity of the landform of the Paul's Hill II development area. From this starting point, turbines were relocated, modified or removed from the layout due to physical constraints, such as watercourses, areas of deep peat and steep slopes and took into account sensitive wildlife habitats and species locations and visual and landform sensitivities. The proposed layout is considered to be a well balanced design from key viewpoints and receptors whilst also giving due consideration to constraints, such as ornithological receptors As discussed in Chapter 8: Ornithology, the primary locations of hen harrier activity has been a major factor in the proximity of turbines to the south of the development, for example.

14.7.3 In relation to potential significant impacts on Landscape Character Types (LCT's), one of these is Landscape Character Type 11 (LCT 11), which is assessed to experience a significant effect during the construction phase only. Following post-construction reinstatement this temporary moderate effect is reduced to minor/moderate and therefore not significant. The other potential significant effect identified is that upon LCT 7 which has been identified as potentially experiencing moderate/major and therefore significant landscape and cumulative effects for cumulative baseline 1 (operational wind farm developments). However due to mitigating factors, such as the operational developments will generally be experienced at the same time as the proposed development and the landmark feature of Roy's Hill is not the only key landmark hill within the LCT, it is considered that this potential significant effect is not unacceptable.

14.7.4 No Significant landscape effects are considered to occur from any of the three assessed landscape designations within the study area. Moderate and Not Significant levels of landscape effect have been considered for the Cairngorms National Park, The Cairngorm Mountains NSA and the Cairngorms WLA which were included in the initial assessment for significant effects within the Scoping report. Also, no significant levels of landscape effect have been considered for the Drynachan, Lochindorb and Dava Moors SLA and the Spey Valley AGLV. These not significant effects arise from limited magnitude of landscape change from the CNP and from medium levels of sensitivity combined with moderate levels of landscape change for the two local landscape designations.

14.7.5 No unacceptable visual significant effects are predicted to be experienced by visual receptors at any of the selected viewpoints. One out of the ten selected viewpoints has been identified as potentially experiencing ***Moderate*** and ***Significant*** (although considered acceptable) visual and cumulative effects for cumulative baseline 1 (operational wind farm developments): Viewpoint 1, taken from the frontage of Tormore Distillery as this is in close proximity to the viewpoint at 5.9 km from the proposed development. A further seven of the remaining nine viewpoints were considered to experience a ***Moderate*** and **Not Significant** level of effect. The remaining two viewpoints are considered to experience ***Minor/Moderate*** and **Not Significant** level of effect**.**

14.7.6 In relation to individual residential receptors, there were two significant effects and one borderline significant effect identified from the three individual and isolated properties within 3 km of the proposed development. However screening (e.g. from topography and/or trees), the carefully designed layout and the localised nature of these effects mitigate these effects which are assessed as not significantly affecting the overall visual component of living conditions for any of these three properties. These effects are therefore considered acceptable in landscape and visual terms.

14.7.7 No significant visual effects have been identified from any of the four assessed settlements; Archiestown. Upper Knockando, Craigellachie and Dallas.

14.7.8 Four sequential routes have been identified as experiencing ***Moderate*** levels of sequential visual effect. These include the A95 main route along the Spey Valley, the B970 from Grantown to Aviemore and beyond the study area, the Speyside Way long distance footpath from Buckie to Aviemore and beyond the study area, and Core Path SP20. These moderate sequential effects are considered to be ***Not Significant*** owing to the highly localised nature and restricted actual visibility along all four routes.

14.7.9 Mitigation for Landscape and Visual Effects is in the form of embedded mitigation. We consider that the proposed development has followed SNH guidance in this regard and that the design a wind farm relates directly to the qualities of the site and contains design elements that minimise the effects as far as is practical.

14.8 ECOLOGY

14.8.1 The Ecology Chapter provides an overview of baseline ecological conditions within the Paul's Hill II Development Area and immediate surrounding environment. The potential ecological effects of the proposed wind farm development during construction, operation and decommissioning are identified, assessed and evaluated in terms of their significance, in accordance with industry guidelines. Cumulative impacts at an appropriate biogeographic scale are described and an assessment of residual impacts, taking into consideration proposed mitigation measures, is also provided.

14.8.2 It is expected that embedded mitigation measures will protect potentially highly dependent GWDTEs during the construction phase of Paul's Hill II Wind Farm, as required by the WFD. By applying effective embedded mitigation measures, mainly through the design process and following best practice guidelines during construction, the magnitude of residual effects has been reduced to negligible for all IEFs and highly dependent GWDTEs.

14.8.3 Adoption of similar habitat management measures to those already employed on the existing operational Paul's Hill Wind Farm provide an opportunity to continue to promote the current good practice for the duration of the proposed development.

14.8.4 In relation to cumulative impacts, there are not any IEFs for which a greater than negligible residual impact is predicted and hence, there is no real possibility of meaningful contribution to a cumulative impact with other relevant projects. Therefore, no further cumulative impact assessment has been undertaken for any of the IEFs.

14.8.5 In summary, by applying effective embedded mitigation measures, mainly through the design process, implementing the proposed fish monitoring programme and following best practice guidelines during construction including production of a Species Protection Plan (SPP), the magnitude of residual effects of Paul's Hill II Wind Farm are assessed as being reduced to **Negligible** in terms of magnitude, and thus **Not Significant** in terms of the EIA Regulations.

