

DESIGN AND ACCESS STATEMENT

Kirkton Energy Park
Prepared for: Kirkton Wind Farm Limited

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CONTENTS

1.0	INTRODUCTION	1
2.0	SITE LOCATION	2
2.1	Site Description	2
2.2	Surrounding Area	3
3.0	DESIGN POLICIES	4
3.1	National Guidance	4
3.2	Development Plan.....	4
3.2.1	Highland-wide Local Development Plan (2012).....	5
3.2.2	Onshore Wind Energy Supplementary Guidance (2017)	6
3.2.3	Caithness and Sutherland Local Development Plan CaSPlan (2018)	6
4.0	DESIGN PRINCIPLES	8
5.0	DESIGN EVOLUTION.....	10
5.1	Wind Turbine Layouts	12
5.1.1	Layout A (Initial Maximum Layout).....	13
5.1.2	Layout B (Pre Application Advice Layout)	13
5.1.3	Layout C (Scoping Layout)	13
5.1.4	Layout D (Scoping Addendum Layout)	14
5.1.5	Layout E (Design Freeze – The Proposed Development)	14
5.2	Other Site Infrastructure.....	15
5.2.1	Site Access.....	15
5.2.2	Site Tracks	15
5.2.3	Borrow Pits.....	15
5.2.4	Temporary Construction Compound.....	16
5.2.5	Substation Compound.....	16
5.3	The Proposed Development Considered Against Design Objectives	17
6.0	PROPOSED DEVELOPMENT	20
7.0	PUBLIC ACCESS	21
7.1.1	Public Access – Pedestrian	21
7.1.2	Public Access – Vehicular	21
8.0	CONCLUSION	22
9.0	REFERENCES	23

DOCUMENT REFERENCES

FIGURES

- Figure 1: Site location
- Figure 2: Aerial Photograph
- Figure 3: Application Boundary
- Figure 4: Abnormal Turning Area A
- Figure 5: Abnormal Turning Area B
- Figure 6: Environmental Designations
- Figure 7: Design Evolution
- Figure 8a – 11b: Wireline Comparisons
- Figure 12: Proposed Melvich Turning Area
- Figure 13: Bare Earth ZTV – Proposed Borrow Pits
- Figure 14: Bare Earth ZTV - Substation
- Figure 15 – 24: VP Photomontages
- Figure 25: Site Layout

1.0 Introduction

1. Kirkton Wind Farm Limited (the applicant) proposes to install and operate an energy park comprising up to 11 wind turbines with associated infrastructure (the proposed development) on land approximately 2.1km south of the settlement of Melvich, Sutherland. The location of the main site area (hereafter referred to as the 'site') is centred on NGR NC 87999, 59788 and covers an area of approximately 416.71ha. There are two abnormal load turning areas included in the proposed development, which are located along the A836, separate to the site. These turning areas are 1.09ha (Western Turning Area) and 1.61ha (Eastern Turning Area) in size respectively. Only one turning area would be required should consent for the proposed development be granted. The proposed development includes a substation compound which encompasses a control building and 20MW of battery storage. The proposed development would be known as Kirkton Energy Park.
2. An application for consent for the proposed development is being submitted to the Scottish Government Energy and Consents Unit (ECU) under Section 36 of the Electricity Act 1989 (the 1989 Act), to include a request for deemed planning permission to be granted for the development under Section 57(2) of the Town and Country Planning (Scotland) Act 1997. The relevant planning authority will be The Highland Council (THC).
3. This Design and Access Statement (DAS) is submitted in support of the application for consent which has been submitted by Kirkton Wind Farm Limited for the proposed development. The DAS does not form part of the Environmental Impact Assessment (EIA Report). However, the DAS should be read in the context of the EIA Report.

2.0 Site Location

4. In order to understand the design of the proposed development it is important to relate this to the site and its context. A site location plan is contained as **Figure 1** of this document. An aerial photograph of the site and its surroundings is contained as **Figure 2**. A plan (OS mapping not aerial photography) showing the application boundary in more detail is contained as **Figure 3**.

2.1 Site Description

5. A detailed design description is included within the EIA Report (Chapter 2 and Chapter 3). The following paragraphs provide a general description of the site.
6. The site is located on the western edge of Strath Halladale, Sutherland, at the north of mainland Scotland. The site is centred on NGR NC 87999, 59788, and is approximately 416.71ha in size, comprised mainly of sweeping moorland and flows. The site is currently used predominantly for animal grazing, with some small areas of commercial forestry. The location of the site and application boundary are shown in **Figure 1** and **Figure 3**.
7. Access to the site would be from the A836, taking the Kirkton Farm road (near Loch Mor) southward to Kirkton Farm and then continuing south to where the turbines would be located. For abnormal loads coming from the east (port of Scrabster) to access the Kirkton Farm road, it will be necessary for the vehicles to continue on the A836 past the Kirkton Farm road entrance, turn, and approach from the north / west. Therefore, two small turning areas (outwith the site) along the A836 are included as part of the proposed development, in order to facilitate access of abnormal loads to the site (see **Figure 4** and **Figure 5**). These two abnormal loads turning area options are located at NGR NC 85250, 65287 (Turning Area A (Western Turning Area)) and NGR NC 87786, 64983 (Turning Area B (Eastern Turning Area)). Only one turning area would need to be constructed should consent for the proposed development be granted.
8. The site encompasses two areas of conifer forestry, the largest of which is at the north of the site. In addition to this there are eight blocks of native deciduous woodland which have recently been planted at various locations across the site. Felling in order to facilitate proposed infrastructure and also to allow for habitat improvements form part of the proposed development and are detailed further in Section 6 of this document and also within **Chapter 3: Description of Development** of the EIA Report.
9. The following statutory designated sites lie just within the north western extent of the site boundary (**Figure 6**). No infrastructure is proposed within the statutory designations. Where there is overlap between the proposed development site boundary and a statutory designated area, this is solely to allow the felling of conifer woodland and facilitate habitat improvements:
 - West Halladale Site of Special Scientific Interest (SSSI);
 - Caithness and Sutherland Peatlands Ramsar;
 - Caithness and Sutherland Peatlands Special Area of Conservation (SAC); and
 - Caithness and Sutherland Peatlands Special Protection Area (SPA).
10. There are four main watercourses within the study area. From south to north are: the Allt an Tigh-Choinneimh, Allt nan Gall, Allt na h-Eaglaise, and an un-named watercourse at Kirkton farm. All of these watercourses are tributaries of the River Halladale which lies to the east of the site.

11. Topography on site ranges from approximately 20m AOD to 160m AOD with the western extent of the proposed site forming the most elevated section.
12. The dominant wind direction at the site is from a west south west (WSW) direction. Average wind speed at hub height (approximately 83m above ground level) is upwards of 8 metres per second.

2.2 Surrounding Area

13. The surrounding area is rural in nature, with land predominantly used for agriculture (predominantly grazing) and forestry. There are several settlements located in the vicinity of the proposed site, including Melvich approximately 2.1km to the north, Armadale approximately 8.6km to the north west and Reay approximately 7.9km to the north east. Strath Halladale contains several residential properties located along the A897 between the junction with the A836 and Forsinain.
14. In addition to the designated sites listed in paragraph 9 (which are partially inside, but mainly outwith, the site), the following are the closest environmental designations that lie outside the site boundary (see **Figure 6**):
 - East Halladale Flows Wild Land 1.29km to the east;
 - East Halladale SSSI 1.50km to the east;
 - Red Point Coast SSSI 4.55km to the north east;
 - North Caithness Cliffs 4.4km to the north east;
 - Farr Bay, Strathy and Portskerra Special Landscape Area (SLA) 3.16km to the north west; and
 - Strathy Coast SSSI 2.69km to the north and north west.
15. Approximately 4.47km to the west of the site is the operational Strathy North Wind Farm, which comprises 33 wind turbines (110m tip height).
16. There is a sand and natural aggregate quarry located approximately 1.3km north of the site entrance, and a wood processing and biofuel plant located approximately 800m to the south east of the site
17. The proposed development sits on the western edge of Strath Halladale, with the Strath running north to south in orientation. The nearest residential properties to the proposed development are identified as follows (distance to nearest wind turbine not site boundary):
 - Ar Dachaidh – Approximately 1.22km north east from Turbine no.1; and
 - 27 Upper Bighouse – Approximately 1.47km south east from Turbine no.11.

3.0 Design Policies

18. The preparation of this DAS has had regards to Planning Advice Note 68: Design Statements, the Highland-wide Local Development Plan 2012 (HwLDP), Caithness and Sutherland Local Development Plan 2018 (CaSPlan) and The Highland Council's 'Onshore Wind Energy Supplementary Guidance' (amended 2017) (OWESG).
19. The design of the proposed development was carefully considered in the context of national advice in respect of design, the Development Plan and supplementary guidance which is relevant to the proposed development.
20. In accordance with Scottish Planning Policy (SPP), the HwLDP, CaSPlan and OWESG provide a spatial framework for wind energy development of over 50m to tip height, identifying areas that are likely to be more appropriate for onshore wind development in order to provide guidance to developers and communities. The spatial framework presented in these documents is discussed further in section 3.1.

3.1 National Guidance

21. The most important national policy documents relating to the siting and design of the proposed development are The National Planning Framework 3 (NPF3), and SPP along with the associated Planning Advice Notes (PANS), and also the Onshore Wind Turbines: Planning Advice. Further to this, the Draft NPF4 should be considered with regards to the siting and development of the proposed development. See Chapter 4 of the EIA Report.
22. In relation to the design and layout of wind farms, Table 1 in the SPP sets out the basis for a spatial framework in which hierarchy of protection is defined. Group 1 are areas such as National Parks and National Scenic Areas and are defined as "*Areas where wind farms will not be acceptable*". Group 2 areas are based on a range of national designations, other nationally important environmental interests (such as wild land or carbon rich soils, deep peat and priority peatland habitat), and community separation distances (2km from cities, towns and villages identified in the Local Development Plan). Group 2 areas are defined as "*Areas of Significant Protection*". Group 3 areas are defined as "*Areas with potential for wind farm development*" depending on detailed consideration against the specified policy criteria.
23. Having assessed the site against these criteria and the Spatial Framework detailed in the HwLDP and OWESG, it is considered that the land occupied by the proposed development is mainly an SPP Group 2 area, which is an "*area of significant protection*". Group 2 areas are categorized as "*areas where wind farms may be appropriate*" but also requiring the applicant to "*demonstrate that any significant effects on the qualities of these areas can be substantially overcome by siting, design or other mitigation*". The majority of the areas of the site that have been classified as Group 2 have been so due to the high level mapping of Carbon Rich Soils, deep peat and priority peatland habitat. Group 2 area classification does not exclude wind farm development and the issue of Carbon Rich Soils can be adequately addressed through site design, mitigation and compensation.

3.2 Development Plan

24. The Development Plan is defined by the Town and Country Planning (Scotland) Act 1997, as amended, as being the local development plan; the planning authority's resolution of adoption and any supplementary guidance issued in connection with the local development plan. The Development Plan for the site comprises the Highland-wide Local Development Plan adopted in April 2012 (HwLDP), the Supplementary

Guidance 'Onshore Wind Energy Supplementary Guidance' (amended 2017) (OWESG) and the Caithness and Sutherland Local Development Plan CaSPlan (2018).

25. EIA Report **Chapter 4: Renewable Energy and Planning Policy** sets the proposed development in the context of the relevant Development Plan policies. The Planning Statement provides an assessment of the proposed development against the Development Plan and material considerations relevant to the decision-making process.

3.2.1 Highland-wide Local Development Plan (2012)

26. The HwLDP was adopted in April 2012. THC have advised that they expect to take forward review of the HwLDP (with a view to replacing it with a new Local Development Plan) under the new arrangements for Local Development Plans, with formal work anticipated to start in spring/summer 2022.
27. The HwLDP is therefore the relevant Local Development Plan, however, it is noted that the HwLDP is over 5 years old. The SPP Policy Principles (paragraphs 24 to 57) include a presumption in favour of development that contributes to sustainable development. Where the development plan is more than five years old, this presumption is a significant material consideration where the development plan is more than five years old (paragraph 33). It is also considered that, as the development plan policies are out of date, less weight should be given to those policies in the overall planning balance when determining the application, as compared to more up-to-date policy.

28. The HwLDP Policy most relevant to the proposed development is Policy 67 – Renewable Energy Developments, which sets out THC's support in principle for renewable energy developments. The first part of Policy 67 states:

"Renewable energy development proposals should be well related to the source of the primary renewable resources that are needed for their operation. The Council will also consider:

- The contribution of the proposed development towards meeting renewable energy generation targets; and*
- Any positive or negative effects it is likely to have on the local and national economy;*

and will assess proposals against other policies of the development plan the Highland Renewable Energy Strategy and Planning Guidelines and have regard to any other material considerations, including proposals able to demonstrate significant benefits including by making effective use of existing and proposed infrastructure of facilities."

29. The second part of Policy 67 'Renewable Energy Developments' sets out a number of criteria that must be addressed by wind farm applications. The policy states:

"Subject to balancing with these considerations and taking into account any mitigation measures to be included, the Council will support proposals where it is satisfied that they are located, sited and designed such that they will not be significantly detrimental overall, either individually or cumulatively with other developments (see Glossary), having regard in particular to any significant effects on the following:

- natural, built and cultural heritage features;*
- species and habitats;*
- visual impact and impact on the landscape character of the surrounding area (the design and location of the proposal should reflect the scale and character of the landscape and seek to minimise landscape and visual impact, subject to any other considerations);*

- *amenity at sensitive locations, including residential properties, work places and recognised visitor sites (in or outwith a settlement boundary);*
- *the safety and amenity of any regularly occupied buildings and the grounds that they occupy- having regard to visual intrusion or the likely effect of noise generation and, in the case of wind energy proposals, ice throw in winter conditions, shadow flicker or shadow throw;*
- *ground water, surface water (including water supply), aquatic ecosystems and fisheries;*
- *the safe use of airport, defence or emergency service operations, including flight activity, navigation and surveillance systems and associated infrastructure, or on aircraft flight paths or MoD low-flying areas;*
- *other communications installations or the quality of radio or TV reception;*
- *the amenity of users of any Core Path or other established public access for walking, cycling or horse riding;*
- *tourism and recreation interests;*
- *land and water based traffic and transport interests.*

Proposals for the extension of existing renewable energy facilities will be assessed against the same criteria and material considerations as apply to proposals for new facilities.

In all cases, if consent is granted, the Council will approve appropriate conditions (along with a legal agreement/obligation under section 75 of the Town and Country Planning (Scotland) Act 1997, as amended, where necessary), relating to the removal of the development and associated equipment and to the restoration of the site, whenever the consent expires, other than in circumstances where fresh consent has been secured to extend the life of the project, or the project ceases to operate for a specific period."

