RWE

Clachaig Glen Wind Farm

Habitats Regulations Appraisal

Screening Report

Prepared for:

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1. Introduction

1.1 Purpose of Habitats Regulations Appraisal Screening Report

1.1.1 This Habitats Regulations Appraisal (HRA) Screening Report has been prepared by AECOM on behalf of RWE Renewables UK Onshore Wind Ltd (formerly known as E.ON Climate & Renewables UK Developments Ltd) (hereafter referred to as '**the Applicant**'). Its purpose is to support an application under Section 36 of the Electricity Act 1989, as amended ('**the Act**') for the proposed Clachaig Glen Wind Farm and Battery Storage Site ('**the Proposed Development**') which would have an installed capacity in excess of 50 megawatts (MW).

1.1.2 The Proposed Development is located approximately 20 kilometres (km) to the north of Campbeltown, 1.8km north east of the small hamlet of Muasdale and 3.7km south east of Tayinloan, in the administrative area of Argyll and Bute Council. The general site location (hereafter referred to as the '**Development Site**') is shown on Figure 1: Site Location Plan (HRA).

1.1.3 The HRA Screening Report is one of a wider suite of reports and documents submitted with the Section 36 Application for the Proposed Development, as illustrated through Image 1-1.

1.1.4 The purpose of this HRA Screening Report is to help determine, in view of best available scientific knowledge, whether the Proposed Development, either alone or in combination with other plans or projects, could have likely significant effects (LSE) on Special Areas of Conservation (SAC) or Special Protection Areas (SPA), as well as those sites listed in Paragraphs 3.1.4 and 3.1.5, in view of the conservation objectives of the relevant sites. This is conducted through an examination of potential impacts of the Proposed Development on European Sites and is in line with the legislative context set out in Section 3.

1.1.5 Whilst the various steps involved in an HRA assessment process, as detailed in Section 3, must be carried out by a competent authority; consultants or project proponents may provide the information that the competent authority requires to undertake a HRA. This HRA Screening Report is therefore written to provide the competent authority – the Scottish Ministers – with the information needed to conduct a HRA of the Proposed Development.

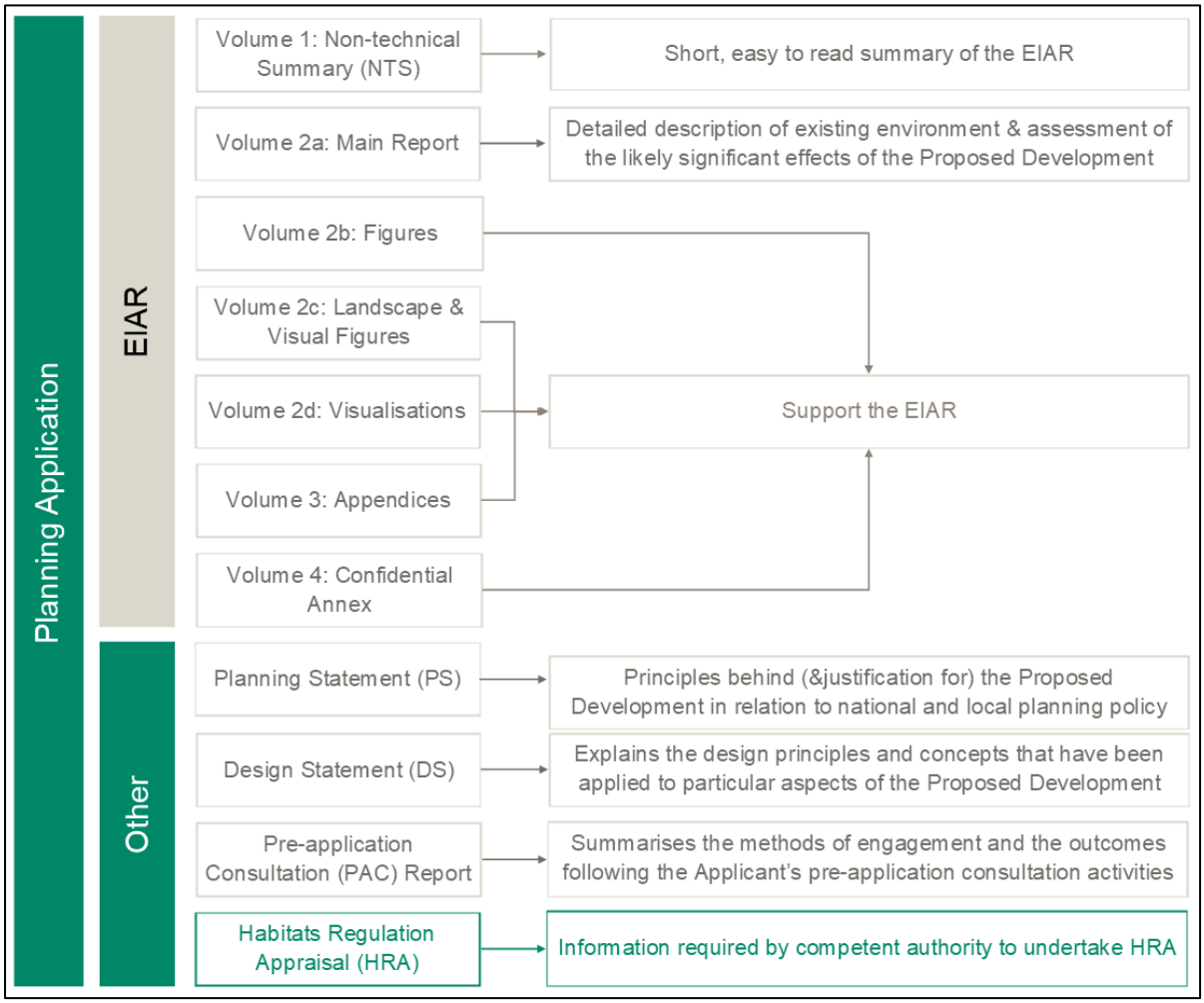

Image 1-1 Key Documents for Section 36 Application

2. Description of the Proposed Development

2.1 Consented Development

2.1.1 In December 2019, the Applicant gained approval under section 48 of the Town and Country Planning (Scotland) Act 1997 (as amended) for a 47.6 MW wind farm at the Development Site ('the Consented Development'). This was through appeal to Scottish Ministers (reference PPA-130-2064).

2.1.2 The Consented Development comprises 14 wind turbines: 13 with a blade tip height of up to 126.5 metres (m) (and hub height of up to 80m); one with a blade tip height of up to 115.5m (and hub height of up to 69m); and associated infrastructure (see Figure 1.2: Consented Development; EIAR Volume 2a).

2.2 Proposed Development

2.2.1 Due to the advancement of wind turbine technology, subsequent design modifications (see the Design Statement) and significant changes to the wider economics of onshore wind farms and other renewable technologies in Scotland, the Applicant is now submitting a new application under Section 36 of the Act to construct and operate a wind farm and battery storage facility with a generating capacity in excess of 50MW on the existing site of the Consented Development (see Figure 2: Layout of the Proposed Development; HRA).

2.2.2 The Development Site boundaries for the Consented Development and the Proposed Development are almost identical, except for:

- the access road leading from the A83 to the main Development Site. This would have to be wider than the access for the Consented Development to accommodate the delivery of larger turbine components,
- a new temporary turbine laydown area on the opposite (western) side of the A83 to the Development Site to facilitate the likely use of blade lifter technology, and
- a section on the eastern edge of the main Development Site, which has been excluded at the request of the landowner, Forestry and Land Scotland (FLS).

2.2.3 The Proposed Development comprises 12 wind turbines (two less than the Consented Development) and seeks an increased operational period of 35 years (the operational period is 25 years for the Consented Development). The Proposed Development additionally includes a battery storage facility (with an expected upper capacity of 30 MW) that was not part of the Consented Development.

2.2.4 Five of the turbines within the Proposed Development would have a maximum blade tip height of 200m, whilst the remaining seven would have a maximum tip height of 185m. All would have a maximum rotor diameter of 155m.

3. Legislative Context

3.1.1 Under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) (more commonly referred to as the 'Habitats Regulations'), a network of sites has been designated across Scotland and its marine environment for the purposes of nature conservation. This network comprises sites known as SAC and SPA. SACs are designated for the protection of habitats and non-avian animal species of conservation concern. SPAs are designated to protect rare or vulnerable species of bird, as well as all regularly occurring migratory bird species. Scotland's SACs and SPAs are referred to as 'European sites'.

3.1.2 The Habitats Regulations or, for reserved matters and Section 36 consent applications, the Conservation of Habitats and Species Regulations 2017 (as amended), require that any plan or project which is not directly connected with or necessary to the conservation of a European site, and which is likely to have a significant effect on such as site, must be subject to an 'appropriate assessment' of the implications for the conservation objectives of that site. Generally, such plans or projects may only be approved if the 'competent authority' has ascertained, by means of an appropriate assessment, that there will be no adverse effect on the integrity of the European site(s).

3.1.3 The procedure applied is known as 'Habitats Regulations Appraisal'[1].

3.1.4 In addition to fully designated European sites, the Habitats Regulations also apply to those sites in the earlier stages of the designation process, including:

- Sites of Community Interest (SCI),
- Candidate Special Areas of Conservation (cSAC),
- Possible / proposed Special Areas of Conservation (pSAC), and
- Potential / proposed Special Protection Areas (pSPA).

3.1.5 Moreover, and as a matter of Scottish Government policy, HRA also needs to include consideration of Wetlands of International Importance (more commonly known as 'Ramsar sites'). For the remainder of this document, the term 'European site' is used to refer to fully designated SACs, SPAs, Ramsar sites and candidate, possible and/or proposed SACs / SPAs, and SCI.

3.1.6 The competent authority that carries out the HRA is required to apply the precautionary principle to European sites and can only grant consent for a plan or project once it has been ascertained that it will not adversely affect the integrity of the site concerned. However, even if significant adverse effects on the designated site are predicted, and in the absence of a suitable alternative solution, the plan or project can still be carried out in circumstances where

[1] In the past, the term 'appropriate assessment' has been used to describe both the overall process and a particular stage of that process. The term 'Habitat Regulations Appraisal' has come into use in order to refer to the process that leads to or follows an appropriate assessment, thus avoiding confusion. Throughout this document, HRA is used to refer to the overall procedure required by the Habitats Regulations.

there are deemed sufficient imperative reasons of over-riding public interest (IROPI). In such cases, however, compensatory measures must be implemented.

3.2 Overview of the HRA Process

3.2.1 Guidance recently published by the European Commission (European Commission, 2020) provides advice on the assessment of wind farm developments on European sites, and cognisance has been given, where appropriate, to the contents of that document.

3.2.2 The Habitats Regulations set out a step-by-step sequence of statutory procedures to be followed for HRA. The steps are designed to test the potential effects of a plan or project on a European site and must be followed in the correct and particular order.

3.2.3 The Habitats Regulations do not prescribe a particular methodology for carrying out an appraisal of plans or projects. NatureScot (formerly Scottish Natural Heritage (SNH)) recommend an approach, as described in SNH (2015), which is outlined as a series of thirteen steps. However, with cognisance of recent case law (refer to Table 3-1) clarifying when mitigation can be taken into account in the HRA process, AECOM has revised the process to constitute eleven stages (see Image 3-1). It should be noted that this guidance specifically relates to the appraisal of plans, however the principles and broad process are identical for plans and projects. Further guidance published by NatureScot on HRA (SNH, 2014) also sets out the methods for assessing whether plans or projects will affect a European site.

3.2.4 Once the need for a HRA has been established and research conducted, the first step in the sequence of tests is to establish whether an appropriate assessment is required. This is often referred to as appropriate assessment (or AA) screening. The purpose of AA screening is to determine, in view of best available scientific knowledge, whether a plan or project, either alone or in combination with other plans or projects, could have LSE on a European site, in view of that site's conservation objectives.

3.2.5 For this purpose, and as a result of case law, 'likely' means 'possible' (see Table 3-1). If the competent authority determines that there are no LSE (including 'in combination' effects from other plans or projects), then no further assessment is necessary and the plan or project can, subject to any other issues, be taken forward. If, however, the competent authority determines that there are LSE, or if there is reasonable scientific doubt, then the next step in the process must be initiated and a detailed appropriate assessment undertaken.

3.2.6 The purpose of the appropriate assessment is to carry out sufficient scientific investigation to ascertain whether the plan or project, alone or in combination with other plans or projects, will not adversely affect the integrity of European sites, in view of their conservation objectives and considering any design modifications or mitigation (but not compensatory measures, which can only be considered when an assessment of alternative solutions and an assessment where no alternative solutions exist and where adverse effects remain (i.e. consideration of IROPI)have been completed).

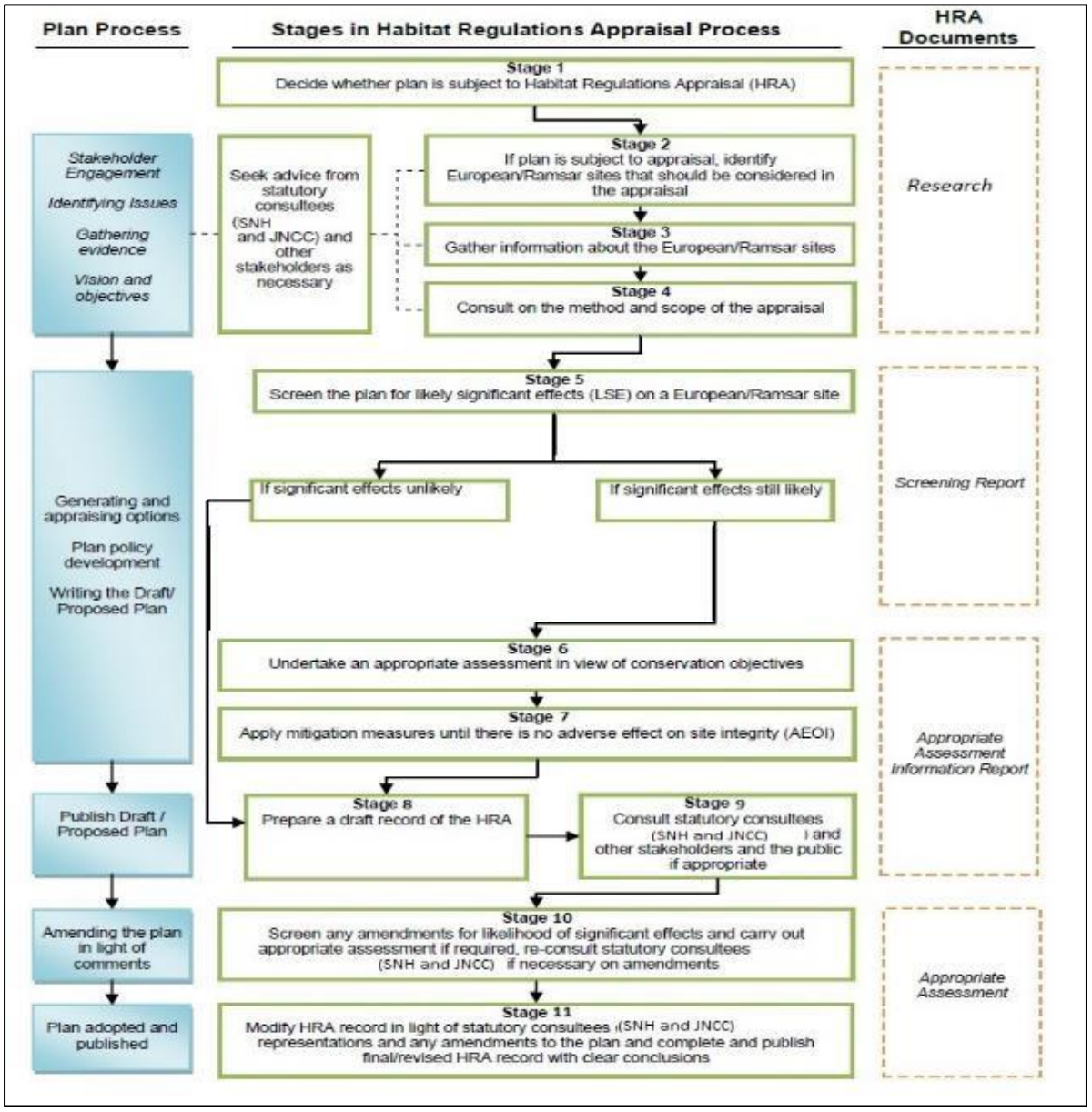

Image 3-1 Stages of the HRA Process (adapted from SNH (2015))

3.3 Relevant Case Law

3.3.1 Although the UK is no longer part of the European Union (EU), it is Scottish Government and NatureScot policy to continue to have regard to relevant rulings of the Court of Justice of the European Union (CJEU) for the purposes of HRA. The case law described in Table 3-1 is therefore relevant and has been considered throughout this HRA screening exercise.