14.8.6 In relation to the Habitat Regulations Assessment (HRA) for the main wind farm site, with the successful implementation of all of the embedded mitigation it is concluded that potential effects for all qualifying features of the River Spey SAC will be reduced to **Negligible** and there will be **No Adverse Effect** resulting from this proposed wind farm development.

14.8.7 In relation to additional works that may be required along the access route (particularly in the vicinity of Blacksboat Bridge) these will have to be provided at a later stage. It is assumed for the purpose of determining this application that any such works will not have an adverse effect on the River Spey SAC. In general, it will be the aim to select turbine components and an appropriate mode of delivery that fits within the current parameters of the highway. Additional information on this matter will be provided as required to the planning authority and other stakeholders prior to construction.

14.9 ORNITHOLOGY

14.9.1 The Ornithology Chapter describes the ornithological interest at the proposed Paul's Hill II Wind Farm and assesses the predicted impacts of the proposed development on these interests. It details the methods used to identify the baseline bird community within the proposed Paul's Hill II Wind Farm development and surrounding locale, and the process used to determine the nature conservation value of the bird populations present. The chapter then sets out the potential effects of the proposed wind farm development on birds during construction, operation and decommissioning, and assesses the significance of potential impacts on bird populations, including cumulative impacts, at an appropriate bio-geographic scale.

14.9.2 The assessment identified no significant effects following embedded mitigation measures, of the proposed development on ornithological interests. Specific embedded mitigation measures for black grouse, hen harrier and merlin are proposed to minimise the potential effects of disturbance and/or displacement, and to ensure compliance with the Wildlife and Countryside Act (1981) as amended by the Nature Conservation (Scotland) Act (2004). A SPP is proposed and best practice guidance regarding breeding birds will be followed, with an ECoW employed during construction.

14.9.3 A HMP targeted at hen harrier and merlin is also proposed, incorporating an OMP to assess the efficacy of measures outlined in the HMP and species-specific embedded mitigation outlined for black grouse, hen harrier and merlin. It is considered that following the implementation of these species specific embedded mitigation measures there will be **No Significant Adverse Impacts** on the main target species associated with the proposed Paul's Hill II Wind Farm.

14.9.4 Furthermore, with the implementation of the proposed management and monitoring measures it is considered that there is the potential for beneficial effects in the medium to longer term, and a continuation of the successful management that has already taken place for the protection of hen harrier and other target species associated with the Paul's Hill consent.

14.10 CULTURAL HERITAGE

14.10.1 The Cultural Heritage chapter has considered the likely significant effects of the proposed Paul's Hill II Wind Farm development on cultural heritage (historic environment sites and features, archaeology and built heritage). The assessment has been carried out by CFA Archaeology Ltd (CFA) using information provided by Historic Environment Scotland (HES), the Aberdeenshire Council Archaeology Service (ACAS), on behalf of Moray Council, and the Highland Council Historic Environment Team (HCHET).

14.10.2 It is anticipated that no known heritage assets would be directly affected in the main wind farm area.

14.10.3 It is also anticipated that no known heritage assets would be directly affected by the proposed highways works or cabling works but there remains some limited possibility that those works could have an adverse effect on any unrecorded, buried archaeological remains present in affected areas. Any potential impact on heritage assets will be addressed once a turbine has been selected, the route has been fully assessed and engineering details are known and provided in the Construction Method Statement (CMS).

14.10.4 In terms of indirect impacts on the setting of cultural heritage assets (e.g. Ballindalloch Castle), the up-to-date data with statutory and non-statutory designations up to 10 km from the proposed wind farm development has been compared against the blade tip height ZTV for the proposed Paul's Hill II development and no heritage assets have been identified where potentially adverse impacts on their settings would arise. A detailed assessment has been undertaken of the potential impact on Ballindalloch Castle, Ballindalloch Dovecote and the castle grounds and no significant impact is predicted.

14.10.5 There is also considered to be no significant cumulative effect on the setting of any heritage assets.

14.10.6 As no significant direct or indirect impacts have been identified no mitigation is currently required. Whilst there is some potential for heritage assets to be impacted by highway works, it is considered that known heritage assets can be avoided.

14.11 HYDROLOGY, GEOLOGY AND HYDROGEOLOGY

14.11.1 This Hydrology, Geology and Hydrogeological Chapter of the Environmental Statement (ES) has assessed the impacts on the hydrological, geological and hydrogeological environment of the proposed Paul's Hill II Wind Farm development and the potential impacts resulting from the construction, operation and ultimate decommissioning of the proposed turbines and associated infrastructure.

14.11.2 The greatest risk of the proposed Paul's Hill II Wind Farm development affecting the hydrological, geological and hydrogeological environment will occur during the construction phase, with effects reduced during the operational and decommissioning phases.

14.11.3 Following the identification and assessment of the key receptors, taking into account the key potential effects, a comprehensive suite of embedded mitigation and best practice measures has been incorporated into the design,

including extensive buffer areas. In addition, a site specific CEMP as well as detailed design of infrastructure with associated embedded mitigation will be implemented to protect the groundwater and surface water resources from pollution and minimise changes to the hydrological environment.

14.11.4 The impact assessment has taken into account the hydrological regime, highlighting that the principal effects will occur during the construction. Assuming the successful design and implementation of embedded mitigation measures the significance of construction effects on all identified receptors is considered to be of **minor or no significance.** The assessment of predicted ongoing and operational effects has also determined that the significance of effects on all receptors to be of **minor/moderate minor or no significance**.