3.2.2 Onshore Wind Energy Supplementary Guidance (2017)

30. The OWESG was adopted in 2016 and amended in 2017. The spatial framework presented in the OWESG classifies the site as a Group 2 area, which is an "area of significant protection", but which does not rule out wind farm development, noting that further consideration would be required to demonstrate that any significant effects can be suitably overcome by siting, design or other mitigation. The majority of the areas of the site that have been classified as Group 2 have been so due to the high level mapping of Carbon Rich Soils, deep peat and priority peatland habitat. Group 2 area classification does not exclude wind farm development and the issue of Carbon Rich Soils can be adequately addressed through site design, mitigation and compensation.
31. Further analysis on the OWESG in relation to the proposed development is detailed in Section 5.

3.2.3 Caithness and Sutherland Local Development Plan CaSPlan (2018)

32. The Caithness and Sutherland Local Development Plan (CaSPlan) (August 2018) is an adopted plan which is relevant to the site and wider community. Along with the HwLDP and Supplementary Guidance, it forms part of the Highland Council area Development Plan". The Plan area comprises the settlements of Castletown, Halkirk, Lybster, Thurso, Wick, Ardgay, Bonar Bridge, Brora, Dornich, Edderton, Golspie, Helmsdal, Lairg, Lochinver and Tongue.
33. The CaSPlan (2018) also defines the boundaries of the Special Landscape Areas, in addition to identifying settlements in the area. With regards Special Landscape Areas the CaSPlan states the following: "Special Landscape Areas (SLAs) are regionally valuable landscapes identified to protect and enhance landscape

qualities and promote their enjoyment. HwLDP policy safeguards these areas and is accompanied by a background paper 'The Assessment of Highland Special Landscape Areas'.

34. There are no policies from the CaSPlan that are deemed relevant to the proposed development.

4.0 Design Principles

35. The layout and design of the proposed development was considered as part of an iterative design process aimed at reducing the potential environmental effects of the energy park whilst taking into account site constraints and commercial requirements.
36. The design of any wind farm is driven by the key objective of positioning turbines so that they capture the maximum energy as far as practical within a suitable area, further informed by environmental and technical constraints. The key constraints which were taken into account during the design process included:
- topography and ground conditions (including peat);
 - environmental designations (including SSSI, SPA, SAC and SLA);
 - proximity to East Halladale Flows Wild Land Area;
 - identified landscape and visual constraints;
 - proximity to residential receptors (with regards visual amenity, shadow flicker and noise);
 - presence of ornithology, protected habitats and species;
 - presence of watercourses, private water supplies and related infrastructure;
 - presence of cultural heritage features;
 - aviation and radar constraints;
 - recreation resource (such as Core Paths);
 - forestry; and
 - fixed communications links.
37. The findings of the technical and environmental studies undertaken for the EIA were used to inform the design of the proposed development, and hence achieved a 'best fit' within the environment of the proposed development site. Where potentially significant effects were identified, efforts were made to avoid these through evolving the design of the proposed development, 'embedding' mitigation into the design. 'Embedded mitigation' includes but is not limited to:
- sensitive siting of the proposed infrastructure incorporating appropriate buffer distances from environmental receptors (including nearby residential properties) to avoid or reduce effects;
 - considering the size and scale of the proposed development appropriate to the location;
 - considering the appearance, finish and colour of wind turbines and the control building in accordance with SNH Guidance 'Siting and Designing Wind Farms in the Landscape', V3 (SNH, 2017);
 - design of the tracks to minimise cut and fill, reducing landscape and visual effects as well as costs;
 - inclusion and design of borrow pit(s) to minimise the amount of the material required to be imported to site; and
 - potential for up to 25m micro-siting of infrastructure during construction to ensure the best possible location is chosen based on site investigations (25m micro-siting allowance, rather than a larger allowance, is proposed to ensure that the integrity of the linear design is maintained at construction stage).
38. Throughout the design evolution of the proposed layout, a key driver was the consideration of potential landscape and visual effects on receptors, including how the proposed development would relate to the

baseline landscape character. In particular, regard was given to the scale and number of turbines proposed and the way in which the proposed development would be viewed by key receptors, in particular, residents within Strath Halladale itself and from travellers on the A836 heading westward (transitioning from the flatter more developed landscapes of Caithness into the more rugged, remote landscapes of Sutherland) and also travelling along the A897 within Strath Halladale. Further to this, how the proposed development would be seen from East Halladale Flows Wild Land Area, was also a consideration during the design of the layout.

39. The design process analysed the key landscape elements and visibility of the proposed development and its surroundings. Based on the findings of this analysis and field reconnaissance, a number of key factors went on to inform the design of the layout, including:
- the raised position of the site, on the slopes of Strath Halladale;
 - the linear nature of Strath Halladale and how this affects the pattern and extent of visibility;
 - the location and sensitivity of key visual receptors including designated landscapes, residents of nearby residential properties and settlements, road users and walkers; and
 - the landscape character of the site - upland sloping moorland.
40. Considerable effort was made to produce a turbine layout which achieves the most satisfactory relationship with the landform of the site whilst respecting other environmental, technical and economic considerations. On numerous occasions, a multi-disciplinary team met to discuss the various issues which were identified as part of the constraints mapping process. The team identified the optimal locations for the proposed turbines and associated infrastructure.

5.0 Design Evolution

41. The proposed development would be located in the Sweeping Moorland and Flows Character type area (LCT 134) as defined in NatureScot digital map based Landscape Character Assessment (2019). The key characteristics of this area are described in the NatureScot document as follows:

- *“Gently sloping or undulating landform which lies generally below 350 metres;*
- *Occasional isolated hills of limited height form local landmark features;*
- *Lochs and mature, meandering rivers;*
- *Very distinct flora, dominated by sphagnum mosses, produced by the wetness and infertility of the flows;*
- *Areas of peat cuttings and haggings;*
- *Pockets of improved grazing, mainly within the outer fringes of sweeping moorland;*
- *Coniferous forest forming a dominant characteristic within some parts of this landscape character type;*
- *Ribbons of broadleaf woodland occasionally run along the water courses and loch edges;*
- *Very sparsely settled with dispersed crofts, farms and estate buildings largely found on the outer edges of this landscape or near a strath;*
- *Vehicular tracks within parts of the landscape;*
- *Wind farms, transmission lines, the A9 and a network of minor roads are key features within the more modified outer fringes within Caithness;*
- *Long, low and largely uninterrupted skylines offering extensive views across this landscape and result in a feeling of huge space;*
- *Consistent views to the distant Lone Mountains and Rugged Mountain Massif – Caithness & Sutherland;*
- *Great sense of exposure on areas of flat peatland on upland plateau; and*
- *A strong sense of remoteness is associated within the largely uninhabited, inaccessible core flows and moorlands of this landscape.”*

42. The NatureScot document details the Landscape Character Description as follows:

“Landform

This flat, gently undulating and generally smooth landform largely accords with areas of blanket bog and supports a diverse range of wet heath, grassland and mire. Occasional isolated hills, such as Ben Alisky and Ben Dorrery, stand out amidst extensive areas of lower-lying moorland, despite their limited height. Sweeping moorlands often have lochs and mature meandering rivers which sit within the shallow valleys and basins in the landscape creating focal features. Large areas of flatter peatlands, the Flows, lie within the core of Caithness and are patterned with a dominant intricate network of water courses, dubh lochans and a diverse range of pool systems, with wet, spongy, vegetation. The Flows areas merge gradually with surrounding sweeping moorland.

Landcover

This Landscape Character Type has a simple composition of moorland and mire, which forms low, smooth and largely uninterrupted skylines, and huge skies resulting in a high degree of exposure and extensive visibility. The ground-hugging vegetation of the blanket bog accentuates the predominant smoothness of the terrain. Some areas of the distinct flora of sphagnum mosses are particularly conspicuous on account of

their vibrant colours. Areas of peat cutting and haggling create dark brown scarring, conspicuous amidst heather and grass-dominated moorland and mosses. Where pockets of improved grazing exist on the outer fringes of the moorland these areas appear as green islands within the surrounding rough vegetation. They tend to relate to the present or past location of farm or croft buildings and their enclosures. Coniferous forestry has a strong presence in some areas, particularly the more modified outer fringes, interrupting the continuity of the moorland cover. Removal of forest and restoration of areas of underlying blanket bog is being undertaken in some locations. Fragments of broadleaf woodland along water courses and loch edges mainly comprise birch, alder, willow and rowan species.

Settlement

This is currently a very sparsely settled landscape. However, the Landscape Character Type encompasses a huge land area and contains a broad range of monuments. Evidence for early prehistoric settlement in more favourable locations is evidenced through the presence of chambered cairns, other forms of burial cairns and occasional stone settings. Later prehistoric monuments include burnt mounds, hut circles with their attendant field systems, and brochs. Settlement continued into the medieval period, with farms and crofts occupying the most fertile ground, and shieling activity in more remote locations. The 18th and 19th Centuries saw the abandonment of many farms and crofts in favour of sheep rearing, but today most of the folds and shelters built at this time are ruinous. Settlement today takes the form of dispersed crofts, farms and estate buildings on outer reaches of the Landscape Character Type, or near straths. The location of ruined buildings, field boundaries and drainage channels represent a history of past depopulation. Archaeological features are notably rich at the transition with the Strath – Caithness & Sutherland and Coastal Crofts and Farms Landscape Character Types. Vehicular tracks are used mainly to provide access for deer stalking and to fishing lochs and peat cuttings. The Inverness/Thurso railway is aligned through the core of this character type and single track roads, such as the A836, cut through areas of sweeping moorland in the west. Within Caithness the A9 and a network of minor roads, as well as wind farms and transmission lines, are more prominent features within the more modified outer fringes of the Landscape Character Type.

Perception

The landscape has a strong sense of naturalness and remoteness, particularly at its core away from more settled and modified outer fringes. Their distinctly natural character is heightened by a rich diversity of birds, including plover and curlew, whose evocative calls contribute to the perception of wildness. The Sweeping Moorland and Flows forms the setting to the Lone Mountains, the distinctive form and prominence of these mountains being accentuated by the simple, open and expansive nature of the low-lying moorland which surrounds them. Some areas of flat peatland occur on areas of upland plateau, for example, Knockfin Heights and also on the top of cliffs along the north coast of Caithness. The elevation of these areas and their surrounding space creates an even great sense of exposure, particularly upon the edges of the landform, where distant views across land and sea are afforded. Views are long with uninterrupted largely uninterrupted skylines. Rapidly changing light and weather conditions are reflected in the smooth vegetation cover and loch systems. The Sweeping Moorland and Flows are important in providing a simple foreground to views of distant Lone Mountains and Rugged Mountain Massif – Caithness & Sutherland, complementing the distinctive form of these mountains and accentuating their height and prominence. Views from the A9 between Latheron and Spittal, the B871, A836 and from the A838 across the low-lying moorland of A'Mhoine to the distant mountains are particularly dramatic.”

43. The site of the proposed development is also considered by the OWESG to be within the Sweeping Moorland and Flows Landscape Character Area (CT4: Central Caithness). The key landscape sensitivities of this area are described in the OWESG as follows:

“Gently sloping or undulating landform with strong horizontal composition, which whilst expansive and large in scale entails that any vertical features are highly prominent. Simplicity of composition comprising dominant land:sky horizon, which Landscape Sensitivity can be interrupted by vertical elements. Long, low

and largely interrupted skylines offer extensive views. Lone Mountains punctuate the horizon and are important landmarks to the immediate south such as Scaraben, and further west at a greater distance are Ben Loyal and Ben Hope. There is a strong sense of remoteness and wildness within the core of the Flows and Moorlands as they are largely uninhabited and difficult to access and have an overriding natural character. To the south, large commercial forestry blocks appear as dark bands. Pylon lines punctuate CT4, running parallel to the A9T. The expansion of the substation south of Spittal is visually prominent. To the west the relatively abrupt transition from the more rugged Sutherland landscape character to the open flatter landform of Caithness provides a key gateway and is highly sensitive to windfarm development in the immediate and wider landscape (given wide open views) that would erode the clarity of this transition and interrupt experience of moving from one regional landscape to another.”

44. On a scale of 1-4 (1 being most susceptible to change), the OWESG rates Landscape Character Area CT4 as ‘3’ for sensitivity of accommodating ‘Large Scale Wind Farms’.
45. Whilst confirming that the CT4 Landscape Character area already contains wind farm and electricity infrastructure in certain areas, and suggesting that the overall Landscape Character area is less susceptible to change from large scale wind farms, the OWESG advises that there are significant constraints to wind energy development. This is particularly the case for the western edge of the Landscape Character area and the transition between Caithness and Sutherland.
46. Based on a review of these background documents, taking account of NatureScot’s Siting and Design Guidance (2017), drawing on fieldwork observations, and considering the factors set out in Section 4, the following design objectives were identified for the site:
- Reduce the extent of the proposed development visible and consider the appearance of the turbines from the SLAs along the northern coastline, particularly Farr Bay, Strathy and Portskerra SLA;
 - Reduce the potential effects on the Wild Land Area 39 as far as possible through consideration of the design/layout of the turbines and ancillary infrastructure, including avoiding the need for visible aviation lighting;
 - Ensure an organised and well balanced layout from views along the A836 (heading west), transitioning from Caithness into Sutherland;
 - Reduce the potential effects on views from within Strath Halladale, particularly for residential receptors and people travelling along the A897, by creating an organised and well balanced layout; and
 - Minimise the extent of the proposed development visible from the more populated areas of Melvich and Portskerra.
47. The evolution of the design and layout of the proposed development was an iterative constraint-led process driven by the technical and environmental studies undertaken for the EIA. It involved review of multiple layouts and related wirelines from key landscape and visual receptor locations in the study area, and adjustment to turbine locations to reduce potentially adverse landscape and visual impacts insofar as possible, whilst also taking into consideration the energy generation, other environmental, technical and economic considerations.

5.1 Wind Turbine Layouts

48. The initial potential development area (for wind turbines) within the site boundary was established using constraints mapping. Constraints such as deep peat (>1.5m depth), steep slopes (>8°), watercourses and fixed communications links were mapped as hard constraints, whereas others such as peat depths between 1m – 1.5m were mapped as soft constraints. This constraints mapping was used to identify the areas within

the site which may be suitable for wind turbines. The design optimisation process was iterative, involving review of multiple layouts and related wirelines from key landscape and visual receptor locations in the study area, and adjustment to turbine locations to reduce potentially adverse landscape and visual impacts insofar as possible, whilst also taking into consideration the energy generation, particularly seeking to maintain wake loss expectations, other environmental, technical and economic considerations.