Table 3-1 Case Law Relevant to the HRA of the Proposed Development

Case	Ruling	Relevance to the HRA of the Proposed Development
People Over Wind and Sweetman v Coillte Teoranta (C-323/17)	The ruling of the CJEU in this case requires that any conclusion of 'no likely significant effect' on a European site must be made prior to any consideration of measures to avoid or reduce harm to the European site. The determination of likely significant effects should not, in the opinion of the CJEU, constitute an attempt at detailed technical analyses. This should be conducted as part of the appropriate assessment.	SNH has published guidance on the implications of this ruling for HRA (SNH, 2019). It will be necessary to distinguish between those measures which are intended to avoid or reduce harmful effects on a European site and those elements of the Proposed Development that may incidentally provide some degree of mitigation, but which are intrinsic or essential parts of the project itself. SNH advises that intrinsic parts of a project can be considered at the screening stage of HRA. If it can be concluded that the Proposed Development will have no adverse effect on any European site, in the absence of mitigation, it will be possible to conclude 'no likely significant effects', and the need for further detailed appropriate assessment will be 'screened out'.
Waddenzee (C-127/02)	The ruling in this case clarified that appropriate assessment must be conducted using best scientific knowledge, and that there must be no reasonable scientific doubt in the conclusions drawn. The Waddenzee ruling also provided clarity on the definition of 'significant effect', which would be any effect from a plan or project which is likely to undermine the conservation objectives of any European site.	A thorough review of available scientific literature has been conducted to inform this HRA and complements the results of targeted field survey also completed. Adopting the precautionary principle, a 'likely' effect in this HRA is interpreted as one which is 'possible' and cannot be objectively ruled out. The test of significance of effects has been conducted with reference to the conservation objectives of relevant European sites.

Case	Ruling	Relevance to the HRA of the Proposed Development
Holohan and Others v An Bord Pleanála (C-461/17)	The conclusions of the Court in this case were that consideration must be given during appropriate assessment to: • Effects on qualifying habitats and/or species of a SAC or SPA, even when occurring outside of the boundary of a European site, if these are relevant to the site meeting its conservation objectives, and • Effects on non-qualifying habitats and/or species on which the qualifying habitats and/or species depend and which could result in adverse effects on the integrity of the European site.	This relates to the concept of 'functionally-linked habitat', i.e. areas inside or outside of the boundary of a European site which supports its qualifying feature(s). In addition, consideration must be given to non-qualifying features upon which qualifying habitats and/or species rely.
T.C Briels and Others v Minister van Infrastructuur en Milieu (C-521/12)	The ruling of the CJEU in this case determined that compensatory measures cannot be used to support a conclusion of no adverse effect on site integrity.	Compensation can only be considered at the relevant stage of HRA and not during appropriate assessment. Compensation must be delivered when appropriate assessment concludes that there will be adverse effects on site integrity.

4. Relevant European Sites

4.1.1 When seeking to identify relevant European sites, consideration has been given primarily to identified impact pathways and the source-pathway-receptor approach, rather than adopting a purely 'zones'-based approach. The source-pathway-receptor approach is a standard tool in environmental assessment. In order for an effect to occur, all three elements of this mechanism must be in place. The absence or removal of one of the elements of the mechanism means there is no possibility for an effect to occur. Furthermore, even where an impact is predicted to occur, it may not result in significant effects (i.e. those which undermine the conservation objectives of a European site). Briefly defined, pathways are routes by which a change in activity can lead to a significant effect upon a European site.

4.1.2 The likely zone of impact (also referred to as the likely 'zone of influence') of a project is the geographic extent over which significant ecological effects are likely to occur. The zone of influence of a project will vary depending on the specifics of a particular proposal and must be determined on a case-by-case basis with reference to a variety of criteria, including:

- The nature, size / scale and location of the project,
- The connectivity between the project and European sites, for example through hydrological connections or because of the natural movement of qualifying species,
- The sensitivity of ecological features under consideration, and
- The potential for in-combination effects.

4.1.3 There is no fixed geographical limit beyond which European sites need not be considered by HRA. However, as a first step in identifying European sites which may be relevant, a search was made for sites within 10km of the Development Site. An overview of the European sites identified within this search area is given in Table 4-1. The locations of these sites are shown on Figure 3: European Sites within 10km of the Development Site (HRA).

Table 4-1 European Sites Within 10km of the Development Site

Site Name	Qualifying Feature(s) (and Latest Assessed Condition)	Summary of Connectivity with the Proposed Development
Sound of Gigha SPA	Fully designated in December 2020, this is a large site providing diverse marine habitats for a range of sea birds. The qualifying features are: • Eider Somateria mollissima, non-breeding, • Great northern diver Gavia immer, non-breeding, and • Red-breasted merganser Mergus serrator, non-breeding.	Located approximately 645m west of the access track entrance from the A83 and 1.25km west of the main Development Site. There is a hydrological connection between the Proposed Development and the SPA via the Clachaig Water and Killean Burn.
Kintyre Goose Roosts SPA and Ramsar site	The Kintyre Goose Roosts SPA and Ramsar site comprises a series of hill lochs (Loch Garasdale, Loch an Fhraoich, Loch Lussa, Tangy Loch and Black Loch) and an area of grassland and heath at Rhunahaorine Point. The site regularly supports an internationally important wintering population of Greenland white-fronted goose *Anser albifrons flavirostris*, which is the sole qualifying feature of the SPA. The latest assessed condition of Greenland white-fronted goose as the sole qualifying feature was Favourable Maintained, assessed in April 2014. The Information Sheet for the Kintyre Goose Roosts Ramsar site also highlights that Tangy Loch is unusually alkaline and has both eutrophic and oligotrophic conditions. This results in a diverse floral assemblage, including the nationally rare slender naiad *Najas flexilis*, which is listed on Annex II of the Habitats Directive.	A multi-part site located approximately 2.45km north-east of the access track and 3.7km north of the main Development Site at its nearest point. All of the lochs covered by the SPA designation are also within the boundary of the Ramsar site. However, the Ramsar site does not cover the area of grassland and heath at Rhunahaorine Point.

Site Name	Qualifying Feature(s) (and Latest Assessed Condition)	Summary of Connectivity with the Proposed Development
Inner Hebrides and the Minches SAC	This is an extremely large site covering a large part of the marine environment off the north-west coast of Scotland. The sole qualifying feature is harbour porpoise *Phocoena phocoena*. The latest assessed condition of harbour porpoise as the qualifying feature was Favourable Maintained, assessed in December 2016.	At closest, approximately 6.5km north of the access track and approximately 8.5km north of the main Development Site. As a marine site, there is a hydrological connection to the Proposed Development via the watercourses which discharge into the sea, namely the Clachaig Water and Killean Burn.

4.1.4 Having identified the European sites within 10km, consideration was next given to the potential impact sources from the Proposed Development at all phases (i.e. construction, operation, decommissioning and restoration) and pathways to European sites (including those located at distances of more than 10km where there is connectivity) by which effects could arise on qualifying features.

4.1.5 Marine SACs and SPAs located more than 10km distant were not included in the assessment because, given the improbability of effects on the open sea at such distances from the Proposed Development and the very large area of alternative habitat available to mobile qualifying features, there is no possibility of any significant effects upon them.

4.1.6 Based on all possible impacts, pathways, and receptors, the zone of influence of the Proposed Development was estimated. A description of this process is given in Table 4-2.

Table 4-2 Potential Impact Sources and Pathways for Effects on European Sites from the Proposed Development

Potential Impact Source	Pathway to European Site(s)	Potential for Effects on Receptor(s)*	European Sites Within Potential Zone of Influence
Construction Phase			
Direct loss of habitat within the boundary of a European site.	There is no pathway – the nearest European site (Sound of Gigha SPA) is approximately 645m from the Development Site.	There is no potential for the direct loss of habitat within the boundary of any European site.	None
Loss of habitat which is used by qualifying species outside of the boundary of a European site (i.e. the loss of functionally-linked habitat).	The Inner Hebrides and the Minches SAC is designated solely for harbour porpoise, which is entirely reliant on marine habitats. The qualifying features of the Sound of Gigha SPA are three non-breeding seabird species which, outside of the breeding season, occur almost exclusively in marine habitats. At closest, the Kintyre Goose Roosts SPA / Ramsar site is approximately 2.45km from the main access track, and 3.7km from the main Development Site. This is well within the core foraging range of Greenland white-fronted goose, which is estimated as being between 5 and 8km (SNH, 2016).	There is no potential for loss of functional-linked habitat of the qualifying species of the Inner Hebrides and the Minches SAC or the Sound of Gigha SPA as they rely entirely on very extensive marine habitats. Any habitat suitable for foraging or roosting by Greenland white-fronted geese which will be lost to the Proposed Development would be within the core foraging range of this species and could represent a potential loss of functionally-linked habitat.	Kintyre Goose Roosts SPA and Ramsar site

Potential Impact Source	Pathway to European Site(s)	Potential for Effects on Receptor(s)*	European Sites Within Potential Zone of Influence
Waterborne pollution of habitats supporting qualifying species.	There is a hydrological connection between the Development Site and the Sound of Gigha SPA via the Clachaig Water and the Killean Burn. The Inner Hebrides and the Minches SAC is also connected by the same watercourses but the boundary of this site is more than 8km north of the point where the Killean Burn discharges into the sea (and further from the Clachaig Water). The nearest loch to the Development Site is Loch na Naich, which is approximately 750m from the access track. Loch na Naich and all other lochs further afield are not connected to the Proposed Development via any watercourse. There is no hydrological connection to any other European site.	In a straight line, the Sound of Gigha SPA is approximately 645m from the access track and 1.25km from the main Development Site. Following the courses of the Killean Burn or the Clachaig Water, these distances are longer. Given a) the intervening distance; b) the extremely large dilution effect of the sea; c) that the Proposed Development is a wind farm and not an industrial facility or such like that could be capable of producing highly toxic and/or great quantities of pollutants; and, d) the fact that the qualifying bird species are mobile and can use alternative very extensive marine habitat elsewhere, there is no possibility that any pollution event (which would in any event only arise in an accidental situation rather than as an inevitable outcome of the Scheme) will have a significant effect on the European site. The same factors apply to the Inner Hebrides and the Minches SAC which is located even further from the Proposed Development. Given that there is no direct hydrological connection between the Proposed Development and any freshwater loch (i.e. via a watercourse), any polluted water from construction works would need to flow over the ground surface. With an intervening distance of at least 750m,	None

Potential Impact Source	Pathway to European Site(s)	Potential for Effects on Receptor(s)*	European Sites Within Potential Zone of Influence
		there would be a substantial amount of natural filtration through vegetation before any water reached a loch. Additionally, the hilly topography ensures that there is generally no downslope route for pollutants to reach freshwater lochs. It is therefore unlikely that water would reach a freshwater loch but, even if it did, it would have been naturally filtered through vegetation such that pollutants would have been removed.	
Airborne pollution of habitats supporting qualifying species. This could occur due to vehicle movements and other construction activities generating dust, or as a result of emissions from fossil fuel-powered vehicles, plants and machinery.	The Institute of Air Quality Management (IAQM) state that it is commonly accepted that the greatest impacts from dust will be within 100m of a source, but that intermediate particles may disperse up to 400m. Smaller particles have the potential to disperse beyond 400m but with minimal significance due to dispersion. The IAQM therefore advises that assessment of the impacts of dust on ecological features is only likely to be required up to 400m from a source (IAQM, 2016). There are no European sites within this distance.	At the distances involved, there is no potential for direct effects on any European site as a result of airborne pollution. Dust and/or other emissions generated during the construction phase are likely to be minimal, even without mitigation, and are highly unlikely to significantly affect any habitat outside of the boundary of any European site which may represent functionally-linked habitat. Construction-related traffic is likely to constitute on average 200 vehicle movements per day and would be for a relatively short duration (12-18 months) while the Proposed Development was constructed. In contrast, the	None

Potential Impact Source	Pathway to European Site(s)	Potential for Effects on Receptor(s)*	European Sites Within Potential Zone of Influence
	Studies quoted in Smithers et al (2016) suggest that the impacts from nitrogen oxides (NOx) and nitrogen dioxide NO_2 on vegetation communities are greatest within the first 50 to 100m from roads. However, effects on bog plants were shown by Laffray *et al* (2010) to extend up to 300m from a road, but again there are no European sites within these distances.	current system of nitrogen and acid critical loads assume decades of continuous exposure[2].	
Disturbance of qualifying species as a result of increased noise, artificial lighting and/or the presence of personnel, plant and machinery.	Harbour porpoise and the wintering seabirds of the Inner Hebrides and the Minches SAC and the Sound of Gigha SPA, respectively, will be at closest approximately 645m from the Development Site. The closest point of the Proposed Development to the marine environment used by these species is the main access track, which will only require relatively minor construction works and upgrading of the existing track. The Kintyre Goose Roosts SPA / Ramsar Site is at closest 2.45km from the Development	There is no potential for disturbance of the qualifying species of the Inner Hebrides and the Minches SAC or the Sound of Gigha SPA, which at closest would be 645m from the nearest construction works. At 2.45km distant from the Development Site, there is no potential for construction works to cause disturbance of Greenland white-fronted geese present within the boundary of the Kintyre Goose Roosts SPA / Ramsar site. However, birds present outside of these designations could be subject to construction-related disturbance, either when foraging or roosting.	Kintyre Goose Roosts SPA and Ramsar site

[2] '*Typically, critical loads relate to the potential effects over periods of decades… critical loads provide the long-term deposition* [emphasis added] *below which we are sure that adverse ecosystem effects will not occur*', source: page 220, World Health Organization. 2000. Air Quality Guidelines for Europe. WHO Regional Publications, European Series, No. 91. Second Edition.