14.11.5 In relation to private water supplies, they are considered of utmost importance and will be protected from detrimental effects of the proposed wind farm development. At the current time the exact details of some works such as whether existing access track will require widening or the burial of the power cables is yet to be determined. However, should track widening works or excavation be undertaken adjacent to the existing access track, reassessment of the risk will be undertaken for Corglass Lodge & Corglass Beag.

14.11.6 The Private Water Supply Risk Assessment (Technical Appendix 10.7) identified a Medium/Low risk to Corglass Lodge, Corglass Beag (219) as a result of potential impact during planned resurfacing work to the existing access track. It is recommended that monitoring at both source and point of consumption is carried out during this upgrade work. Agreement with the property owner, monitoring frequency and parameters monitored would be agreed post consent. Monitoring regime would conform to the relevant guidance & best practice statements.

14.11.7 In relation to peat stability (see Appendix 10.2), the peat depths across the site are predominantly shallow (<1m). Due to a number of water courses across the development a Medium hazard ranking is indicated for infrastructure within 100m of water courses. However, it should be noted that these medium risk ratings are a consequence of the high exposure rating for these locations and are not a result of an increased risk of a peat landslide event occurring. Applied mitigations and appropriate control measures including best practice construction shall ensure the residual hazard rankings are insignificant across these areas.

14.11.8 In relation to peat management (see Appendix 10.3), the peat excavation volume calculation prediction for Paul's Hill II Wind Farm is approximately 30,899 m^3 . With this volume of peat excavated, this should be suitably accommodated in the estimated available capacity of 31,822 m^3. The management of peat across the site can be monitored to ensure that effects on the peat land environment are appropriately understood and subsequently reduced via the embedded mitigation measures proposed.

14.11.9 In relation to carbon balance (see Appendix 10.5), the results from the online carbon calculator show that the proposed wind farm development would have effectively paid back its expected carbon debt from manufacture, construction, impact on habitat and decommissioning within 2 years, if it replaced the fossil fuel electricity generation method. Based on the minimum and maximum scenarios however, the analysis indicates that the payback time for fossil fuel-mix generation ranges between 0.8 and 5.9 years. Overall, the carbon balance assessment reveals that the net impact of the proposed wind farm development at Paul's Hill II will be positive overall, as over the 35-year lifespan of the proposed wind farm development, and it is likely to generate over 29 years' worth of clean energy based on the maximum worst-case scenario. Assuming the expected 33 years that the wind farm is likely to be generating carbon-free electricity, this could result in expected CO_2 emission savings of over 835,000 tonnes of CO_2. This illustrates that the proposed wind farm development has the potential to contribute significantly towards the reduction of GHG emissions from energy production.

14.12 AVIATION AND EXISTING INFRASTRUCTURE

14.12.1 The Aviation and Existing infrastructure chapter of the ES has given consideration to the potential for impact upon civil aviation interests, Ministry of Defence (MoD) interests, communication operations and existing site infrastructure. The chapter assesses such potential impacts and demonstrates the consultation process undertaken, provides details of any impacts and outlines mitigation where it is deemed necessary.

14.12.2 In summary, the proposed development is likely to affect aviation interests and existing infrastructure. In terms of aviation interests, the wind turbines are likely to cause interference to both civil and military ATC radar located at Inverness Airport and RAF Lossiemouth respectively. In both cases, the applicant is in dialogue with the HIAL and the MoD to identify suitable mitigation solutions to reduce the impact to an acceptable level. Mitigation measures could be secured with appropriate planning conditions.

The proposed development also has the potential to cause interference to a communications link. A detailed assessment by JRC identified that it is only T7 that could potentially interfere with the link, and mitigation is possible. Potential mitigation measures include agreeing to a micro-siting restriction ensuring that the turbine position does not move closer to the link or upgrade of the antenna (if the former is not possible). Refer to the note from JRC for confirmation of the requirements of the link owner (see Technical Appendix 11.1). The mitigation could be secured through a planning condition.

14.12.3 In relation to existing infrastructure, it has been identified that there is existing infrastructure in the vicinity of the wind farm, access route and grid connection route. Suitable embedded mitigation will be taken to ensure that these assets are suitably protected throughout the delivery, construction and operation of the wind farm. Where mitigation is required detail will be provided in the CMS.

14.13 TRAFFIC AND TRANSPORT

14.13.1 The Traffic and Transport Chapter assesses the impacts due to transport and access for the proposed Paul's Hill II Wind Farm development resulting from the wind farm construction, operation and decommissioning of the development against a baseline condition built up from Automated Traffic Counts commissioned for this project and Department for Transport data of traffic flows on the roads network.

14.13.2 Traffic generated by the wind farm proposal would be concentrated during the construction phase and decommissioning phases of the wind farm. During the operation of the wind farm, traffic would be minimal since much of the operation of the wind farm would be automatic and would be monitored as part of the wider management of the existing wind farm at Paul's Hill.

14.13.3 The construction of Paul's Hill II Wind Farm is expected to last approximately 12 months, from site mobilisation through to installation and commissioning of the turbines, ending with site re-instatement and demobilisation.