49. Five of the key design iterations, from a landscape perspective, are shown on **Figure 7** and comprise the initial Maximum site layout (Layout A), the Pre-Application Advice layout (Layout B), the Scoping Layout (Layout C), the Scoping Addendum Layout (Layout D) and the Design Freeze Layout (Layout E: the proposed development). The layouts and their rationale are also detailed in the following paragraphs.

5.1.1 Layout A (Initial Maximum Layout)

50. This initial layout was developed prior to commencement of the EIA and was the output from a Landscape and Visual feasibility study commissioned by Wind2 in 2020. This feasibility study focused on maximising the number of turbines within the site area, taking into account only the following non landscape and visual related constraints: watercourses, slope, fixed telecoms links and the SSSI / SPA that extends into the western part of the site. Landscape and visual effects, as well as other environmental concerns e.g. peat depth, were not considered at this stage.
51. This layout had 15 turbines at a height of up to 149.9m to tip height. Wirelines of this initial layout are shown on **Figure 8a** and **Figure 8b**.
52. As a result of the initial EIA landscape and visual assessment work, this layout was deemed to be too visible from the settlements of Melvich, Portskerra and Strathy, as well as along a large stretch of the coastline and A836.

5.1.2 Layout B (Pre Application Advice Layout)

53. As a result of Layout A being deemed too visible from various receptors / locations to the north of the site (Melvich and Portskerra, and westbound travellers on the A836), three turbines that were located in the conifer plantation at the north of the site were dropped. These turbines were the most prominent from receptors / locations to the north and north west of the site and so this was deemed a notable improvement from a landscape and visual perspective.
54. Other relatively minor turbine movements were implemented from the previous (Layout A) layout, predominantly to accommodate other non landscape related constraints e.g. peat depth.
55. This layout had 12 turbines at a height of up to 149.9m to tip height and was presented at the Pre-Application Advice meeting between the applicant, THC, NatureScot and the ECU. Wirelines of this layout (Layout B) are shown on **Figure 8a**, **Figure 8b**, **Figure 9a** and **Figure 9b**.

5.1.3 Layout C (Scoping Layout)

56. The layout that was submitted as part of the Scoping Request for the proposed development was again a 12 turbine scheme, with tip heights of up to 149.9m.
57. The turbine locations were altered from Layout B in order to refine the scheme from a landscape and visual perspective (reduced stacking from VPs to the north), as well as avoiding deeper areas of peat. The proximity of turbines to steeper slopes and the predicted wake loss also contributed to the moving of the turbine locations. The turbine movements were all relatively small (less than 100m) from the 'Pre Application Advice layout'.

58. Wirelines of this layout (Layout C) are shown on **Figure 9a, Figure 9b, Figure 10a and Figure 10b.**

5.1.4 Layout D (Scoping Addendum Layout)

53. Shortly prior to receiving the Scoping Opinion from the ECU, the applicant reached agreement to include an area of land immediately to the south of the site boundary presented in the March 2021 Scoping Report. As a result of this, the site boundary was extended southward, increasing the site area by approximately 45.46ha from 414.5ha to approximately 459.96ha.
54. The 12 turbine 'Scoping Layout' was updated with a further two turbines located on the additional land at the southern end of the site. This layout was therefore 14 turbines at a height of up to 149.9m to tip height.
55. From a landscape and visual perspective, the addition of these two turbines at the south of the site did not fundamentally alter how the proposed development would be seen or perceived from key views within Strath Halladale and for westbound travellers along the A836. This layout was the subject of the public exhibition in Strath in October 2022.
56. Wirelines of this layout (Layout D) are shown on **Figure 10a, Figure 10b, Figure 11a and Figure 11b.**

5.1.5 Layout E (Design Freeze – The Proposed Development)

56. Following on from the Scoping Addendum layout there was considerable refinement of the design from a landscape and visual perspective (in addition to other environmental considerations). This was primarily as a result of consultee feedback during Scoping, feedback from the public during the first public exhibition, and ongoing site assessment work.
57. The eastern most turbines in the Scoping Addendum layout (T 3, 5, 7, 9 and 11 in particular) were considered too close to several properties along the A897, which were also orientated towards the site. Further to this, due to the (roughly) two parallel north-south rows of turbines which characterised the Scoping Addendum layout, there was considerable stacking and overlapping of turbines from several key views, including westbound travellers along the A836 and locations within Strath Halladale.
58. As a result of these landscape and visual considerations, turbines 3, 5, 7, 9 and 11 were removed. The remaining turbines were moved as far west as possible, whilst maintaining an appropriate separation distance with the nearby SPA/SSSI/SAC designations, and positioned in a single, slightly arcing, north-south orientated row. Through curving the northern part of the single row of turbines east, two turbines were able to be added back into the layout without compromising separation distances or leading to turbine stacking from key views.
59. Adopting this approach to the layout simplified the form and appearance of the proposed turbines. The elevation of the turbines was kept as consistent as possible along the line, with the spacing between turbines also kept consistent. There are relatively few locations where the turbines would be seen from the north and south, where the turbines would be seen stacked or overlapping (this is also true for westbound travellers on the A836 transitioning from Caithness into Sutherland). However, the turbines would be seen in direct and oblique views from locations in the surrounding context, with key considerations being receptors in Strath Halladale to the east and along the coastline to the north. The arrangement of the turbines in a single line follows the pattern of the local landform, and the north – south orientation of Strath Halladale. The consistent spacing and elevation of the turbines simplifies the appearance of the proposed development and avoids the clustering and stacking of turbines associated with earlier design iterations. Where possible the turbines have also been positioned away from the slopes and landform adjacent to the

eastern side of Strath Halladale to provide more separation from the valley landform and the East Halladale Flows Wild Land Area. Layout E is therefore considered to be more in line with the design objectives detailed in paragraph 46, than the previous layouts assessed (layouts A to D).

60. Wirelines of this layout (Layout E) are shown on **Figure 11a** and **Figure 11b**.

5.2 Other Site Infrastructure

5.2.1 Site Access

57. Access to the site would be from the A836, taking the Kirkton farm road (near Loch Mor) southward to Kirkton farm, and continuing south onto the site.
58. For abnormal loads coming from the east (port of Scrabster) to access the Kirkton Farm road, it will be necessary for the vehicles to continue on the A836 past the Kirkton Farm road entrance, turn, and approach from the north / west. As a result of this, two potential turning areas (only one would be developed) have been designed and are included in the proposed development. These two abnormal loads turning area options are located at NGR NC 85250, 65287 (Turning Area A (Western Turning Area), **Figure 4**) and NGR NC 87786, 64983 (Turning Area B (Eastern Turning Area), **Figure 5**). An annotated aerial image of Turning Area B, the eastern turning area which is located within Melvich, is provided in **Figure 12**.

5.2.2 Site Tracks

57. The onsite access tracks have been designed to use existing tracks as far as possible, whilst reducing cut and fill requirements wherever possible in order to reduce the amount of ground disturbance, amount of material required for construction, loss of sensitive habitats and landscape and visual effects, particularly during construction.
58. Access tracks have been designed to follow routes which, in the main, do not exceed gradients of 12°. This gradient is specified by a number of turbine manufacturers in their technical specifications to permit safe delivery of turbine components and associated parts.
59. To the east of turbines 5 and 6 there are four relatively short sections of floated track included as part of the proposed development. Consideration was given to alternative routing options in order to avoid needing to propose floated track, however due to site topography (slope steepness) it was considered that the track could not turn and traverse from the east to the west side of the site at a point north enough to avoid the area of deep peat in the centre of the site. Running the onsite track from turbine 4, south to turbine 5 was also considered, however due to the size of the intervening valley and watercourse this would have required a large and complex bridge structure, which would have been visible from Strath Halladale and the A836.

5.2.3 Borrow Pits

60. Up to two borrow pits would be required as a source of rock to be used in the construction of the tracks, hardstandings and foundations. On site borrow pits have been sought in order to reduce the need to transport large quantities of aggregate to the site. There is a sand and natural aggregate quarry located near the junction of the A836 and Kirkton Farm road from which aggregate material could be utilised for initial construction of site tracks, laydown areas and required earthworks or cut and fill. The sand and natural aggregate quarry is not considered to have the size and type of aggregate required for hardstanding or foundations, hence the requirement for onsite borrow pits.

61. Search area locations for the borrow pits have been identified based upon a review of geological mapping and site reconnaissance by a geological specialist. The location of each was considered with respect to the site infrastructure and environmental constraints, including landscape and visual impacts. **Figure 14** shows a cumulative ZTV for both borrow pit search areas. The location of the two borrow pit search areas has primarily been driven by where it is considered that appropriate aggregate can be won in sufficient quantities. However, consideration has been given to potential landscape and visual impacts arising from the proposed borrow pits. As such, both borrow pits are located towards the north of the site, with more limited visibility from the southern part of Strath Halladale. The most prominent views of the borrow pits would likely be from the north of Strath Halladale and the A836. The borrow pits would be seen from these locations in the context of the existing sand and gravel quarry immediately north of the site. However, they would comprise short term elements of the proposed development, being restored on completion of the construction phase.
62. Further intrusive geotechnical investigations would be carried out to identify which of the two proposed borrow pits would yield the required quality of rock for each aspect of the infrastructure.

5.2.4 Temporary Construction Compound

63. The temporary construction compound would be located at the north of the site, near to the site entrance at NGR NC 88486 61060. This location is considered appropriate as it:
- has appropriate topography;
 - is located in an area of shallow peat and low peat slide risk; and
 - avoids sensitive habitat areas.
64. Visibility of the temporary construction compound would be minimal from key viewpoints due to its low laying location.

5.2.5 Substation Compound

65. The proposed substation compound would be located to the north of the site at NGR NC 88717 61157. The location is considered appropriate as it:
- has appropriate topography (slope);
 - is located in an area of shallow peat and low peat slide risk;
 - avoids sensitive habitat areas;
 - is lower down in the landscape than the wind turbines and as such less visible;
 - is positioned lower (on floor of) in Strath Halladale and links the substation compound better with existing pattern of development (houses, farm buildings etc.);
 - is adjacent to existing electricity infrastructure (overhead lines); and
 - is screened from views from the north due to established and newly planted woodland.
66. The control building and battery storage, within the substation compound, would be located greater than topple distance from the proposed turbines. The internal site grid connection cables would be undergrounded within the site from each turbine to control the building, therefore avoiding visual impact. **Figure 15** shows a ZTV for the proposed substation compound (the equipment/ buildings within the substation compound have varying heights, so for the purposes of the ZTV an indicative height of 5m has been used).

5.3 The Proposed Development Considered Against Design Objectives

67. The iterative design process has tried to ensure a balance between environmental and technical constraints, landscape and visual considerations and economic viability. Whilst giving due consideration to these various competing elements, the final layout forming the proposed development is considered to largely meet the set landscape and visual design objectives detailed in paragraph 46. How the proposed development meets these design objectives is considered below.

Design Objective	Design Evolution	Outcome
Reduce the extent of the proposed development visible and consider the appearance of the turbines from the SLAs along the northern coastline, particularly Farr Bay, Strathy and Portskerra SLA	<p>Eastern 'row' of turbines removed to avoid stacking seen from the Farr Bay, Strathy and Portskerra SLA.</p> <p>Tip heights kept below 150m to minimize hubs visible from Farr Bay, Strathy and Portskerra SLA.</p>	Figure 15 from Strathy Point highlights that visibility of the proposed development from the SLAs along the northern coastline would be limited.
Reduce the potential effects on the Wild Land Area 39 as far as possible through consideration of the design/layout of the turbines and ancillary infrastructure, including avoiding the need for visible aviation lighting	<p>Eastern 'row' of turbines removed to avoid stacking seen from Wild Land Area 39.</p> <p>Tip heights kept below 150m to avoid the need for visible aviation lighting.</p> <p>Turbines positioned as far west within the site boundary as possible i.e. as far away from Wild Land Area 39 as possible (SSSI / SPA designations being the key constraining factor in how far west turbines could be located).</p>	<p>Figures 16, 17, 18 and 19 are taken from Wild Land Area 39. Figure 18 (Viewpoint 8 (C)) is from Beinn Ratha, within the Wild Land Area, looking west. From this location and direction, the proposed development would be visible as a single row of turbines with even spacing. The turbines would be visible predominantly below the horizon line, with the operational Strathy North and Bettyhill Wind farms visible behind. Figure 16 (Viewpoint A) is from Loch na Carroach within the Wild Land Area, looking west. From this location, the proposed development would be clearly visible as a single row of turbines with even spacing. The turbines would be seen above the horizon line, with the operational Strathy North Wind Farm visible in the background. Figure 17 (Viewpoint B) is from Cnoc Bad Mhairstein within the Wild Land Area, looking north west. From this location the proposed development would be visible as a single row of turbines with even spacing. The turbines would largely be seen against the land in the background, however turbine tips would be seen above the horizon line. The operational Strathy North Wind Farm would be visible in the background to the south, with the sea and Melvich/Portskerra just visible to the north. Figure 20 (Viewpoint D) is from Beinn nam Bad Mor within the Wild Land Area, looking north west. From this location, the proposed development would be visible as a single row of turbines with even spacing. The turbines would largely be seen against the land in the background, however some turbine tips may be seen above the horizon line. The operational Strathy North and Bettyhill Wind Farms are just visible in the distance, behind the proposed development. There would be no need for any visible aviation lighting as part of the proposed development, which would limit</p>

Design Objective	Design Evolution	Outcome
		visibility of the proposed development during hours of darkness.
Ensure an organised and well balanced layout from views along the A836 (heading west), transitioning from Caithness into Sutherland	<p>Eastern 'row' of turbines removed to avoid stacking seen from westbound views from the A836.</p> <p>Even spacing of the single row of turbines in order to give a clean and balanced layout when seen from westbound views from the A836.</p>	<p>Figure 20, shows a view of the proposed development from a layby off the A836 heading west. This would be a 'gateway' (as identified in the OWESG) view for travelers heading from Caithness to Sutherland. Figure 20 shows that the proposed development would be clearly visible from this location, and seen largely above the horizon line. However due to the linear, north to south layout of turbines, its appearance from this location is considered to be organised and well balanced, with largely consistent spacing between turbines</p>
Reduce the potential effects on views from within Strath Halladale, particularly for residential receptors and people travelling along the A897, by creating an organised and well balanced layout	<p>Eastern 'row' of turbines removed to avoid stacking seen from within Strath Halladale / the A897.</p> <p>Even spacing of the single row of turbines in order to give a clean and balanced layout when seen from within Strath Halladale / the A897.</p> <p>Turbines positioned as far west within the site boundary as possible i.e. as far away from the floor of Strath Halladale and the A897 as possible (SSSI / SPA designations being the key constraining factor in how far west turbines could be located).</p>	<p>Figure 21 shows a view of the proposed development from within Strath Halladale looking north west. Figure 22 shows a view of the proposed development from within Strath Halladale looking south west. From both of these locations in the north of Strath Halladale, the proposed development is clearly visible and seen largely above the horizon line. However due to the linear, north to south layout of turbines, its appearance from these locations is considered to be organised and well balanced, with largely consistent spacing between turbines.</p>
Minimise the extent of the proposed development visible from the more populated areas of Melvich and Portskerra	<p>Eastern 'row' of turbines removed to reduce the number of turbines (and hubs) seen from the southern edge of Melvich.</p> <p>No turbines located within the northern conifer forestry block within the site, in order to reduce the number of turbines visible from Melvich and Portskerra.</p>	<p>Figure 23 and Figure 24 show views south towards the proposed development from Melvich and Portskerra respectively. As these Figures show, there would be minimal visibility of the proposed development from either of these settlements.</p>

68. The final layout for the proposed development is considered to largely meet the design objectives set out in paragraph 45. Whilst the proposed development would be clearly visible from certain locations along the A836, A897 within Strath Halladale, and within Wild Land Area 39, it is considered that the size of the turbines and the use of a single row of evenly spaced turbines results in a clean and orderly layout. The legibility of the layout is enhanced by following the north to south orientation of Strath Halladale, ensuring that stacking of turbines from most key views is kept to a minimum.