Potential Impact Source	Pathway to European Site(s)	Potential for Effects on Receptor(s)*	European Sites Within Potential Zone of Influence
	Site. However, as noted above, the Proposed Development lies within the core foraging range of Greenland white-fronted geese belonging to the Kintyre Goose Roosts SPA / Ramsar site. In addition, Greenland white-fronted geese are also known to roost on lochs not included within the SPA / Ramsar site designation (see Section 5.1).		
Operational Phase			
Waterborne pollution of habitats supporting qualifying species.	As described for the construction phase.	As described for the construction phase.	None
Disturbance of qualifying species as a result of increased noise, artificial lighting and/or the presence of personnel, plant and machinery.	As described for construction phase.	Although the pathway for effects is as described for the construction phase, the levels of disturbance caused during the operational phase will be considerably lower than during construction. Operational maintenance activities will be infrequent and will involve small numbers of personnel, typically working within the turbines. There is therefore no potential for significant disturbance effects from these activities.	None
Risk of collision with operational turbines.	Greenland white-fronted geese flying through the operational wind farm would be at risk of	Mortality of Greenland white-fronted geese due to collision with operational turbines. An increased rate of	Kintyre Goose Roosts SPA and Ramsar site

Potential Impact Source	Pathway to European Site(s)	Potential for Effects on Receptor(s)*	European Sites Within Potential Zone of Influence
	collision with moving turbines. The Development Site lies within the core foraging range of birds using the Kintyre Goose Roosts SPA and Ramsar site.	mortality above that which would occur naturally could have significant effects on the size and viability of the SPA / Ramsar site population.	
Decommissioning Phase			
All potential impacts will be as described for the construction phase (with the exception of any loss of habitat).	As described for the construction phase.	As described for the construction phase.	Kintyre Goose Roosts SPA and Ramsar site (with respect to the potential for disturbance of Greenland white-fronted geese using functionally-linked habitat only)
Restoration Phase			
All potential impacts will be as described for the construction phase (with the exception of any loss of habitat).	As described for the construction phase.	As described for the construction phase.	Kintyre Goose Roosts SPA and Ramsar site (with respect to the potential for disturbance of Greenland white-fronted geese using functionally-linked habitat only)

Potential Impact Source	Pathway to European Site(s)	Potential for Effects on Receptor(s)*	European Sites Within Potential Zone of Influence

** Receptors here means any qualifying feature of a European site or any other ecological feature (including other habitats, species or ecological processes) which support a qualifying feature.*

4.1.7 On the basis of the above, **the following impacts have been screened out of further assessment** because there is clearly no potential for them to occur or because any such impacts would clearly not result in any significant effects:

- Direct loss of habitat from within the boundary of any European site,
- Waterborne pollution of any European site, and
- Airborne pollution of any European site.

4.1.8 It is also possible to screen out of further assessment the Sound of Gigha SPA and the Inner Hebrides and the Minches SAC as there are clearly no possible impacts on these sites which could arise from the Proposed Development and result in significant adverse effects.

4.1.9 The only potential impacts identified which could result in LSE relate to the Kintyre Goose Roosts SPA and Ramsar site and are as follows:

- Loss of functionally-linked habitat used by Greenland white-fronted geese outside of the SPA / Ramsar site boundary during construction,
- Disturbance of Greenland white-fronted geese using functionally-linked habitat during construction, decommissioning and/or restoration, and
- Collision of Greenland white-fronted geese with operational wind turbines.

4.1.10 The remainder of this document considers the potential for these impacts to result in significant effects on the integrity of the Kintyre Goose Roosts SPA and Ramsar site.

5. Baseline Conditions

5.1 Kintyre Goose Roosts SPA and Ramsar site

5.1.1 All of the information provided below applies to both the Kintyre Goose Roosts SPA and the associated Ramsar site. However, as noted in Table 4-1, although the Ramsar site covers the five hill lochs encompassed by the SPA designation, it does not include the area of grassland and heath at Rhunahaorine Point.

5.1.2 The location of the Kintyre Goose Roosts SPA and Ramsar site in relation to the Proposed Development is shown on Figure 3: European Sites within 10km of the Development Site. They are multi-part designations covering five separate hill lochs and (in the case of the SPA only) an area of grassland and heath at Rhunahaorine Point. The total area of the SPA is 412.4ha, according to the citation document (https://sitelink.nature.scot/site/8518).

5.1.3 In addition to the five lochs encompassed by the SPA / Ramsar site, the Greenland white-fronted geese belonging to the SPA / Ramsar site also roost in several other locations on the Kintyre peninsula, but do so more sporadically, and not in numbers that are nationally important.

5.1.4 The SPA qualifies under Article 4.1 of the EU Directive on the Conservation of Wild Birds 79/409/EEC ('the Birds Directive') by regularly supporting an internationally important wintering population of Greenland white-fronted goose. According to the SPA citation, the 1991/92 to 1995/96 winter peak mean was 2,300 birds within the SPA site. That represents approximately 8% of the total world population and 16% of the British population.

5.1.5 However, more recent population estimates are available from the Greenland White-fronted Goose Study. Count data are presented in Fox *et al* (2019) for sites referred to as 'Mhoine Mhor', 'Rhunahaorine', 'Machrihanish', 'Clachan', and 'Gigha' (all of which are on (or in the case of Gigha, immediately adjacent to) the Kintyre peninsula). The combined peak count for these sites in spring 2019 was 2,521 birds. This provides a more contemporary estimate of the potential population of the Kintyre Goose Roosts SPA / Ramsar site.

5.1.6 There are two main populations within the SPA / Ramsar site: one which feeds on improved agricultural land around Rhunahaorine Point, with significant roosts on Rhunahaorine Point, Loch an Fhraoich and Loch Garrasdale; and another which feeds on improved agricultural land in the Laggan area, with significant roosts on Loch Lussa, Tangy Loch and Black Loch.

5.1.7 There are currently no identified negative pressures on the Greenland white-fronted goose population within the SPA.

5.1.8 The conservation objectives of the Kintyre Goose Roosts SPA are:

- To avoid deterioration of the habitats used by Greenland white-fronted goose, or significant disturbance of this species, thus ensuring the integrity of the site is maintained, and
- To ensure for Greenland white-fronted goose that the following are maintained in the long-term:
  - Population of the species as a viable component of the site,
  - Distribution of the species within the 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.

5.2 Field Survey

Field Survey Methods

5.2.1 Ornithology field surveys were carried out at and around the Development Site between 2014 and 2021. Surveys were initially conducted between March 2014 and April 2016 to inform the EIA conducted form the Consented Development (the '**2016 EIA**'). Subsequently, field surveys were completed between April 2018 and August 2021 for the Proposed Development. However, as the design of the Proposed Development has involved only minor changes to the layout assessed by the 2016 EIA, ornithological field survey has been consistent throughout the period 2014 to 2021, covering the same (or broadly similar) areas and following the same methodologies.

5.2.2 All ornithology survey completed at the Development Site has followed the *Recommended bird survey methods to inform impact assessment of onshore wind farms* (SNH, 2017).

5.2.3 The only surveys carried out during the non-breeding season (when Greenland white-fronted geese are present within the SPA / Ramsar site) were vantage point (VP) watches. VP surveys were carried out across two full non-breeding seasons (i.e. between September and February, inclusive), in 2015/16 and 2018/19. In addition, VP surveys were also completed across the majority of the 2014/15 non-breeding season (November 2014 to February 2015, inclusive).

5.2.4 A detailed description of the VP survey methodology is provided in Appendix A. However, in summary, VP surveys followed the methods described in SNH (2017). The surveys were carried out during daylight hours, including around sunrise and sunset, at which Greenland white-fronted geese may be more active. Each survey lasted for a maximum of three hours, with a minimum of thirty minutes break between each three-hour survey. VP surveys were carried out from three different VP locations at any one time, with a target minimum of six hours of survey completed from each VP per month.

5.2.5 Any flights by Greenland white-fronted geese observed during VP surveys were recorded, including information on the number of birds, flight start time, estimated height of the birds and any other relevant notes.

Field Survey Results – Habitats

5.2.6 The habitat within the Development Site is predominantly commercial conifer plantation dominated by Sitka spruce *Picea sitchensis.*

5.2.7 Outside the plantation, blanket bog is the most common habitat. For the most part it is intact. The most frequent type is dominated by thick heather *Calluna vulgaris* and hare's-tail cottongrass *Eriophorum vaginatum*, with a more limited diversity and abundance of sphagnum mosses in which *Sphagnum papillosum* is scarce and *Sphagnum capillifolium* the most common, and other large mosses of acid conditions abundant. This corresponds to the National Vegetation Classification (NVC) type M19, which is a drier more boreal bog type.

5.2.8 Heathland mostly occurs within the Development Site as wet heath of NVC type M15, and mostly as the typical sub-community M15b, which is a very common vegetation type in western Scotland. In this case, it is usually dominated by heather and purple moor-grass *Molinia caerulea*, with frequent to abundant cross-leaved heath *Erica tetralix*. It is normally not species-rich, although there is occasionally bog asphodel *Narthecium ossifragum*. It occurs most frequently along plantation rides (where it is sometimes on deep peat constituting degraded blanket bog) and on more steeply sloping ground on the open moorland. Dry heath is much more localised on the open moorland.

5.2.9 Within the open moorland, and in places along plantation rides, there are flushes dominated by rushes *Juncus* sp. These are mostly acidic and species-poor with *Sphagnum* spp. and/or the moss *Polytrichum commune*, corresponding to NVC type M6. Very locally within the open bog there is also basic flush, also rush-dominated but more species-rich, including dioecious sedge *Carex dioica*, and corresponding to NVC type M10.

5.2.10 Marshy grassland, bracken *Pteridium aquilinum* and very locally acid grassland and scrub occur along the plantation rides, but such habitats are scarce on the open moorland.

Field Survey Results – Flight Activity

5.2.11 Between 2014 and 2016, sixteen Greenland white-fronted goose flights were recorded. The maximum flock size from these flights was 60 birds, with the smallest being eight birds. The total number of birds involved in the sixteen flights was 487 individuals[3].

5.2.12 The majority of these were flights made in an easterly or westerly direction to the south of the Development Site boundary, with birds likely commuting between coastal feeding areas and a roosting loch (the nearest of which to the Development Site is Loch an Fhraoich). Three of the recorded flights were to the north of the Development Site boundary, all heading west. A further two flights were recorded just inside the boundary of the Development Site, approximately 415m from the nearest proposed turbine (T02).

[3] Used in this context the term 'individual' provides an indication of the level of flight activity by a particular species (in this case Greenland white-fronted goose) recorded by VP survey. The term 'individual' when used in this capacity does not necessarily mean different birds. Rather, 'individual' is used to illustrate the number of birds recorded in a single flight observation. For example, a flight by two birds would represent one flight, involving two individuals. The same two birds recorded together later in the same survey would represent another one flight, involving two individuals. The total for that survey would therefore be two flights involving four individuals, even though only two different birds were present. In summary, therefore, the number of 'individuals is not necessarily a reflection of the number of different birds but is a reflection of the level of flight activity by a particular species.

5.2.13 Between 2018 and 2021 no Greenland white-fronted goose flight activity was recorded.

5.2.14 All recorded Greenland white-fronted goose flights are illustrated on Figure 4: Greenland White-fronted Goose Flights (HRA).

5.3 Collision Risk Modelling

5.3.1 The Band Collision Risk Model (CRM) (Band *et al*, 2007) is typically used to estimate the collision risk for key species when assessing the potential effects of new wind farm developments.

5.3.2 However, as there were no recorded Greenland white-fronted goose flights within 400m of any of the proposed wind turbine locations, CRM could not be carried out for this species in relation to the Proposed Development.

5.3.3 As a consequence, the predicted collision mortality of Greenland white-fronted geese, based on the data collected by VP surveys, is zero.

6. Test of Likely Significant Effects

6.1 Overview

6.1.1 This section considers further the likely significant effects which could arise on Kintyre Goose Roosts SPA / Ramsar site due to the potential impacts of the Proposed Development, at all phases, which were not already screened out in Section 4. It therefore assesses, based on the information provided previously in this document, the likelihood that loss of functionally-linked habitat, disturbance of birds using functionally-linked habitat and/or white-fronted goose collisions with operational turbines could significantly affect the SPA / Ramsar site population.

6.1.2 In addition, consideration is also given to the potential for other plans or projects to act in-combination with the Proposed Development to give rise to likely significant effects on Kintyre Goose Roosts SPA / Ramsar site.

6.2 Loss of Functionally-Linked Habitat for Greenland White-fronted Goose

6.2.1 Greenland white-fronted geese historically fed on peatlands in Scotland, but the species now increasingly also forages on open farmland, typically that which is under low intensity management and especially unimproved pasture, but also including intensively managed reseeded grassland. They also feed on stubble in autumn and root crops in midwinter (Forrester *et al*, 2007).

6.2.2 The species roosts on small hill lochs and lochans, and birds may continue to use associated bog / peatland habitat at night for feeding and roosting (Forrester *et al*, 2007).

6.2.3 Only turbines T01 and T03 are situated on open moorland habitat, with the crane pad for T04 extending into this area (although the majority of the associated infrastructure for T04 will instead be located immediately adjacent to this area, in plantation forest which will be clear-felled). Borrow pit BP06 is also located within this open moorland area. The main access track crosses an area of open bog immediately adjacent to the northern edge of the main Development Site, but this follows a substantial existing forestry access track which would require minimal upgrade. T13 is also in bog habitat but this is located within a larger clearing within the plantation forest which is nevertheless too small and too enclosed to be suitable for use by Greenland white-fronted geese. Consequently, there is only potential for appreciable loss of functionally-linked habitat associated with T01 and T03, T04 to a small extent and the associated access track. The total area of loss of this habitat is approximately 2.57ha.

6.2.4 This is a very small area relative to the wider blanket bog resource within the core foraging range of Greenland white-fronted geese from roosting lochs, which is estimated by NatureScot to be between 5 and 8km (SNH, 2016). The loss of this habitat, if used by Greenland white-fronted geese, would therefore be a very small proportion of the overall availability of such habitat.

6.2.5 However, irrespective of the above, no Greenland white-fronted geese have ever been recorded in this area during ornithological survey. The location of VP3 was on the slopes of Cnoc Odhar Auchaluskin, and directly overlooked the area of bog habitat at T01 and T03 (see Figure 5: Vantage Point Locations and Viewsheds). Despite surveying from this position throughout the winter periods of 2015/16 and 2018/19, as well as the majority of the 2014/15 winter, no Greenland white-fronted geese were recorded.

6.2.6 The area around T01 and T03 is not situated in proximity to any known roosting loch used by Greenland white-fronted geese. The nearest associated with the Kintyre Goose Roosts SPA / Ramsar site is Loch an Fhraoich, approximately 4.5km north-east of T01, and the nearest non-designated loch is Loch na Naich, approximately 2km from these turbines. Although this species uses bog habitat at night for feeding and roosting, this is understood to be in the vicinity of roosting lochs (Forrester *et al*, 2007). It is consequently very unlikely that the area around T01 and T03 would be used by Greenland white-fronted geese during the night given the distance to the nearest lochs which could be used for roosting.

6.2.7 In summary:

- The only infrastructure associated with the Proposed Development which is sited on open moorland habitat (not including bog crossed by the main access track which follows a substantial existing forestry track) is turbines T01 and T03, a section of the crane pad associated with turbine T04, borrow pit BP06 and the associated access track sections. The total loss of habitat from the construction of these elements of the Proposed Development will be approximately 2.57ha. This is a very small proportion of the area of bog habitat in the wider landscape which is within the core foraging range of Greenland white-fronted geese,
- Irrespective of the above, Greenland white-fronted geese have never been recorded in this area and it is therefore considered that they do not use this habitat, and
- Further justification for the above is provided by the fact that the area around T01 and T03 is not located in proximity to any roosting loch, and is consequently not likely to be used by Greenland white-fronted geese at night.