12.1.1 Based on the criteria explained in the methodology the assessment concludes that:

- Traffic effect on the A95 at Locations 1055, 74436 and 30867 is considered to be of **Negligible / Low Significance**.
- Traffic effect on the A941 at Location 20985 is considered to be of **Negligible / Low Significance**.
- Traffic effect on B9138 at Location A is considered to be of **Low / Moderate Significance**.
- Traffic effect on B9102 at Location B is considered to be of **Negligible / Low Significance**.
- Traffic effect on the unclassified (C13e) at Location C is considered to be of **Negligible / Low Significance**.
- Noise and vibration impacts have potential for a **Moderate Significance**, but if the embedded mitigation measures proposed are adopted they would be of **Low / Moderate Significance**.
- Dust and dirt pollution has the potential for a **Moderate Significance**, but if the embedded mitigation measures proposed are adopted they would be of **Low / Moderate Significance**.
- Air pollution has the potential for a **Moderate Significance**, but if the embedded mitigation measures proposed are adopted they would be of **Low / Moderate Significance**.
- During the operation period of the wind farm **Negligible / Low Significant** impacts are foreseen.
- During the decommissioning period the activities have the potential for **similar significant impacts**. The impacts cannot be fully assessed until the methods for decommissioning have been agreed, nevertheless it

would be expected that the impacts would be similar or less to those identified here and the similar embedded mitigation measures be applied.

12.1.2 Taking into account the embedded mitigation measures proposed the overall impact of the proposed transport during construction and operation is deemed to have **Low / Moderate Significance** which is **Not Significant** in terms of the EIA regulations.

14.14 HUMAN HEALTH AND POPULATION

14.14.1 The Human Health and Population Chapter includes a section outlining the socioeconomic context of the proposed development locally, regionally and nationally. This includes a review of publicly available information sources related to socioeconomic context of the area. This chapter also includes a section giving details of the economic and community benefits of the existing Paul's Hill Wind Farm and how the proposed Paul's Hill II Wind Farm could add to these benefits. This section also considers other socioeconomic factors such as the impact of wind farms on house prices and the impact of wind farms on tourism and recreation, both from a Paul's Hill II perspective and generally.

14.14.2 The chapter additionally includes the noise assessment of the proposed development, and considers the potential for ice throw.

14.14.3 There is no shadow flicker assessment within the ES as the nearest residential property to the proposed development is located over 10 turbine rotor diameters from the nearest turbine.

14.14.4 In relation to the socioeconomic impact it is considered that the proposed development has the potential to create positive socioeconomic impacts locally, regionally and nationally. As with the existing Paul's Hill Wind Farm, the proposed development also has the potential to coexist with its neighbouring properties and settlements and create positive community and economic benefits for the local area and beyond.

14.14.5 In relation to the noise assessment, the results show that the proposed Paul's Hill II Wind Farm on its own, and the cumulative predicted operational noise levels meet the ETSU-R-97 simplified noise limit, and therefore no significant operational noise impacts are predicted.

14.14.6 The noise assessment also indicates that with the implementation of appropriate embedded mitigation measures during construction there should be no significant construction noise impacts predicted, and there should also be no significant noise impacts predicted related to road traffic noise generated by construction traffic accessing the site during the construction phase of the development.

14.14.7 In terms of the potential impact of ice throw it is considered that turbine procurement together with good practice site management procedures including the use of visual warnings signs and restricted access to turbines where ice is present on blades there will be no significant impact for the public or for site workers using the site.

14.16 RESIDUAL EFFECTS AND MITIGATION

14.16.1 The following Table 14.1 summarises the proposed mitigation measures, with significant impacts highlighted in bold. Table 14.2 provides a summary of all the effects, mitigation and residual effects and gives appropriate ES and Scoping Report references.

Table 14.1: Register of mitigation of the proposed development (mitigation measures relating to significant impacts are in bold)

ES Chapter/Principle Area of Effect	Mitigation Measure	Considerations
Landscape and Visual	**Embedded Mitigation**	**Limited local significant impacts have been identified. See section 6.5 of Chapter 6: Landscape and Visual for details of the embedded mitigation incorporated into the design. See also Chapter 3: Site Selection and Evolution for detailed design consideration for the proposed development.** **The significant impacts that have been identified, such as from LCT 7 & 11, Viewpoint 1 and residential dwellings are considered acceptable in landscape and visual terms.**
Ecology	Embedded Mitigation	No significant impacts anticipated with embedded mitigation. See Table 7.17 in Section 7.8 of Chapter 7: Ecology for a summary of the embedded mitigation proposed.
Ornithology	Embedded Mitigation	No significant impacts anticipated with embedded mitigation. See Table 8.18 of section 8.6 of Chapter 8: Ornithology for a summary of the embedded mitigation proposed.
Cultural Heritage	Embedded Mitigation	No significant impacts anticipated with embedded mitigation. See section 9.8 of Chapter 9: Cultural Heritage for a summary of the embedded mitigation proposed
Hydrology, Geology and Hydrogeology	Embedded Mitigation	No significant impacts anticipated with embedded mitigation. See Table 10.18 of section 10.7 of Chapter 10: Hydrology, Geology and Hydrogeology for a summary of the embedded mitigation proposed.
Aviation and Existing Infrastructure	**Micrositing Restriction of Turbine 7 or upgrade of Antenna to avoid interference to communication link.**	**See Technical Appendix 11.1 for letter from JRC confirming the requirements of the link owner. The mitigation could be secured through a planning condition.**
	Mitigation of ATC radar at RAF Lossiemouth to alleviate potential interference caused by turbines.	**The extent of the impact is currently being explored with the MOD and mitigation (if required) could be secured through a planning condition.**
	Mitigation of ATC radar at Inverness Airport to alleviate potential interference caused by 2 turbines.	**The extent of the impact is currently being explored with HIAL and mitigation (if required) could be secured through a planning condition.**
	Embedded Mitigation	No significant other impacts anticipated with embedded mitigation. To protect existing infrastructure such as pipelines and buried cables, details will be provided in the CMS. See Chapter 11: Aviation and Existing Infrastructure.
Traffic and Transport	Embedded Mitigation	No significant impacts anticipated with embedded mitigation. See Table 12.6 in section 12.7.6 of Chapter 12: Traffic and Transport for a summary of the embedded mitigation proposed.
Human Health and Population	Embedded Mitigation	No significant impacts anticipated with embedded mitigation. See section 13.3.82 to 13.3.88 of Chapter 13: Human Health and Population for a summary of the embedded mitigation proposed relating to noise.