6.0 Proposed Development

69. The proposed development is described in detail in **Chapter 3** of the EIA Report. An outline Construction and Environmental Management Plan (CEMP) is contained in the EIA Report as **Technical Appendix 3.1**. The layout of the proposed development is contained in **Figure 25**. In summary the proposed development would comprise:

- 11 wind turbines including internal transformers, with blade tip heights of up to 149.9m;
- 11 turbine foundations (approximately 25m diameter) and associated crane hardstandings (approximately 35m x 35m and 1m in depth, with an area for additional crane pads that is 85m x 5m);
- approximately 2.03km of upgraded access tracks, and approximately 5.48km of new access tracks with a typical running width of 5m (wider at bends and junctions) and associated drainage. 446.95m of the new track is anticipated to be floating track where consistent peat depths of 1-1.5m or greater are identified along with shallow topography (below 12°);
- approximately 7.5km of underground cabling along access tracks to connect the turbine locations, and the onsite electrical substation;
- one onsite substation which would accommodate 33kV Switchgear to collect electricity from different parts of the site. The substation compound, which will incorporate up to 20MW of battery storage would have an area of 75m x 100m and would include a control and metering building (approximately 14m x 23 m and 7m high);
- up to two borrow pit search areas (covering approximately 32,000m²);
- a temporary construction compound (125m x 50m);
- clearance of 87.75ha of conifer forest (net area of 70.75ha bearing trees); and
- clearance of 3.58ha of deciduous woodland.

70. A location for a new substation compound has been identified within the site, which would be utilised for a grid connection. The onsite substation would step up the voltage for transmission to the grid network. The grid connection point is anticipated to be Connagill Substation located just to the east of the proposed development.

7.0 Public Access

7.1.1 Public Access – Pedestrian

71. Public access to the site would be restricted during the construction of the proposed development for obvious health and safety reasons due to construction activities, the movement of heavy plant and the erection of turbines. EIA Report **Chapter 14: Socio-Economics and Land Use** concludes that the impact on users would be negligible and not significant. When operational, however, there would be no formal access arrangements implemented and members of the public would be able to access the site on foot and make use of the access tracks under the provisions of the Land Reform Act.
72. During periods of maintenance, access by the public could be restricted depending on the nature of the maintenance activity.

7.1.2 Public Access – Vehicular

73. Once the proposed development is operational (if consent granted) vehicular access will be limited to individuals directly involved in the maintenance of the energy park, the landowners and their agents, and emergency vehicles.

8.0 Conclusion

74. The layout of the proposed development has evolved through an iterative EIA and design process. Constraints identified throughout the EIA process were avoided, and potential impacts of the proposed development avoided or reduced by the design. EIA studies were used to achieve a 'best fit' within the environment of the site. Access to the site will largely use existing tracks in order to minimise construction work and environmental impacts.
75. The final layout of the proposed development comprises a single cohesive row of 11 turbines, with a north to south orientation. This is considered to be the most appropriate number of turbines to be accommodated by the site, balancing both energy yield and contribution towards renewable energy generation targets, with key planning and environmental constraints. The proposed turbine blade tip height, of up to 149.9m, also allows for the maximisation of energy yield at the site, without introducing visible aviation lighting to Strath Halladale and the wider area.

9.0 References

Town and Country Planning (Scotland) Act 1997 (as amended).

Scottish Planning Policy, Scottish Government 2014.

PAN 68 - Design Statements, Scottish Government 2003.

Scottish Natural Heritage (2017) Siting and Designing Wind Farms in the Landscape Version 3.

Highland-wide Local Development Plan (2012).

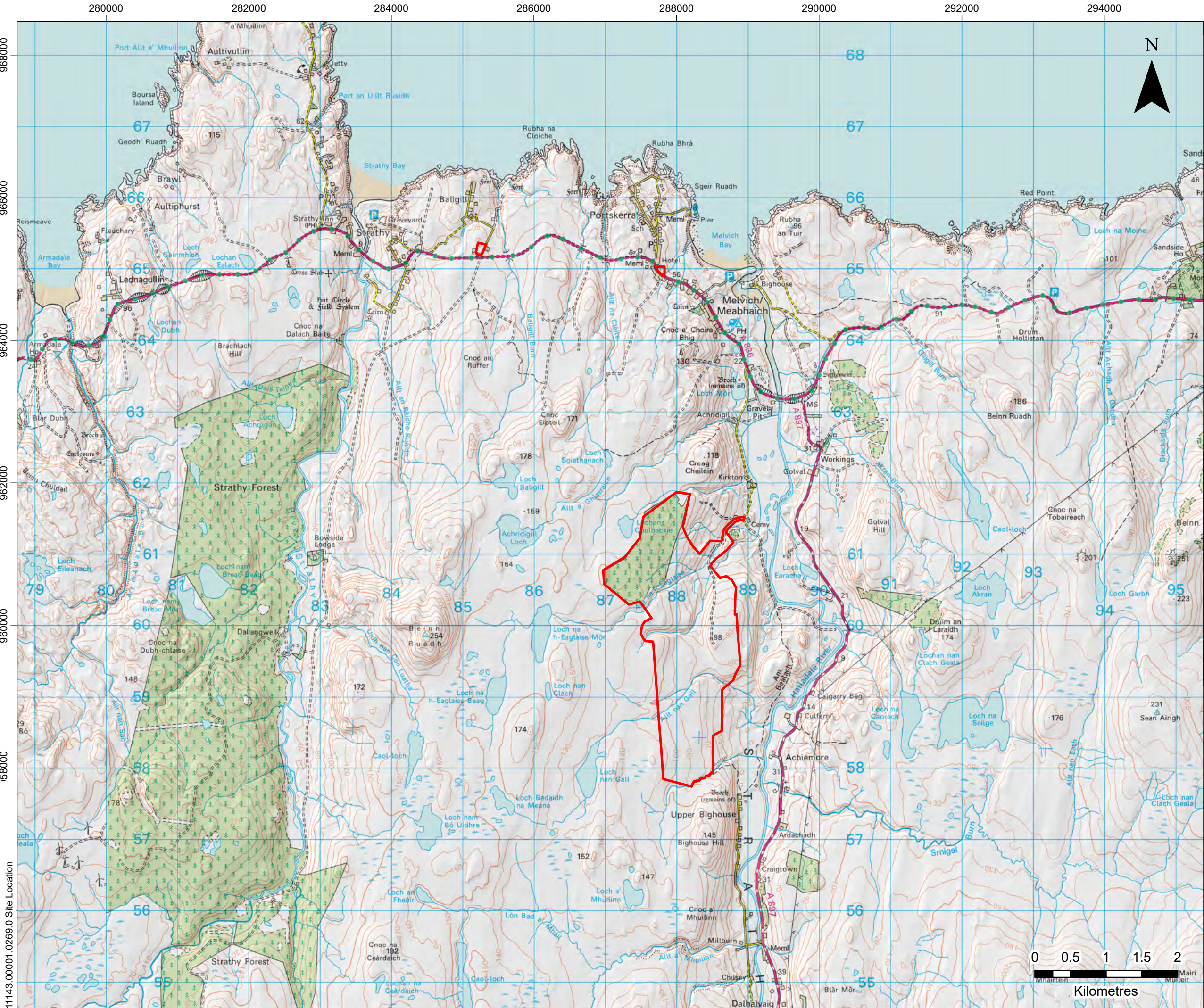
Onshore Wind Energy Supplementary Guidance (2017).

Caithness and Sutherland Local Development Plan (CaSPlan) (2018).

The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017.

The Electricity Act 1989.

FIGURES



LEGEND

Application Boundary

KIRKTON WIND FARM LTD

4/5 LOCHSIDE VIEW
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KIRKTON ENERGY PARK - EIA