6.2.8 It is therefore concluded that there will be no loss of functionally-linked habitat and no likely significant effect on the Kintyre Goose Roosts SPA / Ramsar site.

6.3 Disturbance of Greenland White-fronted Geese Using Functionally-linked Habitat During Construction, Decommissioning and/or Restoration

6.3.1 As set out in Table 4-2, at closest the Development Site is 2.45km from the nearest part of the Kintyre Goose Roosts SPA / Ramsar site (Loch an Fhraoich). This is well beyond the distance at which disturbance can realistically be expected to occur and it is therefore concluded that there is no potential for such impacts on birds within the boundary of the designated sites. This section therefore only considers the potential for disturbance of birds using functionally-linked habitat outside of the site boundaries.

6.3.2 As described in Paragraph 6.2.3, the only elements of the Proposed Development which are sited on open moorland habitat are turbines T01 and T03, a section of the crane pad for turbine T04, borrow pit BP06, plus the associated sections of access track. Turbine T04 is largely located on the edge of this moorland area in plantation forestry which will be clear-felled. The next nearest infrastructure to an area of open bog is turbine T06, situated in what will be clear-felled forestry approximately 150m from the moorland area within which T01 and T03 are located.

6.3.3 No specific information on the distances at which Greenland white-fronted geese may be disturbed by construction activities were found during this HRA screening exercise. However, Cutts *et al* (2013) suggest that for Brent geese *Branta bernicla*, which they state are "*highly sensitive*" to disturbance, such impacts may occur at distances of 105m for foraging birds and 205m for roosting birds.

6.3.4 Therefore, even if Greenland white-fronted geese were to occur in open bog habitat around turbines T01 and T03, disturbance would be expected only from works associated with those turbines, turbine T04, borrow pit BP06 and a small part of the wider Proposed Development infrastructure; perhaps extending to including turbine T06 and borrow pit BP04. This would potentially displace birds from a very small area of potentially suitable habitat which, as set out above, would represent an extremely small proportion of the wider resource in the surrounding area.

6.3.5 However, irrespective of the above and as also set out in Paragraph 6.2.5, no Greenland white-fronted geese have ever been recorded in this area and it is considered that they do not use it.

6.3.6 Therefore, it is concluded that there will be no impact from disturbance of Greenland white-fronted geese either within the SPA / Ramsar site boundary, or using functionally-linked land, and there will be no likely significant effects on the Kintyre Goose Roosts SPA / Ramsar site.

6.4 Collision of Greenland White-fronted Goose with Operational Turbines

6.4.1 There were no flights by white-fronted geese within 400m of any proposed turbine location during almost three full winters of VP survey between 2014 and 2019. The risk of collision mortality based on these results is therefore concluded to be zero.

6.4.2 Population modelling carried out by Trinder (2015) estimated that the risk of a decline in the Kintyre Greenland white-fronted goose population would exceed 10% when an additional 0.6% of the population was killed per year (under the most conservative modelling parameters used). Taking the population estimate of 2,521 birds presented in Paragraph 5.1.5, this would be approximately fifteen birds per year. It is very unlikely that future changes in Greenland white-fronted goose flight activity would result in the Proposed Development causing the predicted collision mortality of zero to rise to fifteen Greenland white-fronted geese per year.

6.4.3 Furthermore, NatureScot recommend that an avoidance rate of 99.8% be applied for Greenland white-fronted geese when assessing the risk of collision with operational turbines

(SNH, 2018). Therefore, it can be expected that in the presence of the operational turbines, Greenland white-fronted geese would continue to avoid the Development Site either completely or in the vast majority of instances.

6.4.4 Therefore, it is concluded that there will be no impact from Greenland white-fronted goose mortality due to collision with operational wind turbines, and there will be no likely significant effects on the Kintyre Goose Roosts SPA / Ramsar site.

6.5 Other Plans or Projects That May Act 'In Combination'

6.5.1 Cumulative (in-combination) effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location (CIEEM, 2018). No pathways of impact between the Proposed Development and any European sites have been identified. This means that there is no scope for an in-combination to effect exist, as the conclusion is not that the effects of the Proposed Development are insignificant, but that no effects will arise at all.

6.5.2 This includes the risk of collision mortality with operational wind turbines, which is predicted to be zero on the basis of the field survey data collected. Therefore, although other wind farms on the Kintyre peninsula, or more widely across the Argyll West and Islands Natural Heritage Zone (NHZ)[4], may have been assessed as posing some risk of collision mortality for this species, the Proposed Development will not result in any additional risk which could otherwise increase the likelihood of a decline in the population of the Kintyre Goose Roosts SPA / Ramsar site.

6.5.3 Construction of the Proposed Development is anticipated to commence in 2023/24. Prior to the commencement of construction, the majority of the conifer plantation woodland within which the Proposed Development is sited, with the exception of small areas around turbines T02, T04, T05, T06, T08, T10, T11 and T13, is scheduled be clear felled by FLS. This is being undertaken for timber harvesting purposes as part of the planned commercial management of the forest, as set out in the updated Carradale Land Management Plan (FLS, *unpublished*), covering the Development Site. The Applicant will be responsible for clear felling any additional areas of forestry not cleared by FLS.

6.5.4 Following the completion of construction activities and all necessary tree felling by FLS, the Applicant will fund the restoration of 56.2 ha of peatland within the Development Site (see Figure 17.5: Baseline Restock Species Composition; EIAR Volume 2b). This is partly to deliver planned habitat enhancement works proposed by FLS, and partly to compensate for effects on peat habitats caused by the Proposed Development. Although peatland habitats may be used by Greenland white-fronted geese (as described in Paragraph 6.2.1), it is not likely that these areas will be used for many years, as dictated by the timescales required for successful restoration of bog habitats. Moreover, as also set out in Section 6.2 of this document, there is no evidence of Greenland white-fronted geese using existing bog habitats in the vicinity of the Development Site.

[4] NatureScot has devised 21 NHZs covering the whole of Scotland, which reflect biogeographical differences across the country.

6.5.5 The tree felling and peatland restoration works being delivered by FLS (funded in part by the Applicant) across the Development Site will therefore not result in any impacts not already assessed and there is no possibility for in-combination effects with the Proposed Development.

6.5.6 It is therefore concluded that there is no potential for in-combination effects to occur between the Proposed Development and any other plan(s) or project(s).

7. Conclusion

7.1.1 There are no European sites located more than 10km from the Proposed Development that could be subject to likely significant effects.

7.1.2 Likely significant effects on the qualifying features of the Sound of Gigha SPA and Inner Hebrides and the Minches SAC, which are both within 10km of the Proposed Development, are screened out as there are clearly no possible impacts on these sites which could arise from the Proposed Development and result in significant adverse effects.

7.1.3 The following potential impacts could arise on the Kintyre Goose Roosts SPA and Ramsar site and have been considered:

- Loss of functionally-linked habitat used by Greenland white-fronted geese outside of the SPA / Ramsar site boundary during construction,
- Disturbance of Greenland white-fronted geese using functionally-linked habitat during construction, decommissioning and/or restoration, and
- Collision of Greenland white-fronted geese with operational wind turbines.

7.1.4 However, none of these impacts has the potential to result in LSE because no functionally-linked habitat used by Greenland white-fronted geese exists within the zone of influence of the Proposed Development, and because the predicted collision mortality with operational wind turbines is zero owing to an observed lack of Greenland white-fronted geese flights within 400m of proposed turbine locations.

7.1.5 Owing to a lack of any effect from the Proposed Development on European sites, and also a lack of any effect on European sites from proposed peatland restoration of forestry in the vicinity of the Proposed Development, there is also no possibility of any cumulative (in-combination) effect with other plans or projects.

7.1.6 This HRA Screening Report therefore concludes that there are no likely significant effects on any European site as a result of the Proposed Development, either alone or in-combination with other plans or projects, and therefore that there is no requirement to proceed to the next step of appropriate assessment. Subject to other requirements, the Proposed Development can therefore be authorised.

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Appendix A

Appendix A Vantage Point Surveys

A.1 Introduction

A.1.1 This Appendix provides details of the vantage point (VP) surveys carried out at the Development Site between November 2014 and August 2020.

A.2 Vantage Point Surveys

Survey Effort

A.2.1 Vantage point survey was completed from three locations between November 2014 and April 2016. Approximately nine hours of survey per month were completed from each VP during this period, resulting in a total of 485 hours of observation. The location of VP1 was moved by approximately 430m in April 2015, giving a slightly smaller but broadly similar viewshed to the original location. The original location of VP1 is therefore referred to as VP1a, while the second altered location, which was used until surveys were completed in 2020, is referred to as VP1b. A total of 165.5 hours were carried out from VP1a/1b, 156.3 hours from VP2 and 163.3 hours from VP3.

A.2.2 In 2018, VP surveys were initially carried out from two of the three locations used between 2014 and 2016 (VP1b and VP3). From August 2018, a new VP location was adopted to capture additional golden eagle activity. This location is referred to as VP2b, while the location used between 2014 and 2016 but which was dropped in 2018 is referred to as VP2a. The area covered by the viewshed of VP2b was entirely different from that covered by VP2a. Six hours of survey per month were completed from each of VP1b and VP3 between April and July 2018, inclusive. From August 2018, this was increased to at least nine hours per month from each of VP1b, VP3 and VP2b. In total, 271 hours of survey were completed between April 2018 and February 2019, comprising 99 hours from VP1b, 76 hours from VP2b and 96 hours from VP3.

A.2.3 In 2020, six hours per month were completed from each of VP1b, VP2b and VP3, giving a total of 108 hours of observation.

A.2.4 Full details of the VP survey effort between 2014 and 2020 is provided in Table A-1. The locations of VP1a, VP1b, VP2a, VP2b and VP3, and their associated viewsheds, are shown on Figure 5 (HRA).

Table A-1 Details of Vantage Point Watches, November 2014 to August 2020

Date	VP	Start Time	End Time	Wind Speed			Wind Direction			Rainfall			Cloud Cover			Cloud Height			Visibility		
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
21/11/2014	1a	10:10	13:10	4	4	5	E	E	E	0	0	0	8	8	8	2	2	2	2	2	2
21/11/2014	1a	13:40	16:40	4	4	5	E	E	E	0	0	2	8	8	8	2	2	2	2	2	2
22/11/2014	3	10:00	13:00	4	4	4	SW	SW	SW	0	0	3	7	7	8	2	2	1	2	2	2
22/11/2014	3	13:30	16:45	3	3	2	SW	SW	SW	2	0	3	7	5	5	2	2	2	2	2	2
23/11/2014	1a	08:20	11:20	3	3	3	SW	W	W	0	0	0	5	5	5	2	2	2	2	2	2
23/11/2014	3	13:00	16:00	3	3	3	W	W	W	2	2/3	0	7	7	5	2	2	2	2	2	2
26/11/2014	2a	09:00	12:30	3	3	3	E	E	E	0	0	0	5	3	3	2	2	2	2	2	2
26/11/2014	2a	13:00	16:30	2	3	2	E	E	E	0	0	0	5	3	1	2	2	2	2	2	2
06/12/2014	2a	10:30	13:30	4	4	5	W	W	W	0	2	2	7	8	8	2	2	1	2	2	2
06/12/2014	2a	14:00	16:00	5	5		W	W		2	0		8	8		2	2		2	2	
07/12/2014	3	10:15	13:15	5	5	6	W	W	W	0	0/3	0/3	5	7	7	2	2	2	2	2	2
07/12/2014	2a	13:45	16:45	5	4	4	W	W	W	3	0	3	7	5	7	2	2	2	2	2	1
08/12/2014	3	10:15	13:15	4	4	3	NW	NW	N	0/3	0/3	0/3	7	5	7	2	2	2	2	2	2
08/12/2014	3	13:45	16:45	4	3	3	NW	NW	NW	0/2	0	0/2	8	8	8	2	2	2	2	2	1
09/12/2014	3	08:30	11:30	5	5	5	SSW	SSW	SSW	0	2	2/3	7	7	7	2	2	2	2	2	1
09/12/2014	1a	12:55	15:55	5	5	5	SSW	SSW	SSW	2	2	3	8	8	8	2	2	1	2	2	1
10/12/2014	1a	09:30	11:30	6	6	6	W	W	W	0/2/3	2	0	7	5	5	2	2	2	2	2	2
10/12/2014	1a	11:50	15:50	2	2	2	W	W	W	0	0	0	8	8	8	2	2	2	2	2	2
19/01/2015	3	10:30	13:30	2	3	3	SE	SE	SE	0	0	0	1	3	3	2	2	2	2	2	2
19/01/2015	3	14:30	17:30	3	3	3	ESE	ESE	ESE	0	0	0	5	5	5	2	2	2	2	2	2

Date	VP	Start Time	End Time	Wind Speed			Wind Direction			Rainfall			Cloud Cover			Cloud Height			Visibility		
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
20/01/2015	2a	10:00	13:00	4	4	4	SE	SE	SE	0	0	0	7	7	7	2	2	2	2	2	2
20/01/2015	2a	13:30	16:45	4	4	4	SSE	SSE	SSE	0	2	2	7	8	8	2	1	1	2	1	1
21/01/2015	2a	08:15	11:15	3	3	3	SSE	SSE	SSE	0	0	0	1	3	1	2	2	2	2	2	2
21/01/2015	3	13:00	16:00	3	2	3	SSE	SSE	SSE	0	0	0	3	3	3	2	2	2	2	2	2
22/01/2015	1a	10:05	13:05	3	3	2	SE	SE	SE	0	0	0	1	3	1	2	2	2	2	2	2
22/01/2015	1a	13:20	16:50	3	3	3	SE	SE	SE	0	0	0	1	1	1	2	2	2	2	2	2
23/01/2015	3	10:00	12:30	4	4		SW	SW		0	0		7	7		2	2		2	2	
23/01/2015	3	12:50	14:50	4	4		W	W		2	2		8	8		2	2		2	2	
09/02/15	1a	10:45	14:15	4	4	4	W	W	W	0	0	1	7	7	7	2	2	2	2	2	2
09/02/2015	1a	14:45	17:45	4	3	3	W	W	W	0	1	1	8	8	8	1	1	1	1	1	1
10/02/2015	1a	08:40	11:40	3	3		SW	SW		0	0	0	8	8		2	1		2	2	
10/02/2015	1a	12:10	14:10	3	2		SW	SW		0	0		8	8		2	2		2	2	
10/02/2015	1a	14:40	16:40	2	2		SW	SW		0	0		8	8		2	2		2	2	
11/02/2015	3	08:35	11:05	4	4		SW	SW		0	0		8	8		1	1		2	2	
11/02/2015	3	11:35	13:35	4	3		SW	W		0	0		8	7		1	2		2	2	
11/02/2015	2a	15:30	18:00	4	4	3	SW	SW	SW	0	0	0	8	8	8	2	2	2	2	2	2
12/02/2015	2a	07:15	10:15	4	4	4	S	S	S	0	0	0	8	8	7	2	2	2	2	2	2
12/02/2015	2a	10:45	14:15	4	3	3	S	S	S	0	0	0	8	8	8	2	2	2	2	2	2
05/03/2015	3	13:00	15:00	4	4		S	S		0	0		7	7		2	2		2	2	
05/03/2015	3	15:30	18:00	4	4		SSW	SSW		0	2		8	8		2	2		2	2	
06/03/2015	1a	08:05	11:05	5	5	5	S	S	S	0	0	0	8	8	8	2	2	2	2	2	2
06/03/2015	1a	11:35	14:35	5	5	5	S	SSW	SSW	0	0	0	8	8	8	2	2	2	2	2	2