Table 14.2: Summary of Effects, Mitigation and Residual Effects (with appropriate Scoping Report and ES references)

Topic	Scoping Report	Summary of Scoping Opinion / Other Consultee Responses	EIAR reference	Predicted Effects	Proposed Mitigation	Residual Effects
Landscape & Visual	Section 13 in Appendix 1.1	See Appendix 1.2. See also Table 3.1 in Chapter 3 of the ES for full list of consultees and actions taken following Scoping Opinion. <u>Scottish Natural Heritage SNH</u> Main issues are the request from 1 additional viewpoint and the inclusion of Ourack and Clash Gour in the cumulative assessment <u>Cairngorms National Park Authority (CNPA)</u> The site is located approximately 7 km (at its nearest point) to the north of the Cairngorms National Park. CNPA have asked that the potential for impacts upon the National Park be fully considered in any submission made. They considered that key potential impacts would be: • Landscape and visual effects from the northern parts of the Park arising from the increased number of turbines visible. The differences in height and layout could make the proposed extension to the wind farm more visible and visible in additional areas within the Park. • Cumulative effects as experienced from the Park. • Effects on the Special Landscape Qualities experienced within the Park. • Effects on the Special Landscape Qualities experienced within the Park. The ES should contain sufficient information and analysis in respect of these topics for the appropriate policy tests to be undertaken (National Park Partnership Plan policies 1.3 and 3.3 and Scottish Planning Policy test contained in paragraph 212). It was requested that cumulative assessment include pre-application developments Clash Gour and Ourack due to concern about the cumulative impact of these developments. It was also requested that a viewpoint is added on the B970 at Mains of Garten (296541, 819941) for assessing the effects on the landscape character resulting from the proposal which is substantially different in height, size and appearance to the existing Paul's Hill Wind Farm. Concerns were raised about viewpoints that show visibility of any of the turbines in the low lying Strath, due to potential impact it will have on the experience of Special Landscape Qualities there. <u>John Muir Trust</u>	Chapter 6	1. Potential significant impacts on Landscape Character Types LCT 7 and 11. 2. One out of the ten selected viewpoints has been identified as potentially experiencing ***Moderate*** and ***Significant*** visual and cumulative effects for cumulative baseline 1 (operational wind farm developments): Viewpoint 1 - Tormore Distillery. 3. Two significant effects and one borderline significant effect identified from the three individual and isolated properties within 3 km of the proposed development.	1. Embedded mitigation in the form of carefully considered design relative to the specific landscape context (see 14.7.3). 2. Embedded mitigation in the form of carefully considered design relative to the specific landscape context (see 14.7.5). 3. Screening (e.g. from topography and/or trees), the carefully designed layout and the localised nature of these effects mitigate these effects which are assessed as not significantly affecting the overall visual component of living conditions for any of these three properties.	**Significant but considered acceptable** **Significant but considered acceptable** **Significant but considered acceptable**

Topic	Scoping Report	Summary of Scoping Opinion / Other Consultee Responses	EIAR reference	Predicted Effects	Proposed Mitigation	Residual Effects
		Do not comment at the scoping stage due to staff resourcing. Will issue comment once the project has progressed to application.				
Ecology	Section 14 in Appendix 1.1	See Appendix 1.2. See also Table 3.1 in Chapter 3 of the ES for full list of consultees and actions taken following Scoping Opinion. <u>Scottish Natural Heritage SNH</u> HRA required regarding potential impact on River Spey SAC. In additional to the CEMP it is recommended that an operational phase breeding bird protocol is prepared to detail what happens on site in the event of sensitive species nesting in locations where there may be operational activities. Agreed to scoping out otter for the main wind farm site. Agreed to scoping out the distant SPA's as there are no connectivity. <u>Marine Scotland</u> Potential impacts of the River Spey Catchment SAC should be fully assessed – salmon are a primary feature of this status. It is encouraged that up to date information to be used to inform the EIA. Impact of any felling, if carried out, on the water quality and aquatic biota and the cumulative impact as a result of the present proposal and adjacent wind farms should be considered throughout the development. <u>Spey Fishery Board</u> Indicated that they had not responded previously because we did not have any significant concerns regarding the proposals. They have had a long history of association with the Paul's Hill Wind Farm and so the developers have already been in touch with us directly. As a result, they are already engaging with them over the details and are expecting to undertake survey work on their behalf, should the scheme proceed.	Chapter 7	No predicted significant effects In relation to the Habitat Regulations Assessment (HRA) for the main wind farm site, with the successful implementation of all of the embedded mitigation it is concluded that potential effects for all qualifying features of the River Spey SAC will be reduced to **Negligible** and there will be **No Adverse Effect** resulting from this proposed wind farm development. In relation to additional works that may be required along the access route (particularly in the vicinity of Blacksboat Bridge) these will have to be provided at a later stage. It is assumed for the purpose of determining this application that any such works will not have an adverse effect on the River Spey SAC. In general, it will be the aim to select turbine components and an appropriate mode of delivery that fits within the current parameters of the highway. Additional information on this matter will be provided as required to the planning authority and other stakeholders prior to construction.	By applying effective embedded mitigation measures, mainly through the design process, implementing the proposed fish monitoring programme and following best practice guidelines during construction including production of a Species Protection Plan (SPP), the magnitude of residual effects of Paul's Hill II Wind Farm are assessed as being reduced to **Negligible** in terms of magnitude, and thus **Not Significant** in terms of the EIA Regulations. Refer to Table 7.17 in Section 7.8 of Chapter 7: Ecology for a summary of the embedded mitigation proposed.	**Not significant**