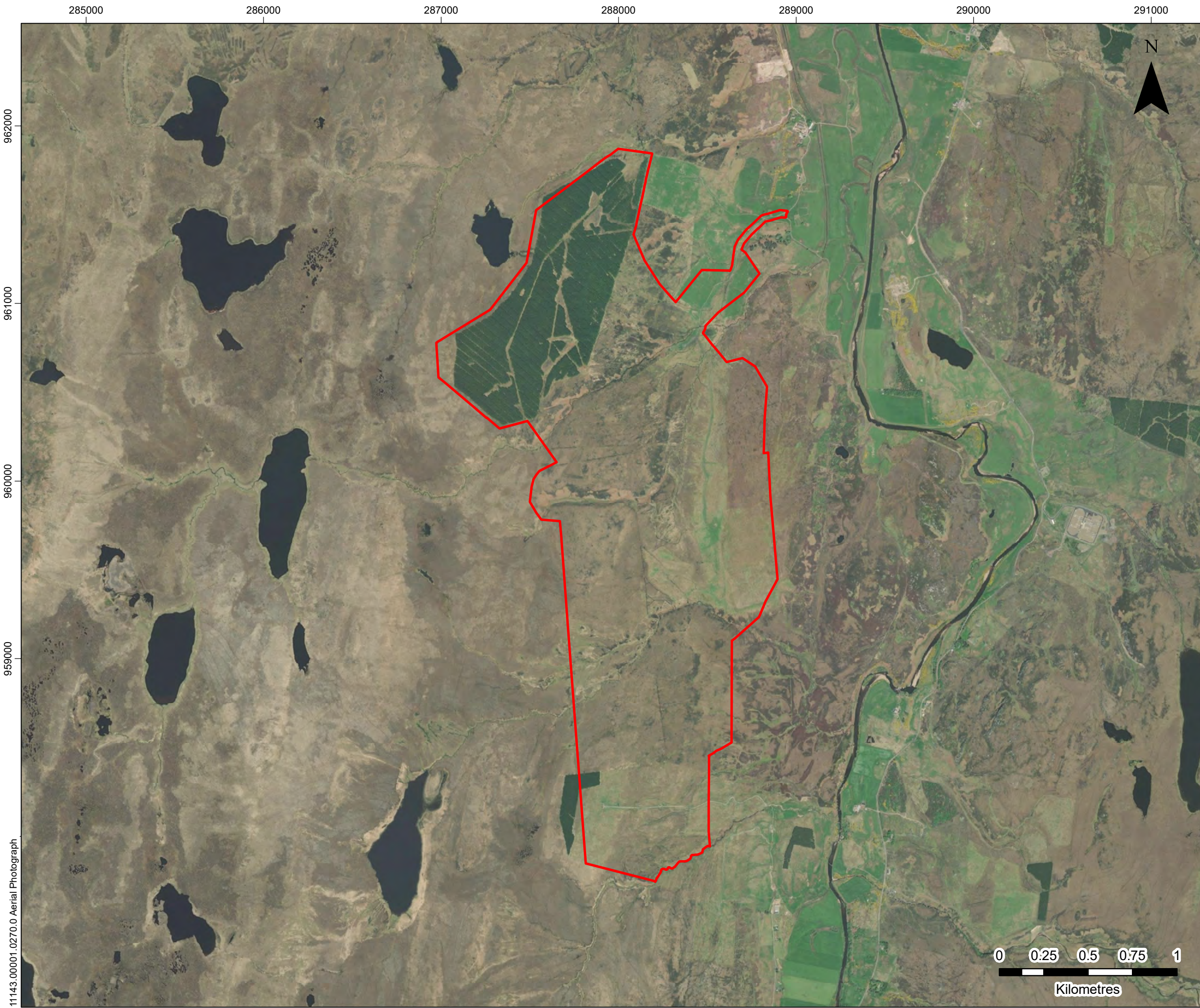
DESIGN & ACCESS STATEMENT


SITE LOCATION

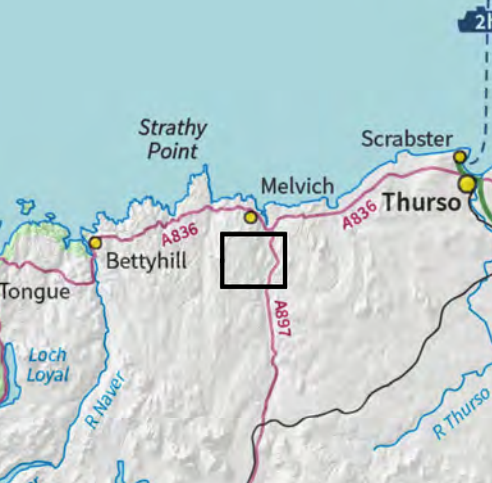
FIGURE 1

Scale 1:50,000 @ A3


Date NOVEMBER 2022



LEGEND
 Application Boundary



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DESIGN & ACCESS STATEMENT

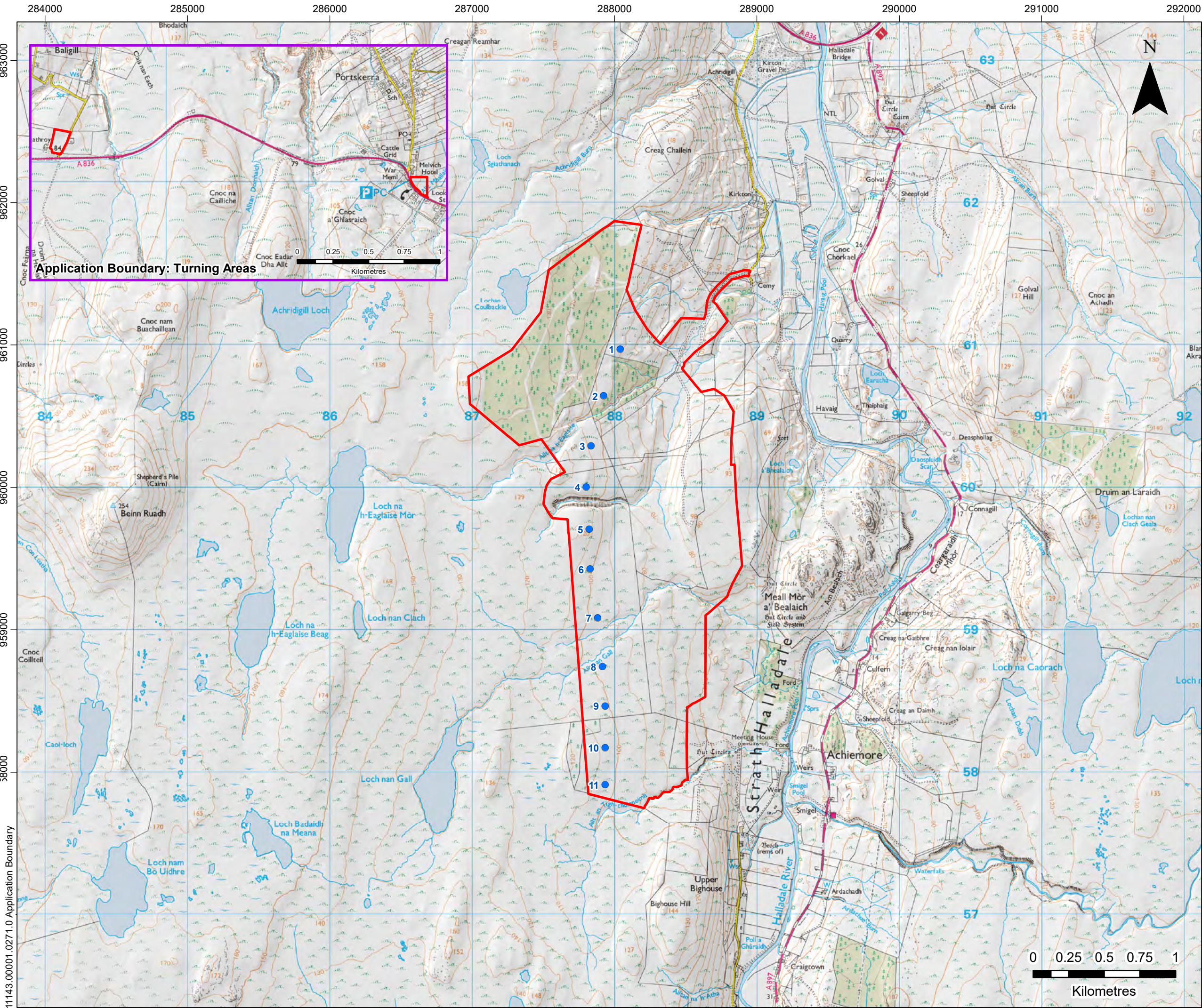
AERIAL PHOTOGRAPH

FIGURE 2

Scale1:20,000 @ A3

DateNOVEMBER 2022

11143.00001.0270.0 Aerial Photograph



LEGEND

- Application Boundary
- Proposed Turbine

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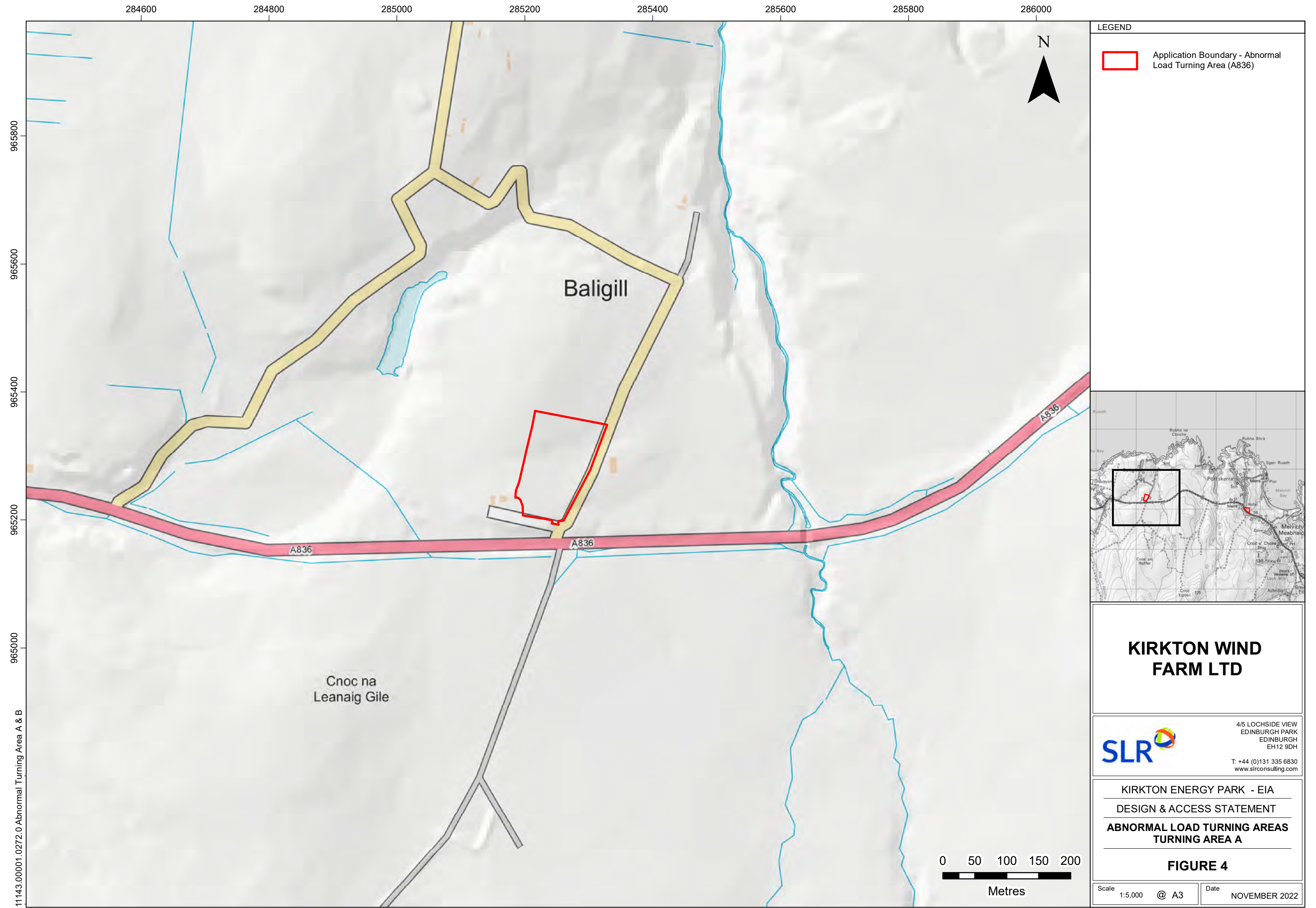
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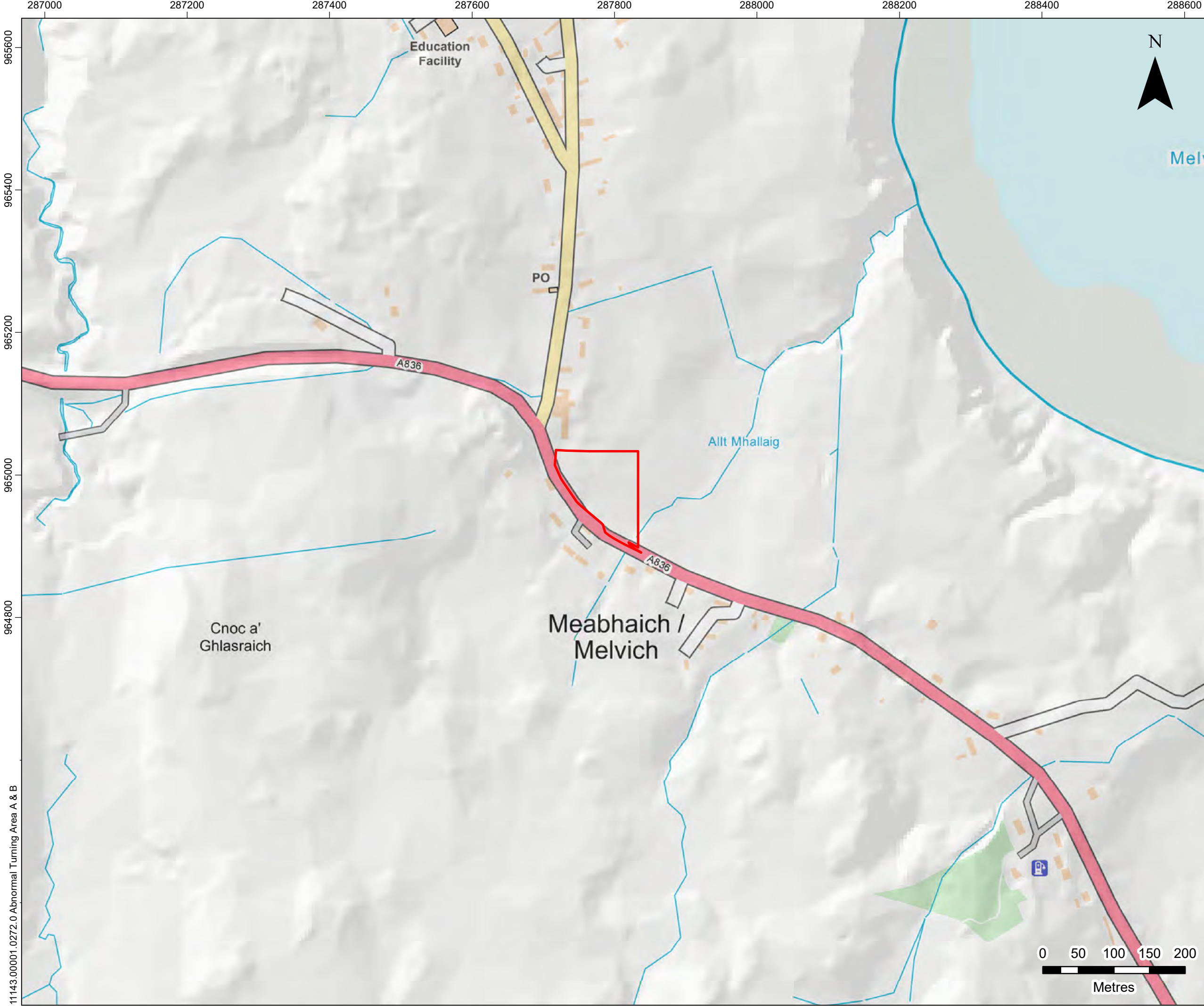
APPLICATION BOUNDARY

FIGURE 3

Scale 1:25,000 @ A3

Date NOVEMBER 2022

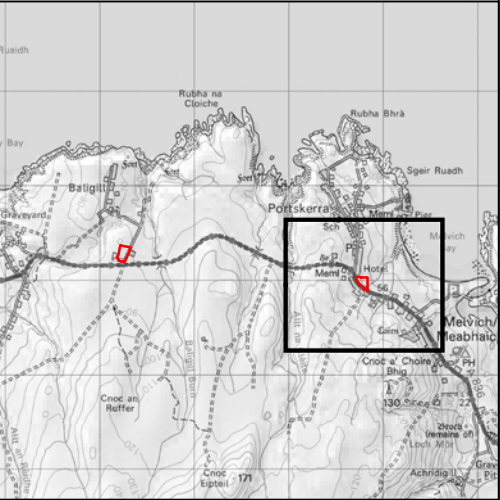




11143.00001.0272.0 Abnormal Turning Area A & B

LEGEND

Application Boundary - Abnormal Load Turning Area (A836)



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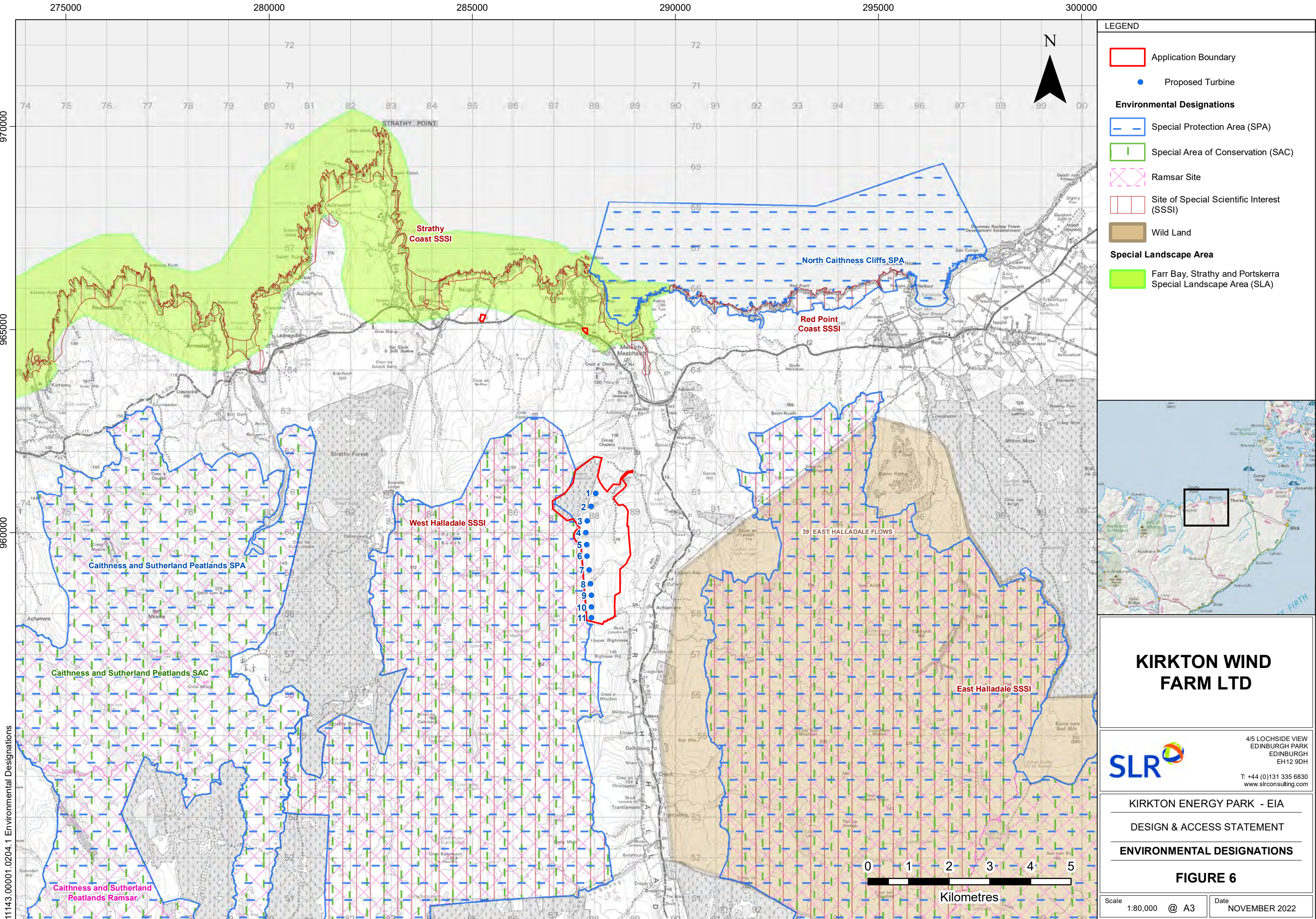
ABNORMAL LOAD TURNING AREAS
TURNING AREA B