Date	VP	Start Time	End Time	Wind Speed			Wind Direction			Rainfall			Cloud Cover			Cloud Height			Visibility		
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
09/03/2015	3	13:10	15:10	6	6		SSE	S		0	2		8	8		2	2		2	2	
09/03/2015	3	15:40	18:10	6	6		SSW	SSW		0	0		7	7		2	2		2	2	
10/03/2015	2a	07:30	10:30	4	4	4	W	W	W	0	0	0	7	7	5	2	2	2	2	2	2
10/03/2015	2a	11:00	14:00	4	4	3	W	W	W	0	0	0	3	3	3	2	2	2	2	2	2
11/03/2015	1a	06:25	09:25	5	5	6	SSE	SSE	SSE	0	0	2	7	8	8	2	2	2	2	2	2
11/03/2015	2a	14:25	17:25	4	4	3	W	W	W	2	0	0	7	5	3	2	2	2	2	2	2
06/04/2015	3	10:05	13:05	2	3	3	W	W	W	0	0	0	3	3	1	2	2	2	2	2	2
06/04/2015	3	13:35	16:35	3	2	2	W	W	W	0	0	0	1	3	3	2	2	2	2	2	2
07/04/2015	1b	11:10	14:10	3	3	3	W	W	W	0	0	0	8	7	7	2	2	2	2	2	2
07/04/2015	1b	14:40	16:10	3	3		W	W		0	0		7	5		2	2		2	2	
08/04/2015	3	06:30	09:30	3	4	3	E	SE	E	0	0	0	3	1	1	2	2	2	2	2	2
09/04/2015	2a	06:25	09:25	3	3	3	S	S	S	0	0	0	1	1	1	2	2	2	2	2	2
09/04/2015	2a	10:00	13:00	4	4	3	S	S	S	0	0	0	1	1	1	2	2	2	2	2	2
10/04/2015	1b	09:40	12:40	4	4	4	SE	SE	SE	0	0	0	1	3	5	2	2	2	2	2	2
10/04/2015	1b	13:10	14:40	4	4		SE	SE		0	0		5	5		2	2		2	2	
10/04/2015	2a	16:25	19:25	4	3	3	SE	SE	SE	0	0	0	5	7	7	2	2	2	2	2	2
18/05/2015	1b	10:15	13:15	3	4	4	W	W	W	0	0	0	5	7	7	2	2	2	2	2	2
18/05/2015	1b	13:45	16:45	4	3	3	W	W	W	0	0	0	5	7	5	2	2	2	2	2	2
19/05/2015	1b	06:25	09:25	5	5	5	NW	NW	W	2	0	0	7	5	7	2	2	2	2	2	2
19/05/2015	2a	16:05	19:05	5	5	5	NW	NW	NW	2	0	2	7	7	7	2	2	2	2	2	2
20/05/2015	3	06:30	09:30	5	4	4	NW	NW	NW	2	0	0	7	7	7	2	2	2	2	2	2
20/05/2015	3	10:00	13:00	4	4	4	NW	NW	NW	0	0	0	7	7	5	2	2	2	2	2	2

Date	VP	Start Time	End Time	Wind Speed			Wind Direction			Rainfall			Cloud Cover			Cloud Height			Visibility		
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
21/05/2015	2a	06:25	09:25	4	3	3	W	W	W	2	2	0	8	8	7	2	2	2	2	2	2
21/05/2015	2a	09:55	12:55	3	4	4	W	W	W	0	0	2	8	8	8	2	2	2	2	2	2
22/05/2015	3	10:00	13:00	4	4	4	W	W	W	2	2	0	8	8	8	1	1	2	1	2	2
08/06/2015	1b	14:30	17:30	4	4	4	NW	NW	NW	0	0	0	3	1	1	2	2	2	2	2	2
08/06/2015	1b	18:00	21:00	4	3	3	NW	NNW	NNW	0	0	0	1	1	1	2	2	2	2	2	2
09/06/2015	3	06:55	09:55	2	2	3	NW	NW	W	0	0	0	3	5	7	2	2	2	2	2	2
09/06/2015	3	10:25	13:25	3	2	3	NW	NW	NW	0	0	0	7	5	5	2	2	2	2	2	2
10/06/2015	1b	05:10	08:10	3	3	3	NW	NW	NW	0	0	0	1	1	1	2	2	2	2	2	2
10/06/2015	3	16:05	19:05	4	3	3	NW	NW	NW	0	0	0	1	1	1	2	2	2	2	2	2
11/06/2015	2a	04:20	07:20	1	1	2	W	W	W	0	0	0	1	1	1	2	2	2	2	2	2
11/06/2015	2a	07:50	10:50	2	2	3	W	W	W	0	0	0	1	3	1	2	2	2	2	2	2
11/06/2015	2a	19:20	22:20	2	2	2	W	W	W	0	0	0	1	1	1	2	2	2	2	2	2
13/07/2015	1b	05:05	08:05	3	2	2	S	SW	W	1	1	1	8	8	8	1	1	1	1	2	2
13/07/2015	1b	14:15	17:15	3	4	3	W	W	W	0	1	0	8	8	7	2	2	2	2	2	2
14/07/2015	3	09:20	12:20	2	3	2	W	W	NW	0	0	0	7	5	5	2	2	2	2	2	2
14/07/2015	3	12:50	15:50	2	2	2	W	W	W	0	0	0	3	5	7	2	2	2	2	2	2
14/07/2015	1b	18:50	21:50	3	4	3	NW	NW	NW	0	0	0	5	7	7	2	2	2	2	2	2
15/07/2015	2a	09:45	12:45	3	3	3	NW	NW	NW	0	0	0	5	7	5	2	2	2	2	2	2
15/07/2015	2a	13:15	16:15	3	3	2	NW	NW	NW	0	0	0	3	3	3	2	2	2	2	2	2
15/07/2015	3	19:05	22:05	2	3	3	NW	NW	NW	0	0	0	3	3	3	2	2	2	2	2	2
17/07/2015	2a	05:15	08:15	4	5	5	SW	S	S	2	0	2	7	7	8	1	2	2	2	2	2

Date	VP	Start Time	End Time	Wind Speed			Wind Direction			Rainfall			Cloud Cover			Cloud Height			Visibility		
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
24/08/2015	1b	06:25	09:25	2	3	3	SE	SE	S	0	0	0	5	5	5	2	2	2	2	2	2
24/08/2015	1b	09:55	11:55	3	2	2	SE	SE	SE	0	0	0	5	5	5	2	2	2	2	2	2
25/08/2015	3	08:00	11:00	2	2	2	SW	SW	SW	0	0	0	5	3	3	2	2	2	2	2	2
25/08/2015	3	11:30	14:30	3	3	3	SSW	SW	SW	0	0	0	3	5	7	2	2	2	2	2	2
25/08/2015	1b	17:25	20:25	3	4	4	S	SSE	SSE	0	0	0	3	5	7	2	2	2	2	2	2
26/08/2015	2a	11:00	14:00	2	3	2	SW	SW	SW	2	0	0	7	5	5	2	2	2	2	2	2
26/08/2015	2a	14:30	17:30	2	3	3	SW	SW	SW	0	2	0	5	7	7	2	2	2	2	2	2
27/08/2015	2a	06:25	09:25	5	4	4	SW	SW	SW	2	2	2	8	8	8	2	2	1	2	2	1
27/08/2015	3	14:00	17:00	4	3	3	SW	SW	SW	0	0	3	5	5	8	2	2	2	2	2	2
03/09/2015	1b	07:30	10:30	4	4	5	NW	NW	NW	0	2	0	7	7	5	2	2	2	2	2	2
03/09/2015	1b	11:00	14:00	4	4	4	NW	NW	NW	0	0	0	5	7	5	2	2	2	2	2	2
03/09/2015	1b	14:30	17:30	4	4	4	NW	NW	NW	0	0	0	5	5	5	2	2	2	2	2	2
17/09/2015	2a	06:35	09:35	2	2	2	W	W	W	0	0	0	3	3	3	2	2	2	2	2	2
17/09/2015	3	10:50	13:50	2	2	3	W	W	W	0	0	0	1	3	5	2	2	2	2	2	2
17/09/2015	3	14:20	17:20	3	3	3	W	W	W	0	0	0	4	7	7	2	2	2	2	2	2
18/09/2015	3	06:30	09:30	2	2	3	N	N	N	0	0	0	1	3	3	2	2	2	2	2	2
18/09/2015	2a	10:40	13:40	2	3	2	N	N	N	0	0	0	3	3	3	2	2	2	2	2	2
18/09/2015	2a	14:10	17:10	2	3	3	N	N	N	0	0	0	3	3	3	2	2	2	2	2	2
26/10/2015	1b	11:30	14:30	5	5	6	SE	SE	SE	0	0	0	8	8	7	2	2	2	2	2	2
26/10/2015	1b	15:00	18:00	5	5	5	SE	SE	SE	0	0	0	7	7	7	2	2	2	2	2	2
27/10/2015	1b	07:00	10:00	4	5	5	E	E	E	0	0	0	5	5	5	2	2	2	2	2	2
27/10/2015	2a	11:25	14:25	4	5	5	E	E	E	0	0	0	3	5	5	2	2	2	2	2	2

Date	VP	Start Time	End Time	Wind Speed			Wind Direction			Rainfall			Cloud Cover			Cloud Height			Visibility		
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
27/10/2015	2a	14:55	17:55	4	5	5	E	E	E	0	0	0	5	5	7	2	2	2	2	2	1
28/10/2015	2a	08:05	11:05	3	3	3	E	E	E	0	2	2	8	8	8	2	2	2	2	2	2
28/10/2015	3	12:25	15:25	4	3	3	E	E	E	0	0	2	7	8	8	2	2	2	2	2	2
28/10/2015	3	15:55	17:55	3	4		E	E		0	0		8	8		1	2		2	1	
29/10/2015	3	09:15	12:15	4	4	4	WSW	WSW	WSW	0	0	0	5	3	3	2	2	2	2	2	2
29/10/2015	3	12:45	13:45	4			WSW		0			1			2			2			
09/11/2015	1b	10:55	13:55	5	5	5	SW	SW	SW	2	2	3	8	8	8	2	2	2	2	2	2
09/11/2015	1b	14:25	17:25	5	4	3	SW	SW	SW	2	3	2	8	8	8	1	1	1	2	2	1
10/11/2015	2a	07:00	10:00	5	5	5	SW	SW	SW	3	3	3	8	8	8	1	1	1	2	2	2
10/11/2015	1b	14:20	17:20	5	4	3	SW	SW	SW	2	0	0	8	8	8	1	2	1	2	2	1
11/11/2015	2a	10:55	13:55	5	4	4	SW	SW	SW	2	0	2	8	8	8	2	2	1	2	2	1
11/11/2015	2a	14:25	17:25	5	5	5	SW	SW	W	0	2	0	7	5	5	2	2	2	2	2	2
12/11/2015	3	08:00	10:00	5	6		S	S		0	0		8	8		2	2		2	2	
12/11/2015	3	10:30	12:30	5	6		S	S		0	0		7	7		2	2		2	2	
13/11/2015	3	08:20	11:20	6	5	5	W	W	W	0	2	3	7	7	7	2	2	1	2	2	2
13/11/2015	3	11:50	13:50	5	5		W	W		3	2		7	5		2	2		2	2	
07/12/2015	1b	10:10	13:10	6	6	5	SE	SE	SSE	2	2	2	8	8	8	1	1	1	1	2	2
07/12/2015	1b	13:40	16:40	5	5	5	SE	SE	S	2	0	2	8	8	8	1	1	1	2	2	1
08/12/2015	2a	09:00	11:00	5	5		SSE	SSE		0	0		6	3		2	2		2	2	
08/12/2015	2a	11:30	13:30	5	5		S	S		0	0		6	7		2	2		2	2	

Date	VP	Start Time	End Time	Wind Speed			Wind Direction			Rainfall			Cloud Cover			Cloud Height			Visibility		
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
08/12/2015	2a	14:00	17:00	5	5	4	SW	W	W	2	2	2	7	8	7	2	1	2	2	2	1
09/12/2015	2a	07:45	09:45	5	5		SSW	SSW		0	2		8	8		2	1		2	2	
09/12/2015	1b	12:10	14:10	5	6		SSW	SSW		0	2		7	8		2	2		2	2	
09/12/2015	1b	14:40	16:40	6	6		SSW	SSW		0	2		7	7		2	2		2	2	
10/12/2015	3	12:20	14:20	5	5		WSW	WSW	0	2		7	5		2	2		2	2		
10/12/2015	3	14:50	16:50	5	5		WSW	WSW	0	0		7	7		2	2		2	2		
11/12/2015	3	07:45	10:45	6	6	5	WSW	W	W	2	2	0	8	7	7	1	2	2	1	2	2
11/12/2015	3	11:15	13:15	4	5		W	W		2	0		7	7		2	2		2	2	
18/01/2016	3	09:05	11:35	5	5		SW	SW		2	2		8	8		1	1		2	2	
18/01/2016	3	12:05	14:05	5	5		SW	SW		2	2		8	8		1	1		2	2	
18/01/2016	2a	15:30	17:30	5	4		SW	SW		2	2		8	8		1	1		2	1	
19/01/2016	1b	11:00	14:00	2	2	3	E	E	E	0	0	0	8	7	7	2	2	2	2	2	2
19/01/2016	1b	14:30	17:30	3	3	3	E	E	E	0	0	0	7	8	8	2	2	1	2	2	1
20/01/2016	2a	09:30	11:30	3	3		SE	SE		2	2		8	7		1	2		1	2	
20/01/2016	2a	12:00	14:00	3	4		SE	SE		0	0		7	7		2	2		2	2	
20/01/2016	2a	14:30	17:30	3	3	3	SE	SE	SE	2	0	0	8	8	8	2	2	1	2	2	1
21/01/2016	1b	09:35	12:35	5	5	5	SE	SE	SE	2	2	2	8	8	8	1	1	1	2	2	1
22/01/2016	3	07:30	10:00	5	4		S	SW		2	2		8	7		1	2		1	2	
22/01/2016	3	10:30	12:30	4	4		SW	SW		0	0		3	1		2	2		2	2	
08/02/2016	3	09:25	12:25	4	3	4	W	W	W	2	0	2	8	5	7	2	2	2	2	2	2