Topic	Scoping Report	Summary of Scoping Opinion / Other Consultee Responses	EIAR reference	Predicted Effects	Proposed Mitigation	Residual Effects
Ornithology	Section 15 in Appendix 1.1	See Appendix 1.2. for SNH and RSPB responses. SNH No major ornithological concerns raised by SNH following scoping report. RSPB Overall, the RSPB was satisfied that the proposed ornithological survey methods are appropriate.	Chapter 8	The assessment identified no significant effects following embedded mitigation measures, of the proposed development on ornithological interests.	Specific embedded mitigation measures for black grouse, hen harrier and merlin are proposed to minimise the potential effects of disturbance and/or displacement, and to ensure compliance with the Wildlife and Countryside Act (1981) as amended by the Nature Conservation (Scotland) Act (2004). A SPP is proposed and best practice guidance regarding breeding birds will be followed, with an ECoW employed during construction. A HMP targeted at hen harrier and merlin is also proposed, incorporating an OMP to assess the efficacy of measures outlined in the HMP and species-specific embedded mitigation outlined for black grouse, hen harrier and merlin. It is considered that following the implementation of these species specific embedded mitigation measures there will be **No Significant Adverse Impacts** on the main target species associated with the proposed Paul's Hill II Wind Farm. Refer to Table 8.18 of section 8.6 of Chapter 8: Ornithology for a summary of the embedded mitigation proposed	**Not significant**

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Cultural Heritage	Section 19 of Appendix 1.1	See Appendix 1.2. See also Table 3.1 in Chapter 3 of the ES for full list of consultees and actions taken following Scoping Opinion. <u>Historic Environment Scotland</u> The ES should pay attention to the impacts on Category A listed buildings and scheduled monuments. This includes assessing the impacts on Ballindalloch Castle (LB8449), Ballindalloch Castle Dovecot (LB8450). Cumulative impacts should also be assessed and examined through the use of cumulative visualisations.	Chapter 9	It is anticipated that no known heritage assets would be directly affected in the main wind farm area. It is also anticipated that no known heritage assets would be directly affected by the proposed highways works or cabling works but there remains some limited possibility that those works could have an adverse effect on any unrecorded, buried archaeological remains present in affected areas. In terms of indirect impacts on the setting of cultural heritage assets, no heritage assets have been identified where potentially adverse impacts on their settings would arise. A detailed assessment has been undertaken of the potential impact on Ballindalloch Castle, Ballindalloch Castle Dovecote and the castle grounds and no significant impact is predicted. There is also considered to be no significant cumulative effect on the setting of any heritage assets.	As no significant direct or indirect impacts have been identified no mitigation is currently required. Whilst there is some potential for heritage assets to be impacted by highway works, it is considered that known heritage assets can be avoided. Refer to section 9.8 of Chapter 9: Cultural Heritage for a summary of the embedded mitigation proposed	**Not significant**
Hydrology, Geology and Hydrogeology	Section 16 in Appendix 1.1	See Appendix 1.2. See also Table 3.1 in Chapter 3 of the ES for full list of consultees and actions taken following Scoping Opinion. <u>SEPA</u> Site specific comments included ensuring ES covers each groundwater supply that is 250m from a groundwater supply source. Also that watercourse crossings are designed for a 1 in 200 year event. There is no need for information on flood risk, as this is not a flood risk area. In relation to Appendix 1 of the letter, need to ensure the protection of the River Spey SAC and protection of the water environment. Good practice and guidance must be followed. Detailed information on peat depths across the site should be provided and the impact on GWDTE's should be assessed and avoided as far as is practical.	Chapter 10	1. Assuming the successful design and implementation of embedded mitigation. measures the significance of construction effects on all identified receptors is considered to be of **minor or no significance.** The assessment of predicted ongoing and operational effects has also determined that the significance of effects on all receptors to be of **minor/moderate minor or no significance**. 2. The Private Water Supply Risk Assessment (Technical Appendix 10.7) identified a Medium/Low risk to Corglass Lodge, Corglass Beag (219) as a result of potential	1. Refer to Table 10.18 of section 10.7 of Chapter 10: Hydrology, Geology and Hydrogeology for a summary of the embedded mitigation proposed. 2. It is recommended that monitoring at both source and point of consumption is carried out during this upgrade work. Agreement with the property owner, monitoring	**Not significant**