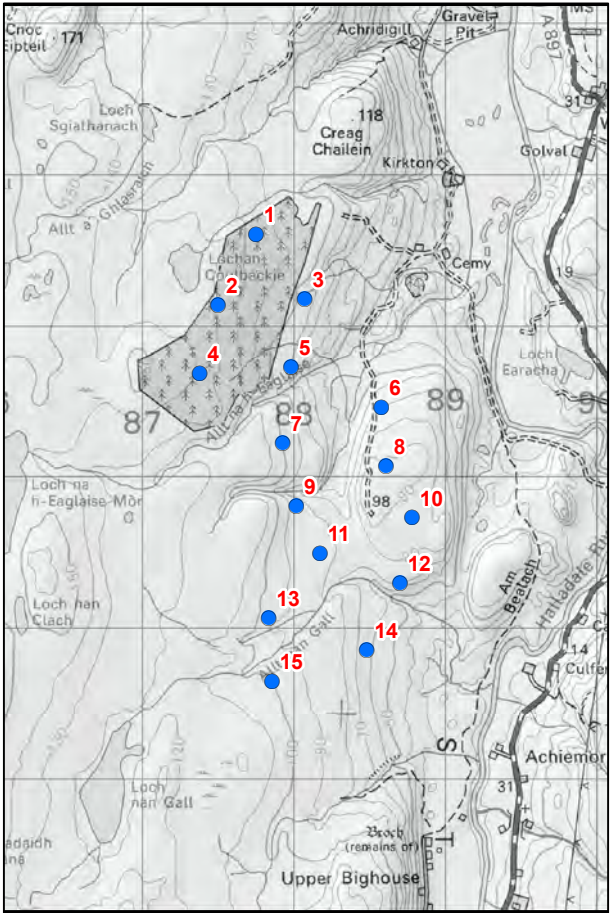
FIGURE 5

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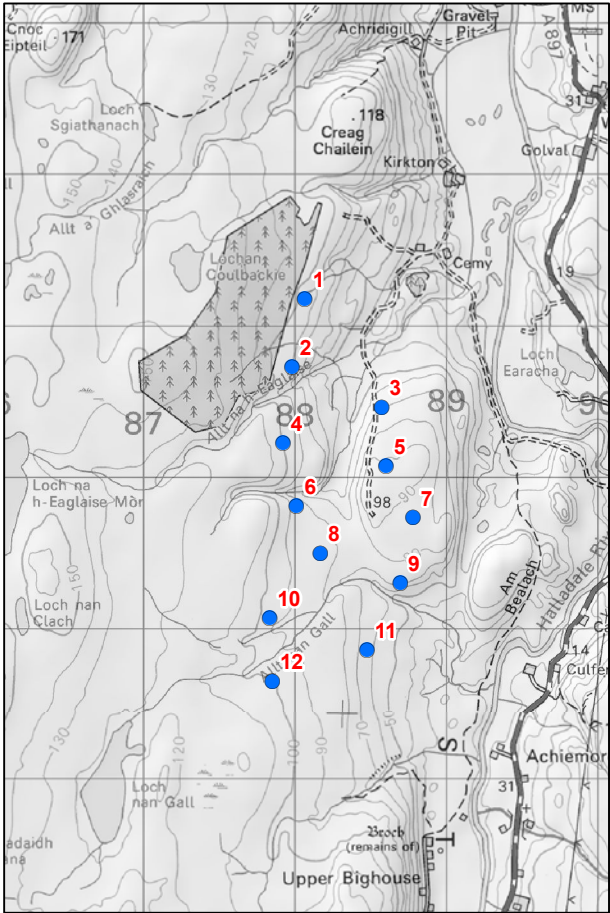
Date
NOVEMBER 2022