Date	VP	Start Time	End Time	Wind Speed			Wind Direction			Rainfall			Cloud Cover			Cloud Height			Visibility		
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
08/02/2016	3	12:55	14:55	4	4		W	W		2	3		7	7		2	2		2	2	
08/02/2016	1b	16:10	17:40	2	3		W	W		2	0		7	7		2	2		2	1	
09/02/2016	1b	08:35	11:35	4	3	3	W	W	W	2	2	2	8	8	8	1	1	1	1	2	2
09/02/2016	1b	12:05	14:05	3	3		W	NW		0	0		7	7		2	2		2	2	
09/02/2016	1b	14:35	16:35	3	3		NW	NW		0	0		5	5		2	2		2	2	
10/02/2016	2a	13:45	15:45	3	3		NW	NW		0	0		5	5		2	2		2	2	
10/02/2016	2a	16:15	18:15	3	3		NW	NW		2	0		5	5		2	2		2	2	
11/02/2016	3	07:00	09:00	3	2		WNW	WNW	0	0		1	1		2	2		2	2		
11/02/2016	3	09:30	11:30	2	2		WNW	WNW	0	0		3	3		2	2		2	2		
12/02/2016	2a	06:50	08:50	3	3		E	E		0	0		3	3		2	2		1	2	
09/03/2016	3	16:10	19:10	3	3	3	NW	NW	NW	0	0	2	7	5	5	1	2	2	2	2	2
10/03/2016	1b	08:45	11:45	3	3	3	SE	SE	SE	0	0	0	1	1	1	2	2	2	2	2	2
10/03/2016	1b	12:15	15:15	3	2	3	SE	SE	SE	0	0	0	1	3	3	2	2	2	2	2	2
10/03/2016	1b	16:20	18:20	3	3		SE	SE		0	0		5	5		2	2		2	2	
11/03/2016	2a	05:55	08:55	3	3	3	SE	SE	SSE	0	2	2	7	7	8	2	2	2	2	2	2
11/03/2016	2a	09:25	12:25	3	3	3	SSE	SSE	SSE	2	2	2	8	8	8	2	2	2	2	2	2
15/03/2016	1b	15:00	18:00	3	3	4	ENE	ENE	ENE	0	0	0	3	3	3	2	2	2	2	2	2
16/03/2016	2a	15:40	18:40	3	3	3	E	E	E	0	0	0	3	5	3	2	2	2	2	2	2
17/03/2016	3	12:25	14:25	2	2		S	SW		0	0		3	1		2	2		2	2	
17/03/2016	3	14:55	16:55	2	2		W	W		0	0		3	3		2	2		2	2	

Date	VP	Start Time	End Time	Wind Speed			Wind Direction			Rainfall			Cloud Cover			Cloud Height			Visibility		
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
04/04/2016	2a	05:55	08:55	3	3	3	NW	NW	NW	2	2	2	8	8	8	2	2	2	2	2	2
04/04/2016	1b	11:00	14:00	3	3	3	NW	NW	W	2	2	2	8	8	8	2	2	2	2	2	2
04/04/2016	1b	14:30	17:30	3	3	3	N	N	N	2	2	0	8	8	8	2	2	2	2	2	2
05/04/2016	3	05:55	08:55	4	3	3	W	W	W	2	2	0	8	8	8	1	2	2	2	2	2
05/04/2016	2a	12:15	15:15	3	3	3	W	W	NW	2	0	0	7	5	5	2	2	2	2	2	2
05/04/2016	2a	15:45	18:45	3	3	3	W	W	W	0	0	0	3	5	5	2	2	2	2	2	2
06/04/2016	3	09:30	12:30	4	4	4	W	W	W	3	3	3	8	8	8	2	2	2	2	2	2
06/04/2016	3	13:00	16:00	3	3	3	W	W	W	0	2	2	7	8	8	2	2	2	2	2	2
06/04/2016	1b	18:08	21:08	3	3	3	W	W	W	2	0	0	7	7	7	2	2	2	2	2	2
25/04/2018	3	06:25	09:25	3	3	3	SW	SW	SW	0	0	0	7	6	5	2	2	2	2	2	2
25/04/2018	3	09:55	12:55	3	3	4	SW	SW	SW	0	0	0	5	7	4	2	2	2	2	2	2
25/04/2018	1b	12:30	15:30	3	3	3	SW	SW	SW	2	2	0	7	5	5	2	2	2	2	2	2
25/04/2018	1b	16:00	19:00	3	4	4	SW	W	W	0	0	0	7	7	7	2	2	2	2	2	2
30/05/2018	1b	05:30	08:30	4	4	3	E	E	E	0	0	0	1	1	1	2	2	2	2	2	2
30/05/2018	1b	09:00	12:00	3	3	3	E	E	E	0	0	0	1	1	1	2	2	2	2	2	2
30/05/2018	3	12:20	15:20	3	3	3	ENE	ENE	ENE	0	0	0	1	1	1	2	2	2	2	2	2
30/05/2018	3	15:50	18:50	3	3	3	ENE	NE	WNW	0	0	0	1	2	4	2	2	2	2	2	2
26/06/2018	3	06:35	09:35	1	1	2	SE	SE	SE	0	0	0	7	6	6	2	2	2	2	2	2
26/06/2018	3	10:05	13:05	2	2	2	SE	SE	SE	0	0	0	7	7	7	2	2	2	2	2	2
26/06/2018	1b	13:15	16:15	2	2	2	SE	SE	SE	0	0	0	7	5	7	2	2	2	2	2	2
26/06/2018	1b	16:45	19:45	2	2	2	SE	SE	SE	0	0	0	7	5	5	2	2	2	2	2	2

Date	VP	Start Time	End Time	Wind Speed			Wind Direction			Rainfall			Cloud Cover			Cloud Height			Visibility		
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
25/07/2018	3	06:05	09:05	2	2	2	SE	SE	SE	0	0	0	6	4	4	2	2	2	2	2	2
25/07/2018	3	09:35	12:35	2	3	3	SE	SE	SE	0	0	0	3	2	2	2	2	2	2	2	2
25/07/2018	1b	12:15	15:15	4	3	3	S	S	SSE	0	0	0	5	3	3	2	2	2	2	2	2
25/07/2018	1b	15:45	18:45	3	3	3	SSE	SSE	SSE	0	0	0	3	1	1	2	2	2	2	2	2
24/08/2018	2b	06:05	09:05	2	3	3	W	W	W	2	2	2	8	7	7	2	2	2	2	2	2
24/08/2018	3	06:40	09:40	2	3	3	W	W	W	0	2	0	3	4	3	1	1	2	2	2	2
24/08/2018	2b	09:35	11:05	3	3		W	W		2	2		7	7		2	2		2	2	
24/08/2018	3	10:10	13:10	3	3	3	W	W	W	0	0	0	5	5	5	2	2	2	2	2	2
24/08/2018	1b	11:55	14:55	4	4	4	W	W	W	2	0	2	7	5	7	2	2	2	2	2	2
24/08/2018	2b	14:05	17:05	3	3	3	W	W	W	2	2	2	6	4	5	2	2	2	2	2	2
24/08/2018	1b	15:25	16:55	4	4		W	W		2	0	0	7	7		2	2		2	2	
25/08/2018	3	06:50	09:50	3	3	3	W	W	W	0	0	0	2	1	2	2	2	2	2	2	2
25/08/2018	1b	09:45	12:45	3	4	3	W	SW	W	0	0	0	7	5	5	2	2	2	2	2	2
25/08/2018	2b	10:35	12:05	3	3		W	W		0	0		3	3		2	2	0	2	2	0
25/08/2018	1b	13:15	14:45	3	3		W	W		0	0		5	5		2	2		2	2	
18/09/2018	2b	06:20	09:20	3	3	4	W	W	W	2	0	2	8	8	8	2	2	1	2	2	1
18/09/2018	3	08:20	11:20	3	3	3	SE	SE	S	0	2	2	8	8	8	1	1	1	2	2	1
18/09/2018	3	11:50	14:50	3	4	4	S	S	SW	2	2	0	8	8	8	1	1	1	1	1	1
18/09/2018	1b	13:30	16:30	4	4	4	SSW	SSW	SSW	0	0	0	7	5	7	2	2	2	2	2	2
18/09/2018	2b	15:50	18:50	3	3	3	SW	SW	SW	0	0	0	4	5	3	2	2	2	2	2	2
18/09/2018	1b	17:00	20:00	4	5	5	SSW	SSW	SSW	2	0	0	7	7	7	2	2	2	2	2	2
19/09/2018	1b	06:25	09:25	5	6	6	SSW	SSW	S	3	3	3	8	8	8	2	2	2	2	2	2

Date	VP	Start Time	End Time	Wind Speed			Wind Direction			Rainfall			Cloud Cover			Cloud Height			Visibility		
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
19/09/2018	2b	08:05	09:35	5	5		S	S		3	3		8	8		2	2		2	2	
19/09/2018	3	10:10	13:10	5	6	6	S	S	S	2	2	2	8	8	8	1	1	1	2	2	3
19/09/2018	2b	11:50	13:20	6	6		S	S		0	2		8	8		2	2		2	2	
23/10/2018	2b	07:15	10:15	5	4	4	W	W	W	2	2	2	8	8	8	1	1	1	1	1	1
23/10/2018	3	08:15	11:15	4	4	4	W	W	W	1	2	2	8	8	8	1	1	1	1	1	1
23/10/2018	3	11:45	14:45	4	4	4	W	W	W	1	2	2	8	8	8	1	1	1	1	1	1
23/10/2018	1b	12:20	15:50	4	4	4	W	W	W	2	2	2	8	8	8	1	1	1	1	1	1
23/10/2018	2b	15:05	18:05	5	5	5	NW	NW	NW	2	1	0	8	8	8	1	1	1	1	1	1
23/10/2018	1b	15:50	18:50	4	4	4	W	W	W	2	2	2	8	8	8	1	1	1	1	1	1
24/10/2018	1b	07:25	10:25	4	3	3	W	W	W	2	2	2	8	8	8	1	1	1	1	1	1
24/10/2018	2b	08:00	09:30	3	4		NW	N		0	1		8	8		1	1		1	1	
24/10/2018	3	10:05	13:05	4	3	3	W	W	W	1	0	0	8	8	8	1	1	1	2	2	2
24/10/2018	2b	11:10	12:40	4	3		W	W		2	0	0	8	8		1	1		1	1	
20/11/2018	2b	07:00	10:00	5	4	4	ENE	ENE	ENE	0	0	0	5	7	8	2	2	2	1	2	2
20/11/2018	3	07:00	10:00	5	4	4	ENE	ENE	ENE	0	0	0	5	7	8	2	2	2	2	2	2
20/11/2018	3	10:30	13:30	4	4	4	E	E	E	2	2	2	5	4	4	2	2	2	2	2	2
20/11/2018	1b	10:40	13:40	4	5	5	ENE	ENE	ENE	0	2	2	7	7	7	2	2	2	2	2	2
20/11/2018	2b	14:00	17:00	5	5	5	ENE	ENE	ENE	3	0	2	4	6	7	2	2	2	2	2	2
20/11/2018	1b	14:10	17:10	5	4	4	ENE	ENE	ENE	2	0	2	7	7	7	2	2	2	2	2	2
21/11/2018	1b	07:15	10:15	4	3	3	E	E	E	2	0	0	8	7	7	2	2	2	1	2	2
21/11/2018	2b	07:50	09:35	4	4		E	E		0	0		6	4		2	2		2	2	
21/11/2018	3	10:05	13:05	4	4	4	E	E	E	0	0	2	7	7	7	2	2	2	2	2	2

Date	VP	Start Time	End Time	Wind Speed			Wind Direction			Rainfall			Cloud Cover			Cloud Height			Visibility		
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
21/11/2018	2b	11:05	15:50	4	4		E	E		0	0		7	7		2	2		2	2	
11/12/2018	2b	07:40	10:40	4	4	5	SE	SE	SE	2	2	2	8	8	8	1	1	1	1	1	1
11/12/2018	3	08:05	11:05	4	4	5	SE	SE	SE	2	2	2	8	8	8	1	1	1	1	1	1
11/12/2018	1b	11:20	14:20	5	5	5	SE	SE	SE	2	2	2	8	8	8	1	1	1	1	1	1
11/12/2018	3	11:35	14:35	5	5	6	SE	SE	SE	1	1	1	8	8	8	1	1	1	1	1	1
11/12/2018	1b	14:50	16:50	5	5		SE	SE		2	2		8	8		1	1		1	1	
11/12/2018	2b	15:05	17:05	5	6		SE	SE		1	1		8	8		0	0		0	0	
12/12/2018	1b	08:00	11:30	5	5		SE	SE		2	2		8	8		1	1		1	1	
12/12/2018	2b	08:05	11:05	4	4		SE	SE		0	1		8	8		1	0		1	1	
12/12/2018	1b	11:00	12:30	5	5		SE	SE		2	2		8	8		1	1		1	1	
12/12/2018	3	11:10	14:10	5	5	5	SE	SE	SE	1	1	1	8	8	8	1	1	1	1	1	0
12/12/2018	2b	13:15	14:45	5	6		SE	SE		2	2		8	8		1	1		1	1	
22/01/2019	2b	07:35	10:35	2	3	3	NW	NW	NW	2	2	0	8	7	8	2	2	2	2	2	2
22/01/2019	3	07:50	10:50	2	2	1	W	W	W	3	2	0	8	8	5	2	2	2	2	2	2
22/01/2019	1b	11:15	14:15	2	2	3	NW	W	W	2	2	2	7	7	8	2	2	2	2	2	2
22/01/2019	3	11:20	14:20	1	1	2	W	W	W	2	2	0	4	6	3	2	2	2	2	2	2
22/01/2019	1b	14:45	17:30	2	2	2	W	W	W	2	0	0	7	7	7	2	2	2	2	2	2
22/01/2019	2b	14:45	17:30	2	2	2	W	W	W	0	0	2	6	5	8	2	2	2	2	2	2
23/01/2019	1b	07:50	10:50	2	2	2	W	W	W	0	0	0	5	5	7	2	2	2	2	2	2
23/01/2019	2b	08:30	11:30	1	1	0	W	W		0	0	0	5	6	4	2	2	2	2	2	2
23/01/2019	2b	12:00	14:00	1	2		W	W		0	0		5	6		2	2		2	2	
23/01/2019	3	12:05	15:05	3	3	3	W	W	W	0	0	0	5	5	7	2	2	2	2	2	2

Date	VP	Start Time	End Time	Wind Speed			Wind Direction			Rainfall			Cloud Cover			Cloud Height			Visibility		
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
05/02/2019	2b	07:10	10:10	5	5	5	SE	SE	SE	0	2	0	7	7	8	2	2	2	2	2	2
05/02/2019	3	07:50	10:50	4	5	5	SW	SW	SW	0	0	0	8	8	8	2	2	2	2	2	2
05/02/2019	1b	11:00	14:00	5	5	5	SE	SE	SE	0	2	3	7	8	8	2	2	1	2	2	2
05/02/2019	3	11:10	14:10	6	5	5	SW	S	S	0	0	0	6	7	7	2	2	2	2	2	2
05/02/2019	2b	14:30	17:30	6	7	6	S	SSE	SE	3	2	2	8	8	8	1	1	1	2	2	1
05/02/2019	1b	14:30	17:30	5	4	4	SE	SE	SE	2	2	2	8	8	8	2	1	1	1	1	1
06/02/2019	1b	07:20	10:20	3	4	4	S	S	S	0	0	0	7	7	7	2	2	2	1	2	2
06/02/2019	2b	08:00	09:30	3	2		SW	SW		0	0	0	6	4		2	2		2	2	
06/02/2019	3	10:05	13:05	3	3	3	SW	SW	SW	0	0	0	7	7	4	2	2	2	2	2	2
06/02/2019	2b	11:05	12:35	3	3		S	S		0	0		7	7		2	2		2	2	
06/03/2019	2b	08:25	11:25	6	5	5	E	E	NE	3	2	2	8	8	8	1	1	1	1	2	2
06/03/2019	3	08:30	11:30	5	5	5	E	E	SE	2	2	2	8	8	8	1	1	1	2	2	2
06/03/2019	3	12:00	15:00	4	4	4	SE	S	SSW	2	2	2	8	8	8	1	1	1	1	2	2
06/03/2019	1b	12:10	15:10	4	3	3	NE	NE	E	2	2	2	8	8	7	1	2	2	1	2	2
06/03/2019	2b	15:30	18:30	2	3	2	S	SE	SE	2	0	0	8	7	7	1	1	1	1	2	2
06/03/2019	1b	15:40	18:40	3	3	3	SE	SE	SE	0	0	0	7	7	7	2	2	2	2	2	2
07/03/2019	2b	08:00	09:30	3	3		NNW	NNW		2	0		8	8		2	2		2	2	
07/03/2019	1b	08:25	11:25	4	3	3	NW	NW	NW	2	0	0	8	7	7	2	2	2	2	2	2
07/03/2019	3	10:20	13:20	4	4	4	NNW	NNW	NNW	0	0	0	7	7	6	2	2	2	2	2	2
07/03/2019	1b	12:10	13:40	3	3		NW	NW		0	0		7	7		2	2		2	2	