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		<u>Scottish Water</u> Scottish Water has abstractions from 2 sources in the area: Spey Boreholes and Ordiequish collecting chamber which are surface water influenced. The sources are located 30km downstream of the site on the River Spey. As part of the ES, an assessment would need to be undertaken to ensure that any activities do not impact these sources.		impact during planned resurfacing work to the existing access track.	frequency and parameters monitored would be agreed post consent. Monitoring regime would conform to the relevant guidance & best practice statements.	
Aviation and Existing Infrastructure	Section 21 in Appendix 1.1	See Appendix 1.2. See also Table 3.1 in Chapter 3 of the ES for full list of consultees and actions taken following Scoping Opinion. <u>MoD/DIO</u> Development will cause unacceptable interference to ATC radar used by RAF Lossiemouth being situated 29.5km away. The reasons for the objection include: i. Restrictions the development would impose upon departure routes including Standard Instrument Departures (SIDS); ii. Restrictions the development would impose upon approach and arrival procedures; iii. Restrictions the development would impose upon LARS/ZONE traffic patterns; iv. Restrictions the development would impose upon special tasks conducted by the Unit; v. Restrictions the development would impose upon Tactical Aid to Navigation (TACAN) procedures; vi. Air traffic density in the vicinity of the proposed windfarm; vii. Existing clutter or windfarms in the vicinity of the proposed windfarm; and viii. The type and characteristics of aircraft routinely using the airspace in the vicinity of the proposed windfarm. ix. The performance of the radar x. The complexity of the ATC task xi. The workload of controllers If the developer is able to overcome the issues stated then the MoD request that all turbines be fitted with accredited 25 candela omni-directional red lighting or infra-red lighting. <u>HIAL</u> This development falls inside the safeguarded areas for Inverness Airport (as defined in CAP 764 – CAA Policy and Guidelines on Wind Turbines and CAP 670 - Air Traffic Services Safety Requirements). The turbines could possibly affect the performance of electronic aeronautical systems for the airport. HIAL would not wish to see a degradation of any of these services, particularly the Radar installation. (At 150m	Chapter 11	1. The proposed development is likely to have significant effects on aviation interests. The wind turbines are likely to cause interference to both civil and military ATC radar located at Inverness Airport and RAF Lossiemouth respectively. 2. The proposed development also has the potential to significant effects on a communications link. A detailed assessment by JRC identified that it is only T7 that could potentially interfere with the link. 3. No significant other impacts anticipated with embedded mitigation.	1. The applicant is in dialogue with the HIAL and the MoD to identify suitable mitigation solutions to reduce the impact to an acceptable level. Mitigation measures could be secured with appropriate planning conditions. 2. Potential mitigation measures include agreeing to a micro-siting restriction ensuring that the turbine position does not move closer to the link or upgrade of the antenna (if the former is not possible). Refer to the letter from JRC for confirmation of the requirements of the link owner (see Technical Appendix 11.1). The mitigation could be secured through a planning condition. 3. Embedded mitigation to protect infrastructure and Rights of Way will be included in the CMS.	**Not Significant once Mitigation applied** **Not Significant once Mitigation applied** **Not significant**

Topic	Scoping Report	Summary of Scoping Opinion / Other Consultee Responses	EIAR reference	Predicted Effects	Proposed Mitigation	Residual Effects
		these turbines are likely to be in line of sight of the radar). It should be noted that HIAL would work with the developer towards a resolution. However, HIAL are likely to object to any proposal which impacts on the Radar, unless an acceptable solution can be found to mitigate the effect on Inverness Airport's operation. <u>Highland Gliding Club</u> Issue of the proposed wind farm was raised at a board meeting at Highland Gliding Club and the decision was not to make any representations at this stage. They reserve the right to make representations at some point in the future, once we gauge further reaction, including from RAF Lossiemouth. <u>JRC</u> JRC objected to the development on the grounds that turbines 3, 5, 6 and 7 could potentially interfere with SSE 0929271/1 and SCHY 0929271/1.				
Traffic & Transport	Section 20 in Appendix 1.1	See Appendix 1.2. See also Table 3.1 in Chapter 3 of the ES for full list of consultees and actions taken following Scoping Opinion. <u>Moray Council</u> The chapter on traffic and transport should be supported by a construction method statement (CMS) and construction traffic management plan (CTMP) focussing on delivery of abnormal loads and the impact of HGV construction traffic on the local roads networks. This would involve a pre commencement condition survey in a format agreeable to the Moray Council as the local roads authority and possibly a Section 96 wear and tear agreement if necessary. EIA report should address and mitigate any conflict between the proposal and RAF Lossiemouth if the MOD deems it necessary.	Chapter 12	Taking into account the embedded mitigation measures proposed the overall impact of the proposed transport during construction and operation is deemed to have **Low / Moderate Significance** which is **Not Significant** in terms of the EIA regulations.	It has been agreed with Moray Council planner on the 15th December by phone call that a construction method statement and a construction traffic management plan will not be provided at the current time as insufficient detail is available (i.e. no turbine supplier or main contractor have been selected). It was agreed that these would be provided pre construction. Refer to Table 12.6 in section 12.7.6 of Chapter 12: Traffic and Transport for a summary of the embedded mitigation proposed.	**Not significant.**