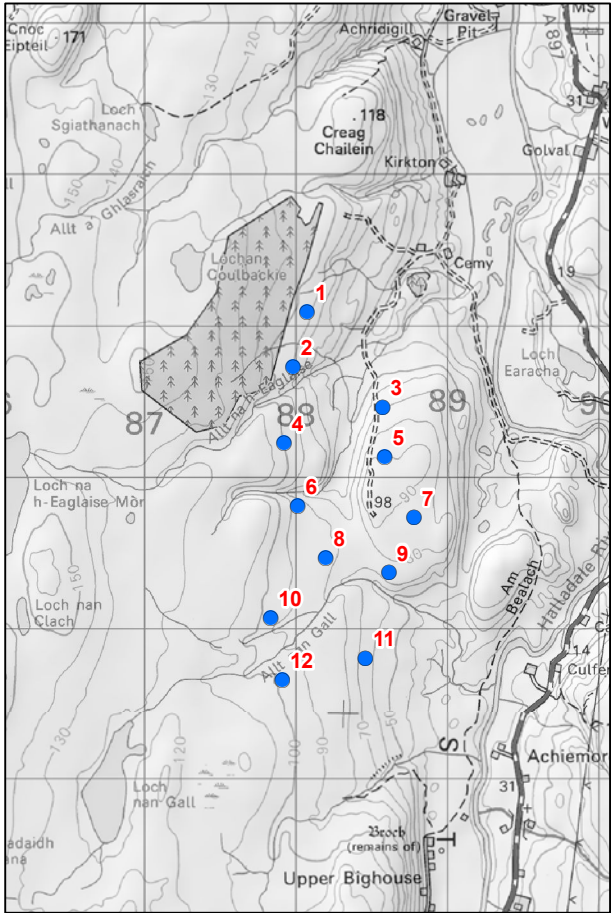




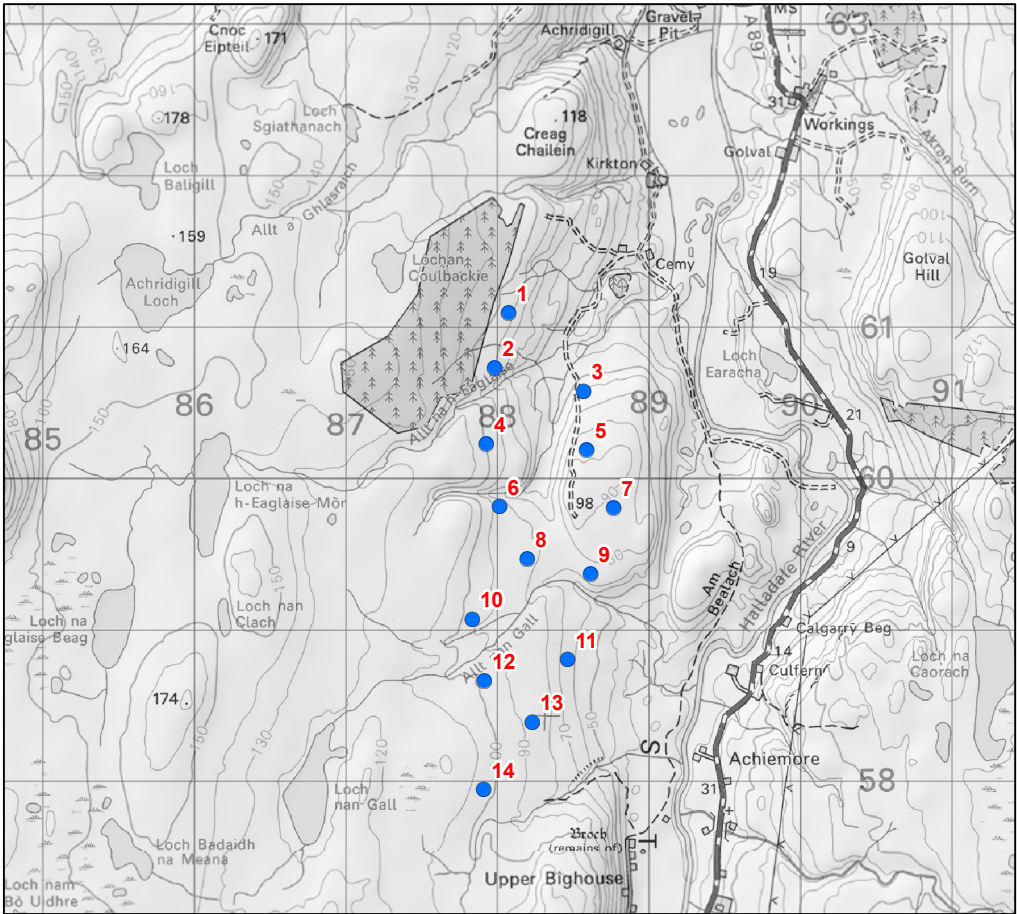
LAYOUT A: INITIAL MAXIMUM SITE LAYOUT



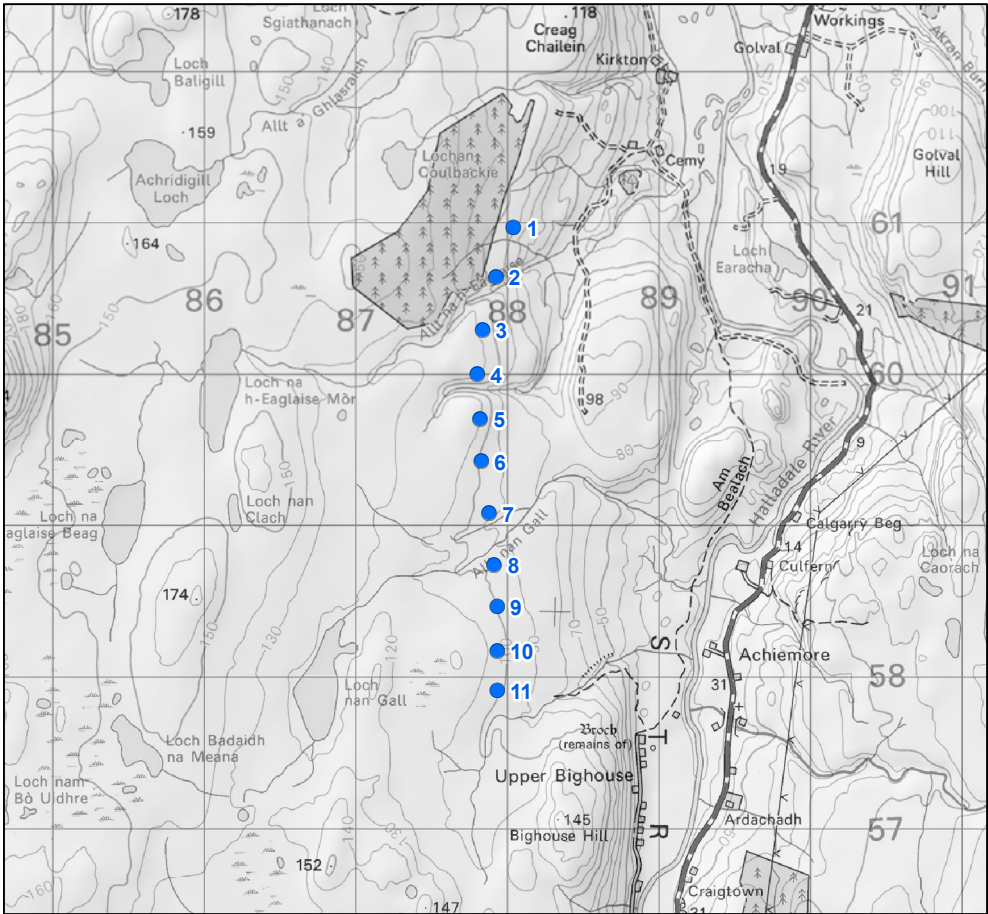
LAYOUT B: PRE-APPLICATION ADVICE LAYOUT



LAYOUT C: SCOPING LAYOUT



LAYOUT D: SCOPING ADDENDUM LAYOUT



LAYOUT E: DESIGN FREEZE LAYOUT

- LEGEND
- Proposed Turbine
 - Initial Turbine Number
 - Final Turbine Number

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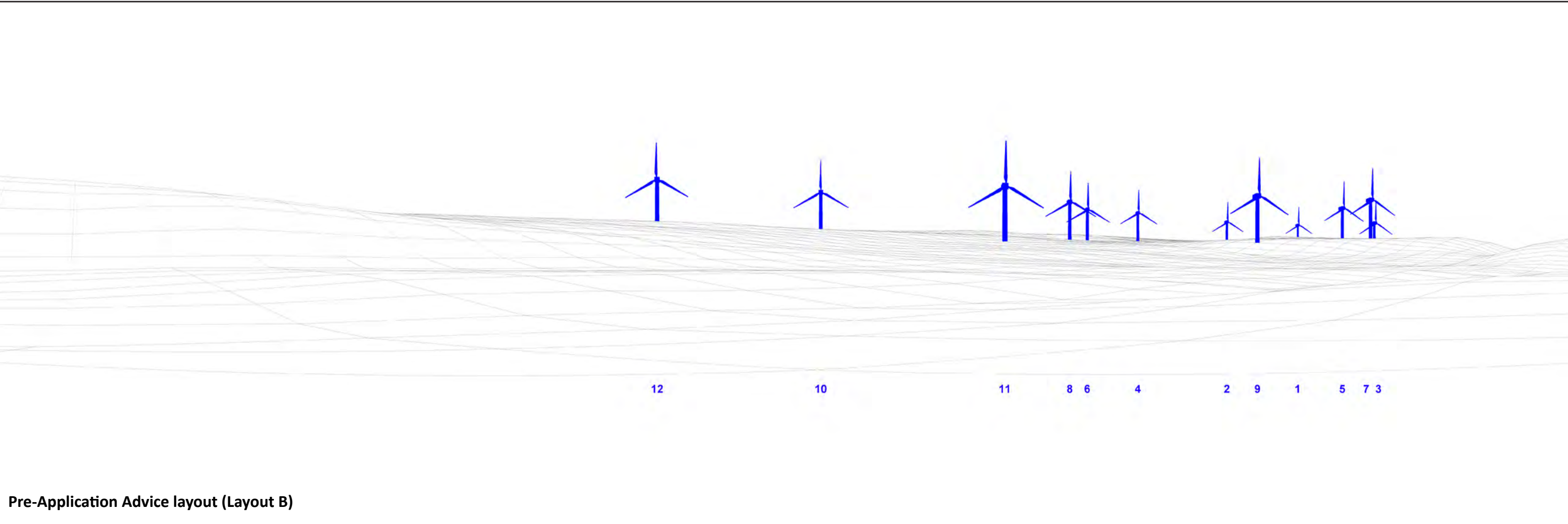
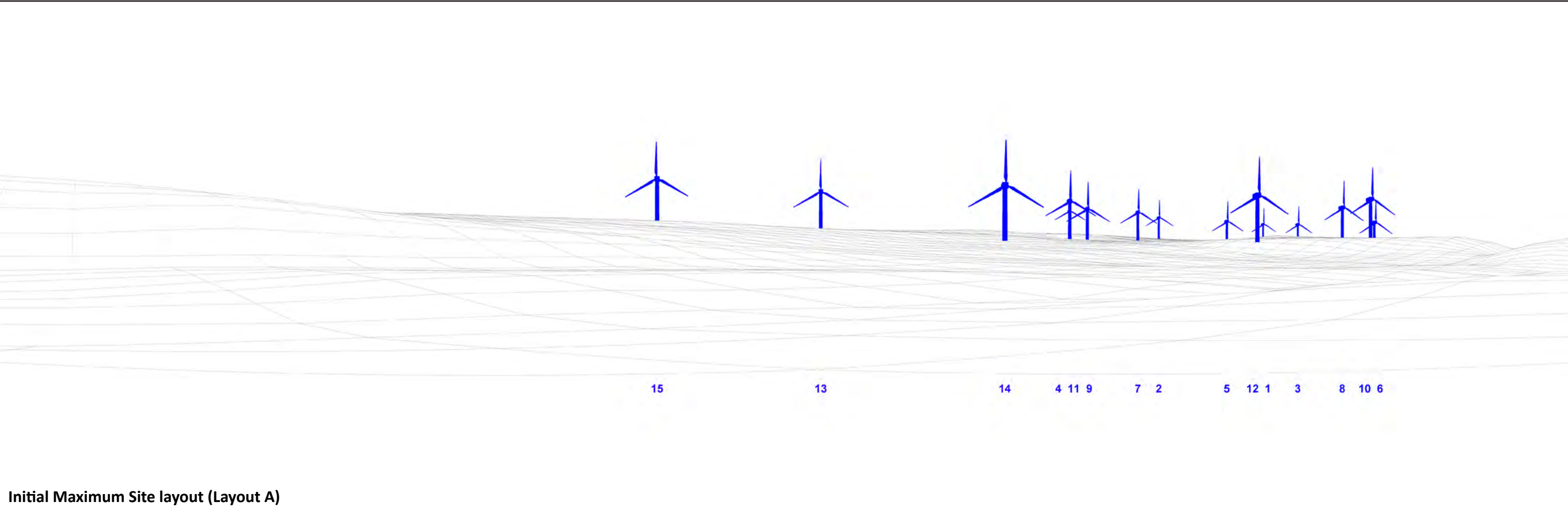
DESIGN & ACCESS STATEMENT

DESIGN EVOLUTION

FIGURE 7

Scale
1: 50,000 @A3

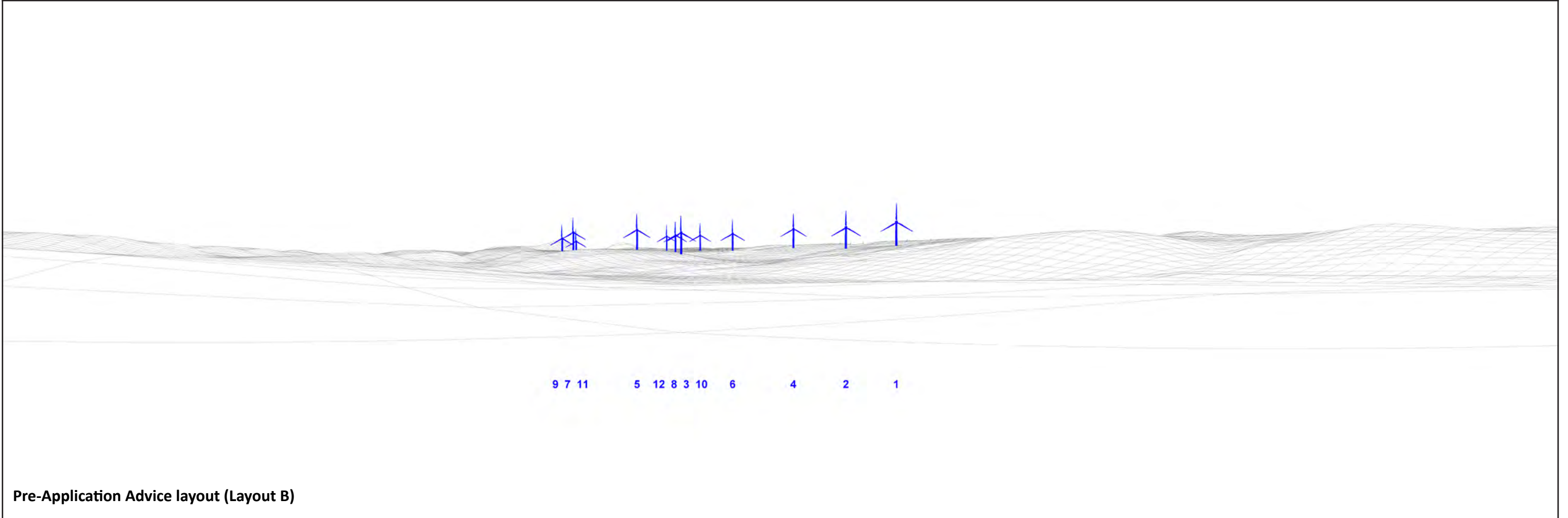
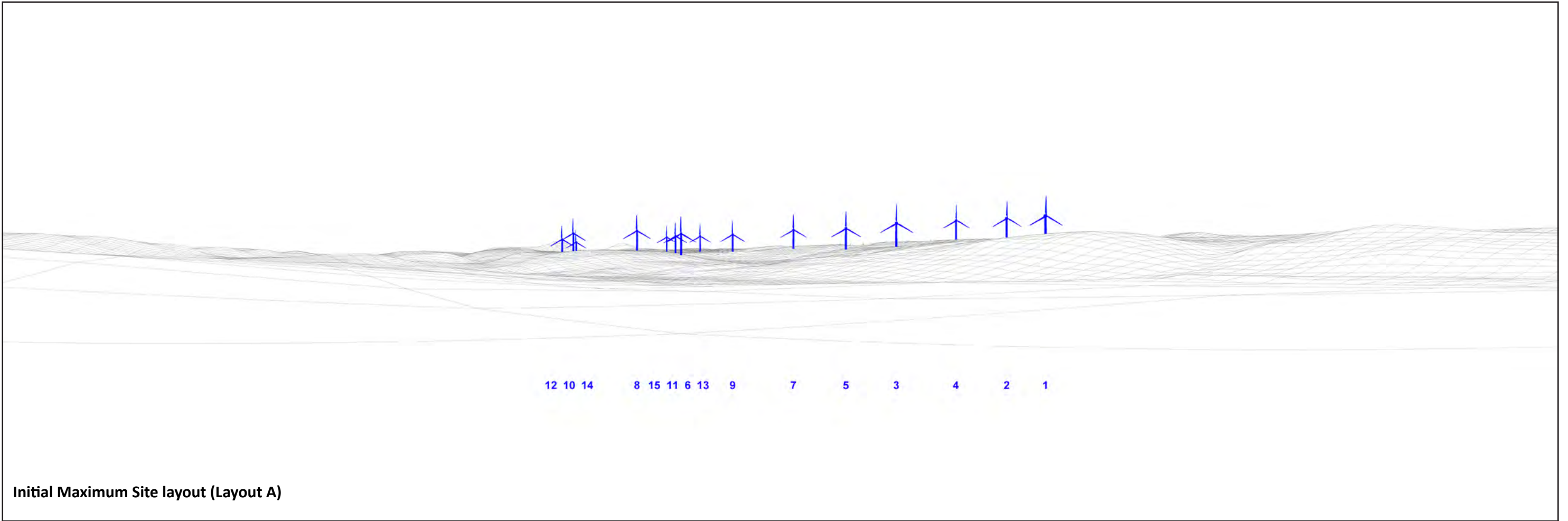
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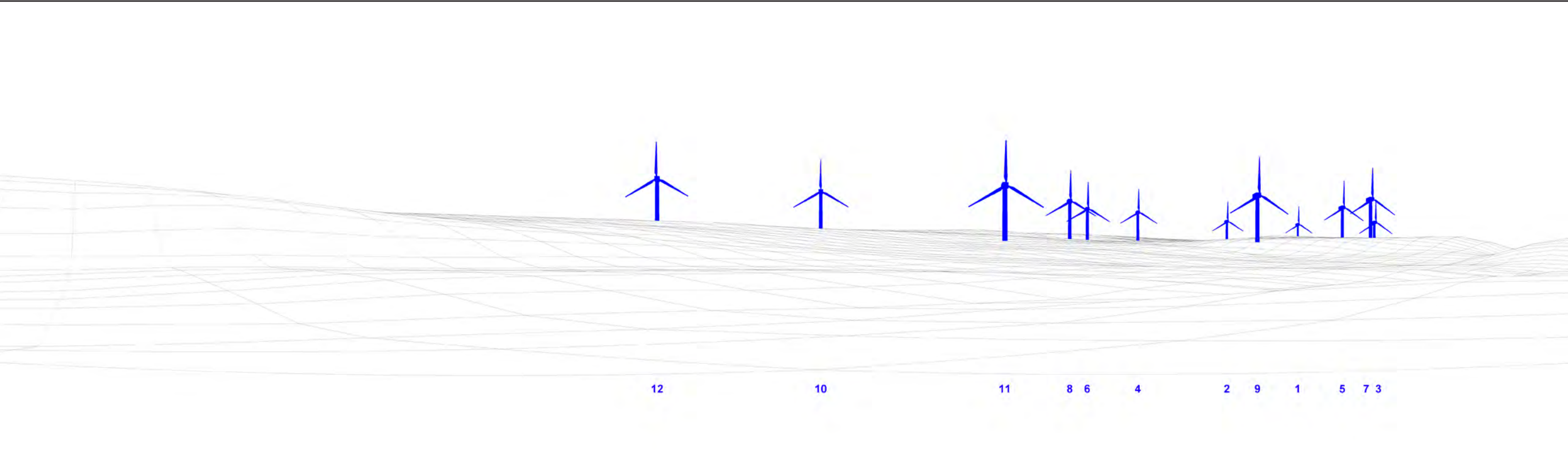