Date	VP	Start Time	End Time	Wind Speed			Wind Direction			Rainfall			Cloud Cover			Cloud Height			Visibility		
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
11/03/2020	2b	12:40	15:40	4	4	4	W	W	W	2	0	2	8	8	8	2	2	2	2	2	2
11/03/2020	2b	16:10	19:10	5	5	4	SW	SW	SW	2	2	0	8	8	8	2	2	2	2	2	2
12/03/2020	3	08:35	11:35	6	6	6	SW	SW	SW	2	2	2	8	8	8	2	2	2	2	2	2
12/03/2020	3	12:05	15:05	7	7	7	SW	SW	SW	2	2	2	8	8	8	2	2	2	2	2	2
13/03/2020	1b	08:30	11:30	4	4	5	E	E	E	0	0	0	1	1	1	2	2	2	2	2	2
13/03/2020	1b	12:00	15:00	4	5	4	E	E	E	0	0	0	1	3	3	2	2	2	2	2	2
27/04/2020	1b	12:05	15:05	3	3	3	NW	NW	NW	0	0	0	3	3	3	2	2	2	2	2	2
27/04/2020	1b	15:35	18:35	3	3	3	NW	NW	NW	0	0	0	3	1	1	2	2	2	2	2	2
28/04/2020	2b	05:50	08:50	3	3	3	E	E	SE	0	0	0	3	3	5	2	2	2	2	2	2
28/04/2020	2b	09:30	12:30	3	3	3	SE	SE	SE	0	0	0	5	5	7	2	2	2	2	2	2
29/04/2020	3	05:45	08:45	4	4	4	E	E	E	0	0	0	7	7	7	2	2	2	2	2	2
29/04/2020	3	09:15	12:15	4	3	3	E	E	E	0	0	2	7	7	7	2	2	2	2	2	2
29/05/2020	2b	14:00	17:00	4	4	4	SE	SE	SE	0	0	0	1	3	5	2	2	2	2	2	2
29/05/2020	2b	17:30	20:30	4	4	4	SE	SE	SE	0	0	0	3	3	3	2	2	2	2	2	2
30/05/2020	1b	06:05	09:05	4	4	3	SE	SE	SE	0	0	0	1	1	3	2	2	2	2	2	2
30/05/2020	1b	09:35	12:35	3	3	3	SE	SE	SE	0	0	0	3	3	3	2	2	2	2	2	2
31/05/2020	3	05:55	08:55	3	3	2	SE	SE	SE	0	0	0	1	1	1	2	2	2	2	2	2
31/05/2020	3	09:25	12:25	2	2	2	SE	SE	SE	0	0	0	1	1	1	2	2	2	2	2	2
11/06/2020	2b	14:40	17:40	4	3	3	NE	E	E	0	0	0	5	5	5	2	2	2	2	2	2
11/06/2020	2b	18:10	21:10	4	4	3	NE	NE	NE	0	0	0	5	5	7	2	2	2	2	2	2
12/06/2020	1b	05:45	08:45	5	5	4	NE	NE	E	0	0	0	7	7	7	2	2	2	2	2	2
12/06/2020	1b	09:15	12:15	4	4	4	E	E	E	0	0	0	7	7	7	2	2	2	2	2	2

Date	VP	Start Time	End Time	Wind Speed			Wind Direction			Rainfall			Cloud Cover			Cloud Height			Visibility		
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
13/06/2020	3	05:10	08:10	4	4	4	NE	NE	NE	0	0	2	7	7	7	2	2	2	2	2	2
13/06/2020	3	08:40	11:40	3	3	3	NE	NE	NE	2	2	2	7	7	7	2	2	2	2	2	2
09/07/2020	2b	05:15	08:15	3	3	3	W	W	W	0	0	0	5	5	5	2	2	2	2	2	2
09/07/2020	2b	08:45	11:45	3	3	3	W	W	W	0	0	0	7	7	7	2	2	2	2	2	2
10/07/2020	1b	14:10	17:10	3	3	3	NW	NW	NW	0	0	2	7	5	7	2	2	2	2	2	2
10/07/2020	1b	17:40	20:40	3	3	3	W	W	W	0	0	0	7	7	7	2	2	2	2	2	2
11/07/2020	3	06:05	09:05	3	3	3	W	W	NW	0	0	2	7	7	8	2	2	2	2	2	2
11/07/2020	3	09:35	12:35	3	3	3	NW	W	W	2	2	2	8	8	7	2	2	2	2	2	2
04/08/2020	3	14:50	17:50	4	4	4	W	W	W	3	3	3	8	8	8	2	2	2	2	2	2
04/08/2020	3	18:20	21:20	3	3	3	W	W	W	2	2	2	8	8	8	2	2	2	2	2	2
05/08/2020	1b	05:50	08:50	3	3	3	NW	W	W	0	0	0	7	7	8	2	2	2	2	2	2
05/08/2020	1b	09:20	12:20	3	2	2	S	S	W	0	0	2	7	7	7	2	2	2	2	2	2
06/08/2020	2b	05:35	08:35	2	3	3	W	W	W	0	0	0	7	5	5	2	2	2	2	2	2
06/08/2020	2b	09:05	12:05	3	3	3	SW	SW	SW	0	0	0	7	7	5	2	2	2	2	2	2

Each row is a separate survey. Summaries are given for each survey hour. Wind speed is on a twelve-point scale from 0 (calm) to 6 (strong breeze) and 12 (hurricane). Rainfall has four classes: 0 – none; 1 – drizzle; 2 - light shower; 3 - heavy shower; 4 - heavy rain. Cloud cover is on an eight-point scale from 0 (none) to 8 (no open sky). Cloud height is 0 <150 m; 1 150-500 m; and, 2 >500 m. Visibility is 0 (poor, <1 km); 1 (moderate, 1 - 2 km); and, 2 (good, >2 km).

Viewsheds

A.2.5 Viewsheds from the VP locations were calculated using the parameters described in Table A-2. All viewsheds used a 25m vertical offset from the ground surface and a 2km horizontal detection threshold. Azimuths 1 and 2 specify horizontal limits of the viewshed. The viewsheds associated with each VP and in relation to the turbine layout are shown in Figure 5.

Table A-2 Vantage Point Locations and Parameters Used to Calculate Viewsheds

VP	Dates Used	X	Y	Azimuth 1 (°)	Azimuth 2 (°)
1a	November 2014 to April 2015	173185	641772	205	25
1b	April 2015 to August 2020	173094	641422	205	25
2a	November 2014 to April 2016	170853	639583	280	100
2b	August 2018 to August 2020	173288	643718	80	260
3	November 2014 to August 2020	170986	643348	35	215

Survey Method

A.2.6 VP surveys followed the methods described in SNH (2017). The surveys were carried out during daylight hours, including around sunrise and sunset, at which times certain species may be more active, including Greenland white-fronted geese *Anser albifrons flavirostris*. Each survey lasted for a maximum of three hours, with a minimum of thirty minutes break between each three-hour survey.

A.2.7 Target species recorded during the VP surveys were:

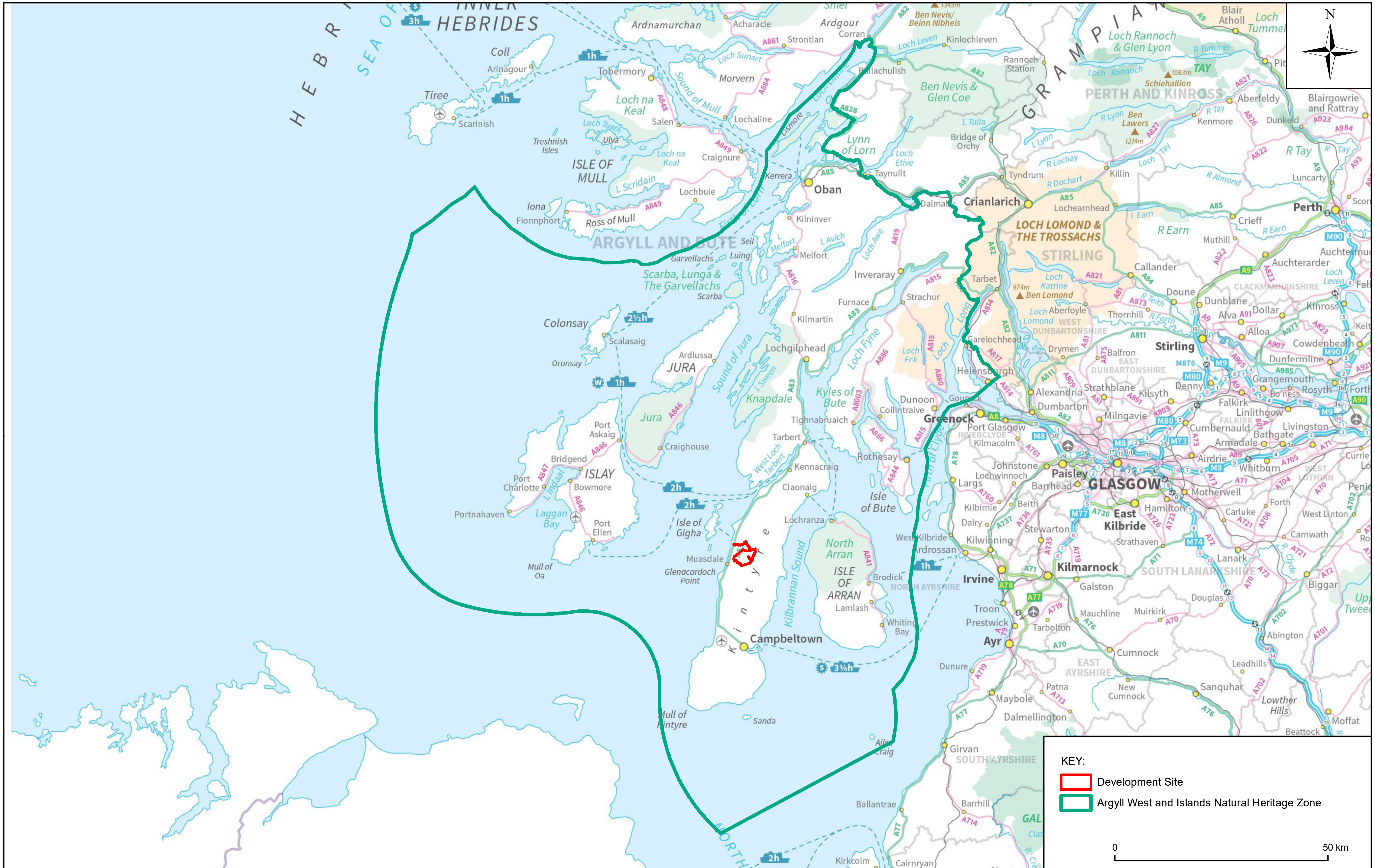
- All raptor species listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended),
- All diver species,
- All wader species,
- All geese, swans and ducks, and
- Black grouse *Tetrao tetrix*.

A.2.8 Kestrels *Falco tinnunculus*, buzzards *Buteo buteo*, ravens *Corvus corax*, red grouse *Lagopus lagopus*, grey heron *Ardea cinerea* and gulls were also recorded as secondary species.