Topic	Scoping Report	Summary of Scoping Opinion / Other Consultee Responses	EIAR reference	Predicted Effects	Proposed Mitigation	Residual Effects
Human Health and Population (Noise)	Section 18 and 22 in Appendix 1..1	See Appendix 1.2. See also Table 3.1 in Chapter 3 of the ES for full list of consultees and actions taken following Scoping Opinion. <u>Visit Scotland</u> Given the aforementioned importance of Scottish tourism to the economy, and of Scotland's landscape in attracting visitors to Scotland, Visit Scotland would strongly recommend any potential detrimental impact of the proposed development on tourism - whether visually, environmentally and economically - be identified and considered in full. This includes when taking decisions over turbine height and number. <u>British Horse Society</u> The ES should include an assessment of the potential impacts of the proposed wind farm on public outdoor access rights. The Environmental Statement should adhere to Section 7 of the publication "Good Practice during wind farm construction 2010" and together with addressing the impact on outdoor access, mitigation/enhancement measures should be identified. The Environmental Statement should include a Public Access Plan to demonstrate how the applicant/developer intends to manage walkers, cyclists and horse riders exercising rights in the vicinity of the wind turbines. The Scoping Opinion should confirm the requirements to address this matter including identification of all required/proposed mitigation measures to address impacts on routes, and identify opportunities to extend and enhance public access/path networks both within and to/from the site and any nearby path network. Details of all required/proposed alterations to existing and provision of new path routes should be included within the formal submission. The Scoping Opinion should confirm that the Moray Access Manager should be consulted regarding public outdoor access	Chapter 13	In relation to the noise assessment, the results show that the proposed Paul's Hill II Wind Farm on its own, and the cumulative predicted operational noise levels meet the ETSU-R-97 simplified noise limit, and therefore no significant operational noise impacts are predicted. In relation to the socioeconomic impact it is considered that the proposed development has the potential to create positive socioeconomic impacts locally, regionally and nationally. As with the existing Paul's Hill Wind Farm, the proposed development also has the potential to coexist with its neighbouring properties and settlements and create positive community and economic benefits for the local area and beyond. With embedded mitigation no ice throw incidents are anticipated. No shadow flicker effects are anticipated as the nearest residential property to the proposed development is located over 10 turbine rotor diameters from the nearest turbine.	The noise assessment indicates that with the implementation of appropriate embedded mitigation measures during construction there should be no significant construction noise impacts predicted, and there should also be no significant noise impacts predicted related to road traffic noise generated by construction traffic accessing the site during the construction phase of the development. Refer to section 13.3.82 to 13.3.88 of Chapter 13: Human Health and Population for a summary of the embedded mitigation proposed relating to noise. In terms of the potential impact of ice throw it is considered that turbine procurement together with good practice site management procedures including the use of visual warnings signs and restricted access to turbines where ice is present on blades there will be no significant impact for the public or for site workers using the site.	**Not significant**

Topic	Scoping Report	Summary of Scoping Opinion / Other Consultee Responses	EIAR reference	Predicted Effects	Proposed Mitigation	Residual Effects
		including matters relating to established/recognised rights of way and core path initiatives within the proposed wind turbine site and the surrounding area. In addition, a Public Access Plan should be prepared and included as part of the formal submission.				

14.17 CONCLUDING STATEMENT

14.17.1 The ES has highlighted that the only residual significant effects that have been identified during the EIA process are as a result of local landscape and visual impacts, potential interference of the turbines with civil and military ATC radar and potential interference with a communications link.

14.17.2 A relatively limited number of significant effects were identified within Chapter 6: Landscape and Visual Assessment, of the ES on what are generally considered to be receptors of local importance. Whilst localised significant landscape and visual effects have been identified, the wider landscape would not be transformed as a result of the proposed development and as such, it is considered that the landscape at a broad scale is sufficiently robust enough to accommodate the proposed development without significant effects arising. The extent of significant cumulative effects attributable to the proposed development is also considered to be of modest proportions.

14.17.3 Whilst it is acknowledge that the three residential receptors within 3 km of the proposed development may experience significant effects, it is considered that screening (e.g. from topography and/or trees), the carefully designed layout and the localised nature of these effects mitigate these effects and do not significantly affect the overall visual component of living conditions for any of these three properties. These effects are therefore considered acceptable in landscape and visual terms.

14.17.4 In relation to the significant impacts on civil and military ATC radar at Inverness Airport and RAF Lossiemouth, it is considered that these impacts can be mitigated and that mitigation could be secured with appropriate planning conditions.

14.17.5 Equally, in relation to the significant impact on the communication link caused by turbine 7, it is considered that this impact can be mitigated, by applying a micro-siting restriction or upgrading the antennae, and that again mitigation could be secured with an appropriate planning condition.

14.17.6 It is proposed that, as far as is practical, the planning conditions that applied to the Paul's Hill Wind Farm consent in 2004 (see Appendix 1.3) should also be applied to the proposed development. This will ensure that there is, in general, duplicate sets of similar conditions applying to the wind farm as a whole with the new set recognising the use of shared infrastructure for the lifetime of the new phase of development. Reference is made throughout the ES to specific planning conditions in the original planning consent where it is considered that these could be applied to the proposed development.

14.17.7 Subject to suggested mitigation measures and considerations summarised in Table 14.1 and 14.2 above, the ES did not identify any other potentially significant residual effects (in terms of the EIA Regulations) on any other environmental or human receptors during the preparation, construction, operation and decommissioning of the proposed Paul's Hill II Wind Farm development and as such the overall impact of the proposed development is considered not significant in EIA terms.

natural power

Natural Power acting as lead consultants
on behalf of Fred. Olsen Renewables.

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