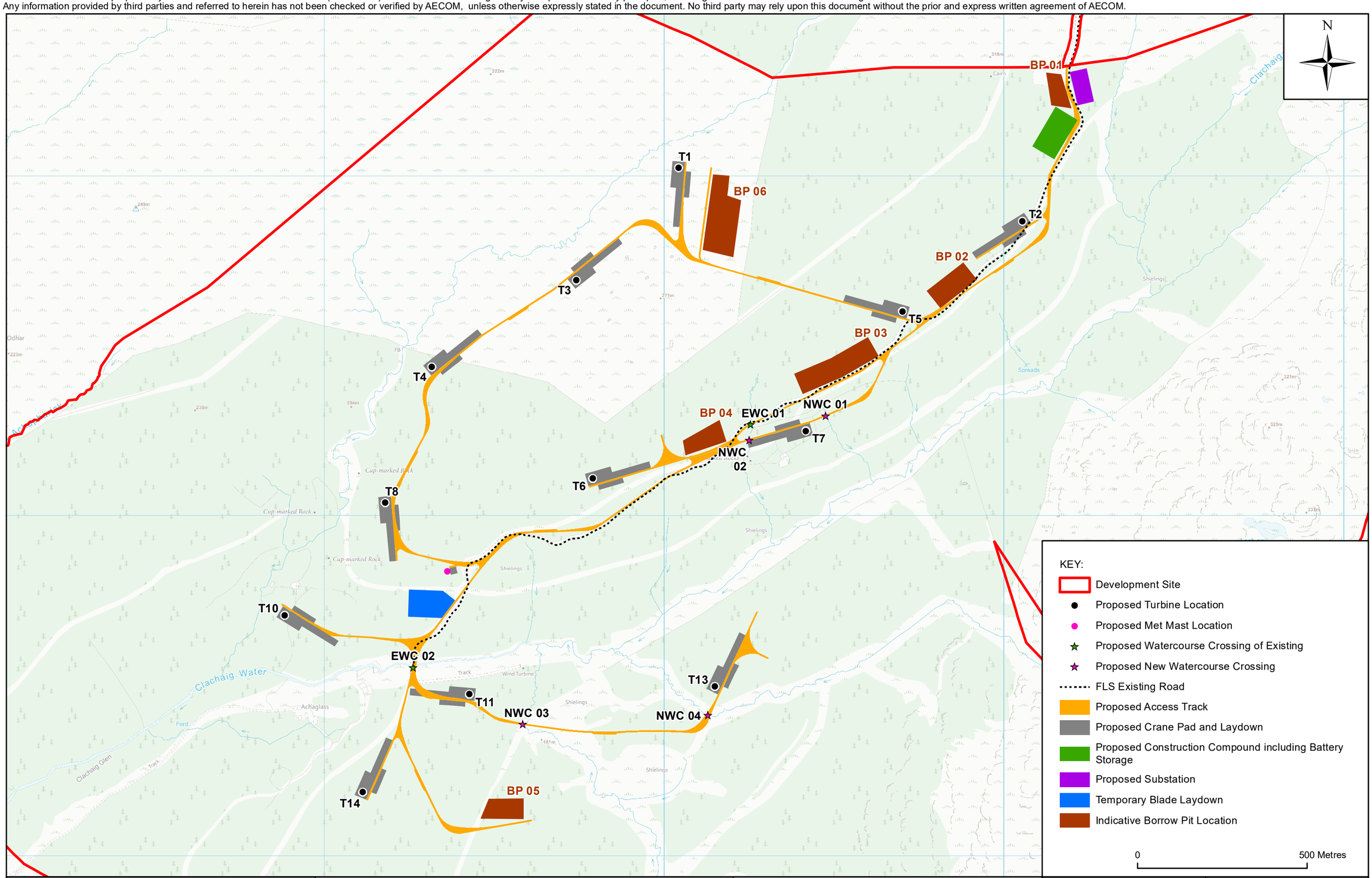
Clachaig Glen Wind Farm

Habitats Regulations Appraisal

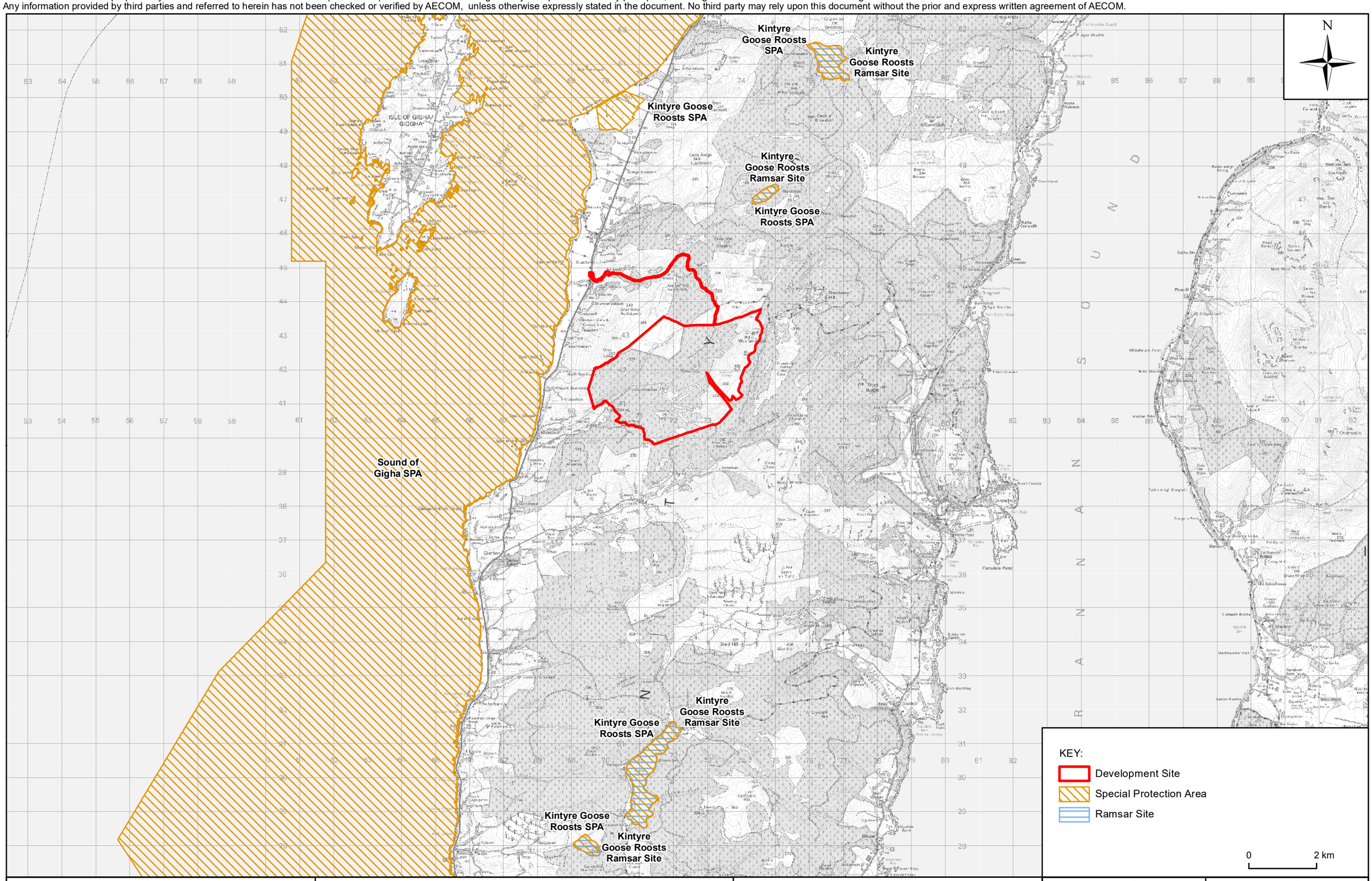
Figures: 1; 2; 3; 4; 5



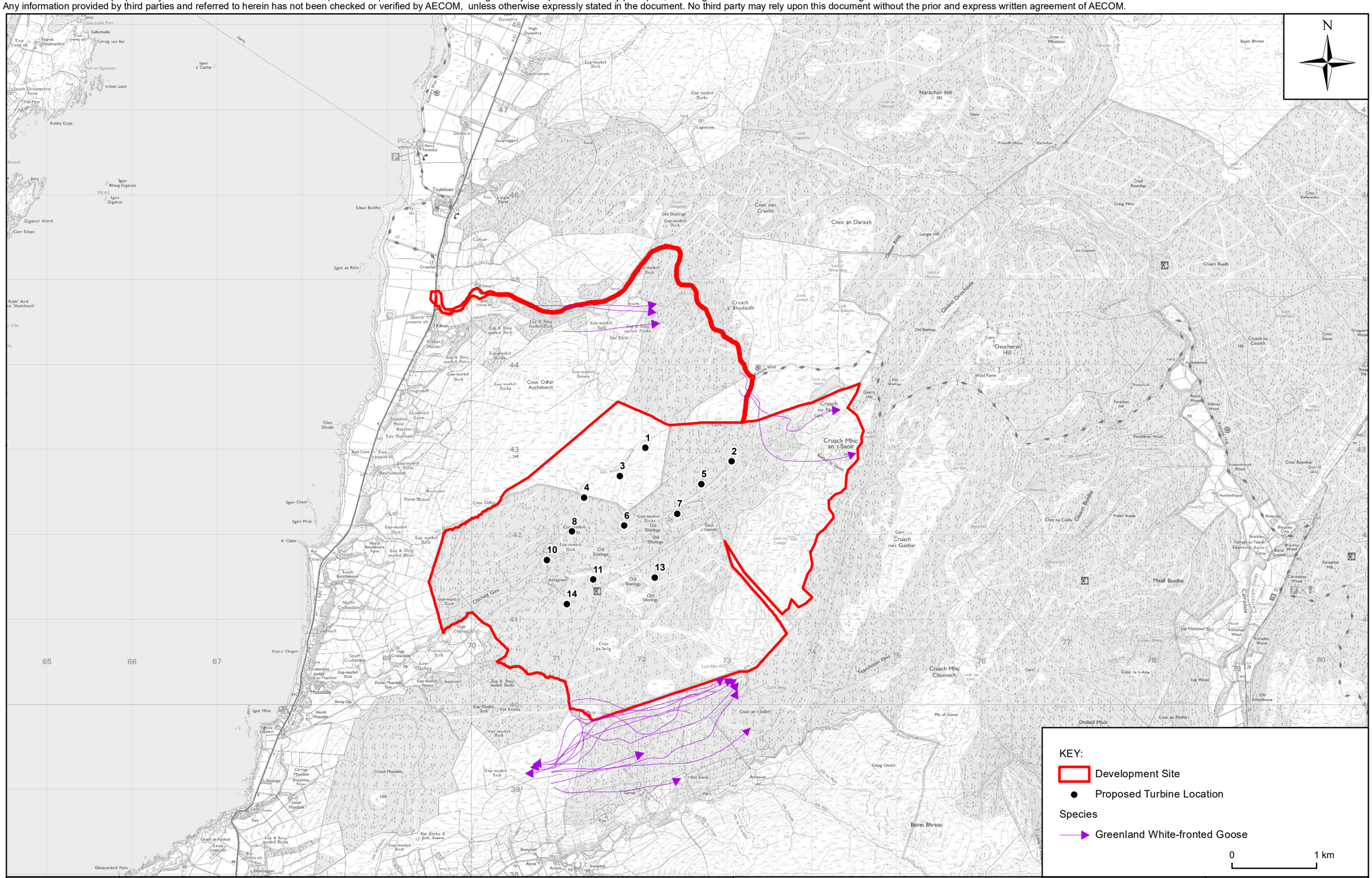
Client: RWE	Title: FIGURE 1 SITE LOCATION PLAN	AECOM One Trinity Gardens Quayside Newcastle, NE1 2HF Tel +44 (0) 191 224 6500 Fax +44 (0) 191 224 6599 www.aecom.com	Drawn: LC; Checked: AR
Project: CLACHAIG GLEN WIND FARM ENVIRONMENTAL IMPACT ASSESSMENT			Verified: TM; Approved: FB
			Date: FEBRUARY 2022; Scale at A3: 1:800,000
			Drawing Number: CG_220221_HRAS1_v2; A3



Client: RWE	Title: FIGURE 2 LAYOUT OF THE PROPOSED DEVELOPMENT	AECOM One Trinity Gardens Quayside Newcastle, NE1 2HF Tel +44 (0) 191 224 6500 Fax +44 (0) 191 224 6599 www.aecom.com	Drawn: LC / Checked: AR / Verified: TM / Approved: SW / Date: FEBRUARY 2022 / Scale at A3: 1:10,000 / Drawing Number: CG_220221_HRAS2_v2 / A3
Project: CLACHAIG GLEN WIND FARM ENVIRONMENTAL IMPACT ASSESSMENT			

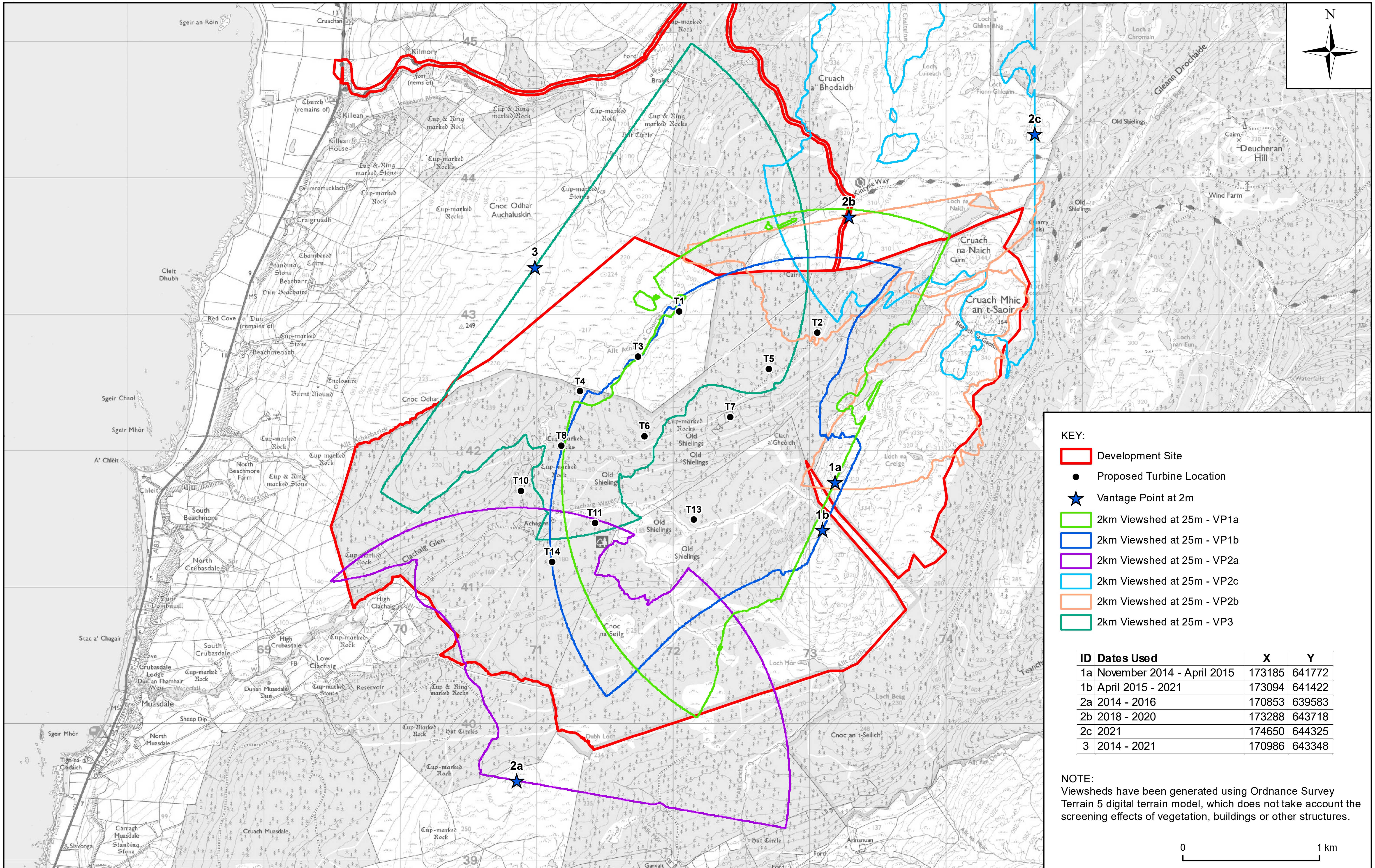


Client: RWE	Title: FIGURE 3 EUROPEAN SITES WITHIN 10KM OF THE DEVELOPMENT SITE	AECOM One Trinity Gardens Quayside Newcastle, NE1 2HF Tel +44 (0) 191 224 6500 Fax +44 (0) 191 224 6599 www.aecom.com	Drawn: LC / Checked: AR
Project: CLACHAIG GLEN WIND FARM ENVIRONMENTAL IMPACT ASSESSMENT			Verified: TM / Approved: SW
			Date: FEBRUARY 2022 / Scale at A3: 1:100,000
			Drawing Number: CG_220221_HRAS3_v3 / A3



Client: RWE	Title: FIGURE 4 GREENLAND WHITE-FRONTED GOOSE FLIGHTS	AECOM One Trinity Gardens Quayside Newcastle, NE1 2HF	Tel +44 (0) 191 224 6500 Fax +44 (0) 191 224 6599 www.aecom.com
Project: CLACHAIG GLEN WIND FARM ENVIRONMENTAL IMPACT ASSESSMENT			

Drawn:	LC	Checked:	AR
Verified:	TM	Approved:	SW
Date:	FEBRUARY 2022	Scale at A3:	1:40,000
Drawing Number:	CG_220221_HRAS4_v3		A3



KEY:
- Development Site
- Proposed Turbine Location
- Vantage Point at 2m
- 2km Viewshed at 25m - VP1a
- 2km Viewshed at 25m - VP1b
- 2km Viewshed at 25m - VP2a
- 2km Viewshed at 25m - VP2c
- 2km Viewshed at 25m - VP2b
- 2km Viewshed at 25m - VP3

ID	Dates Used	X	Y
1a	November 2014 - April 2015	173185	641772
1b	April 2015 - 2021	173094	641422
2a	2014 - 2016	170853	639583
2b	2018 - 2020	173288	643718
2c	2021	174650	644325
3	2014 - 2021	170986	643348

NOTE:
Viewsheds have been generated using Ordnance Survey Terrain 5 digital terrain model, which does not take account the screening effects of vegetation, buildings or other structures.

Client: RWE	Title: FIGURE 5 VANTAGE POINT LOCATIONS AND VIEWSHEDS	AECOM	Drawn: LC / Checked: AR
Project: CLACHAIG GLEN WIND FARM ENVIRONMENTAL IMPACT ASSESSMENT		One Trinity Gardens, Quayside, Newcastle, NE1 2HF — Tel +44 (0) 191 224 6500, Fax +44 (0) 191 224 6599, www.aecom.com	Verified: TM / Approved: SW
			Date: FEBRUARY 2022 / Scale at A3: 1:25,000
			Drawing Number: CG_220221_HRAS5_v1 / A3

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