Horizontal Field of View: 90° Camera Height: 2m

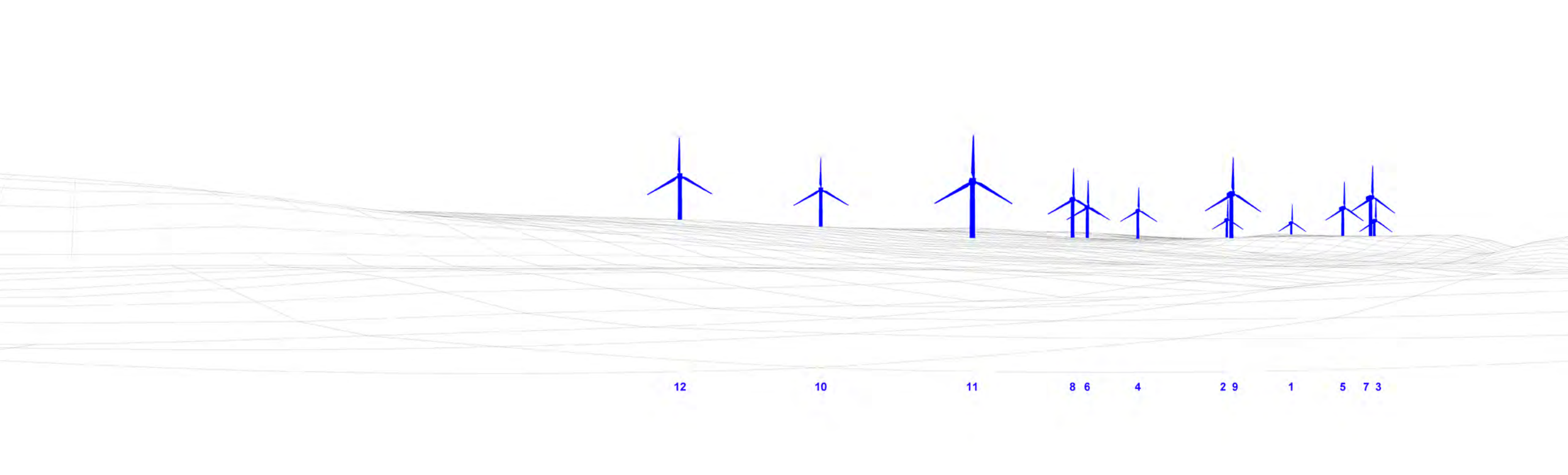
Wireline

Kirkton Energy Park **Figure 8a**
Viewpoint 1: A897 Strath Halladale





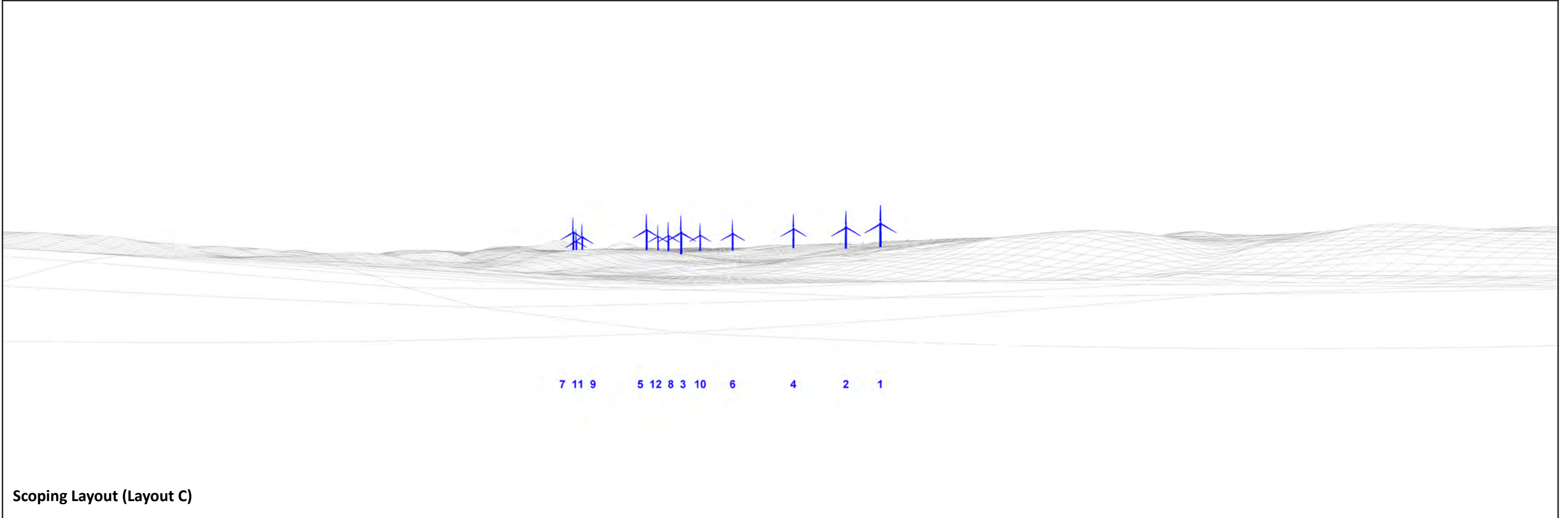
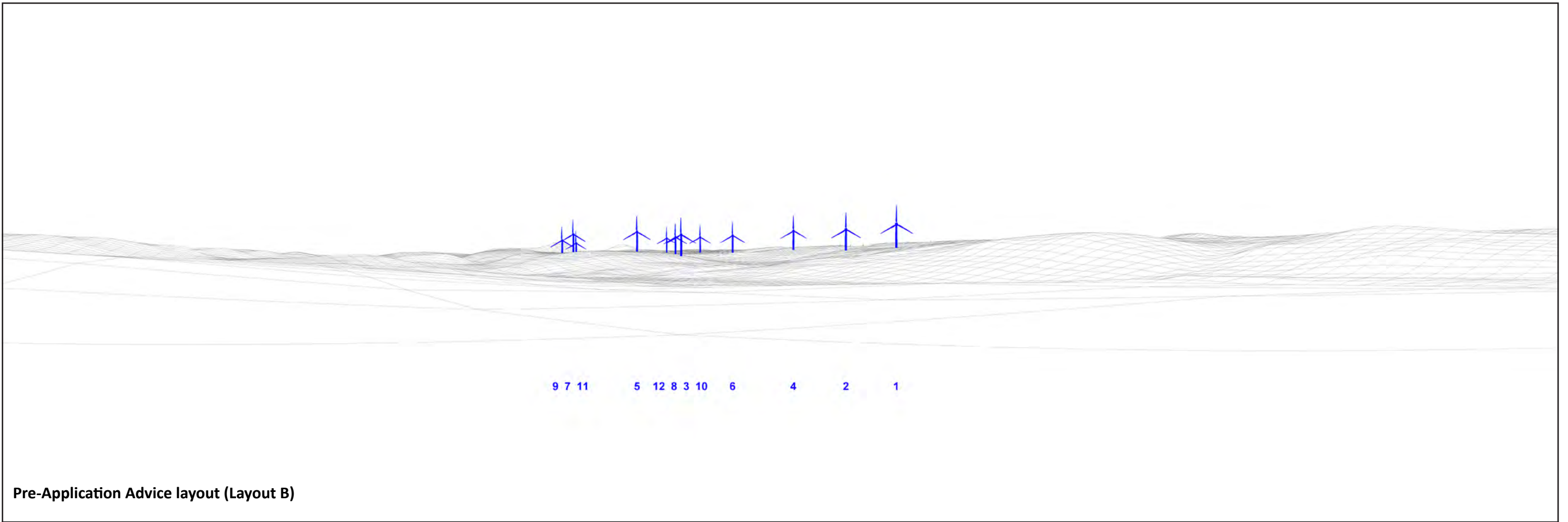
Pre-Application Advice layout (Layout B)

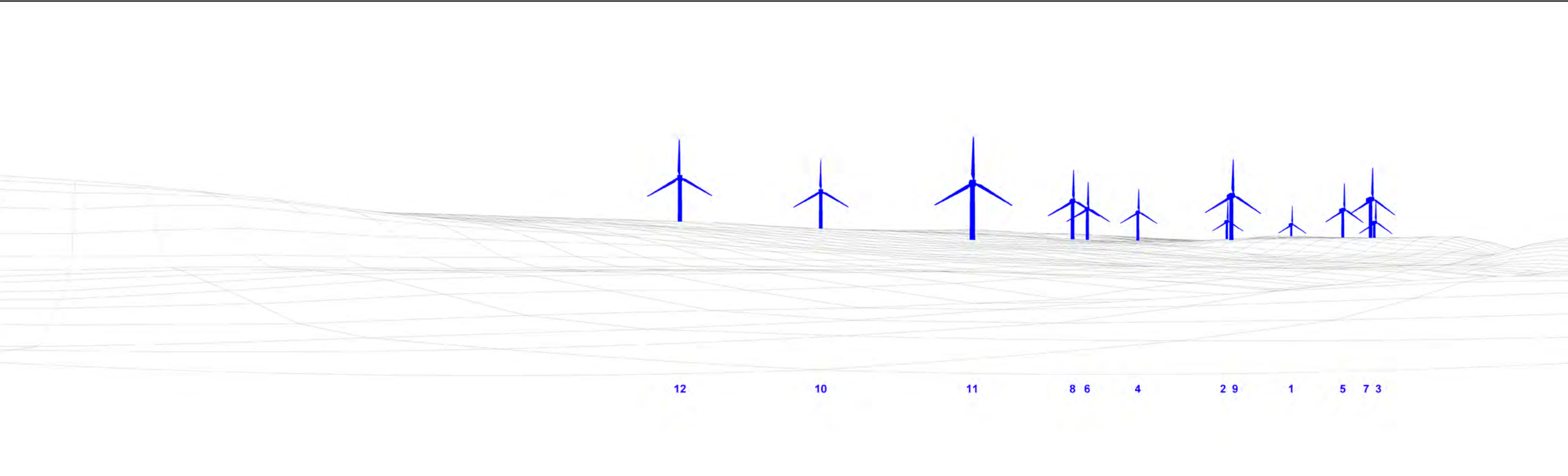


Scoping Layout (Layout C)

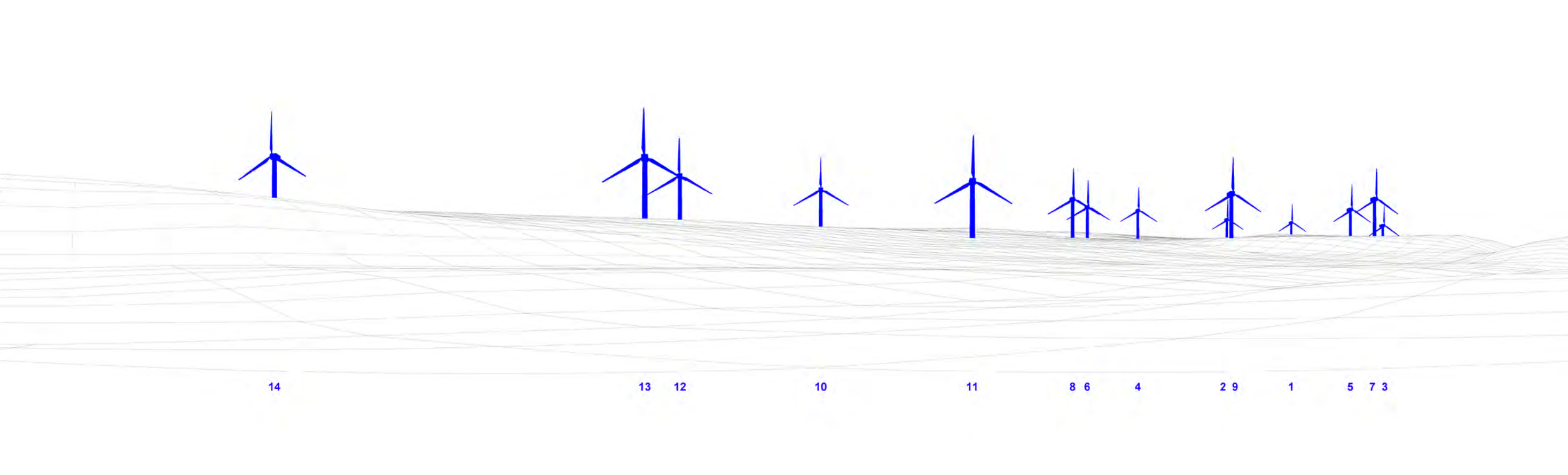
Horizontal Field of View: 90° Camera Height: 2m

Wireline





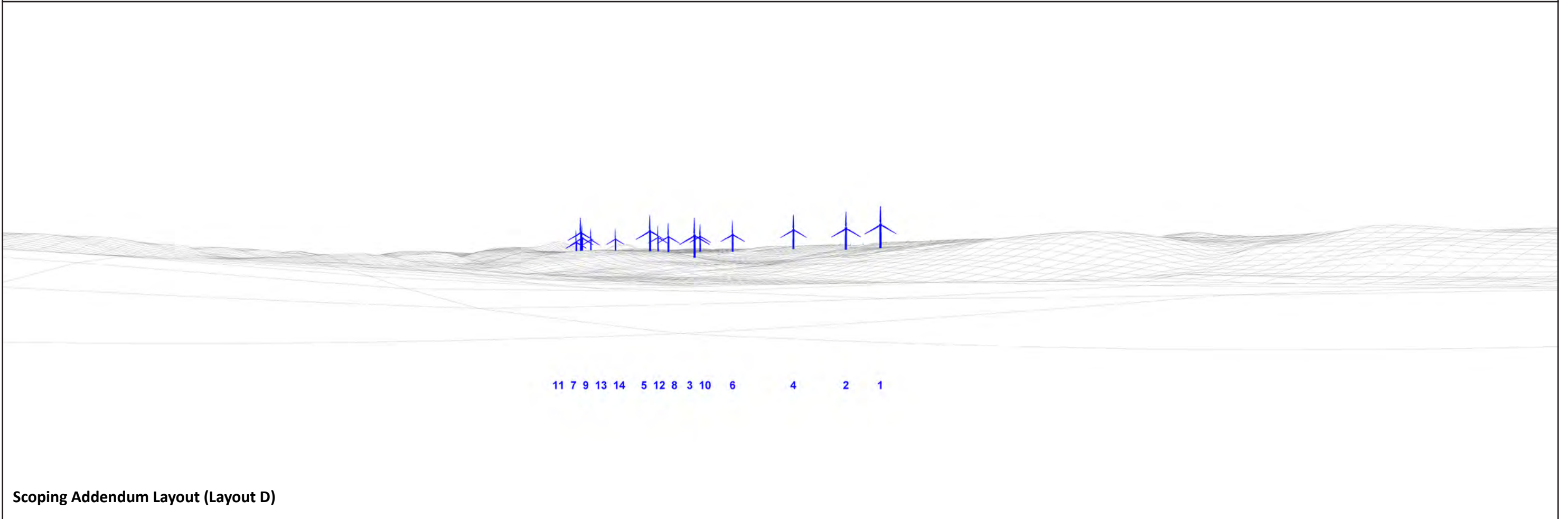
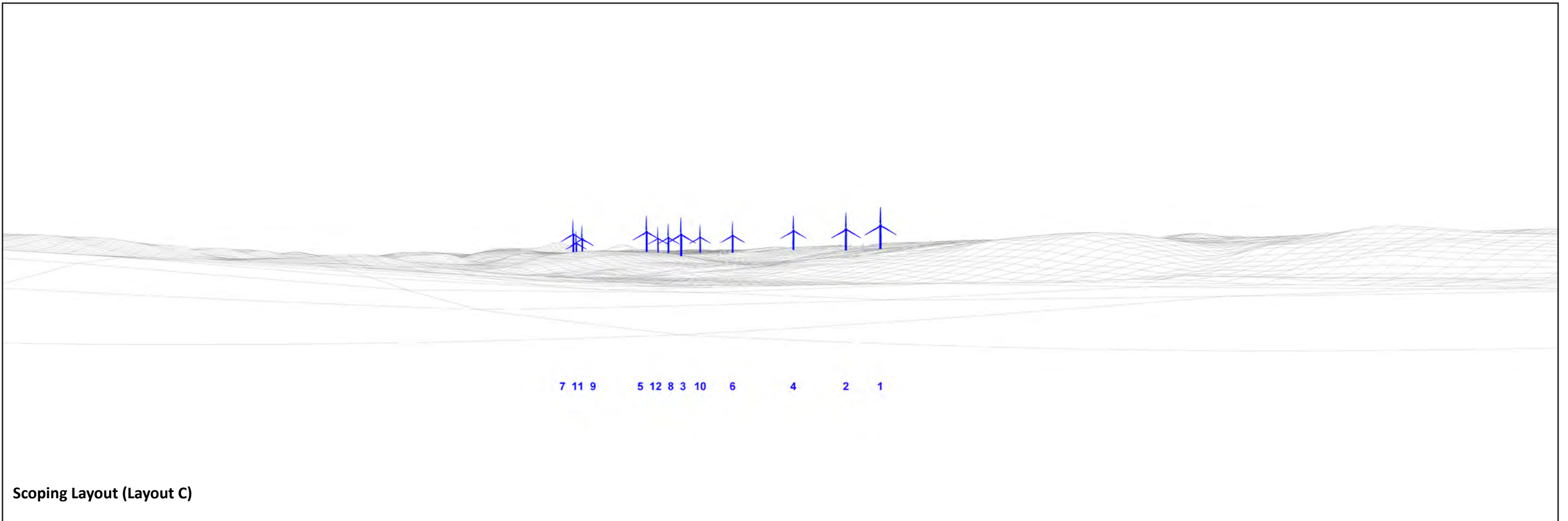
Scoping Layout (Layout C)

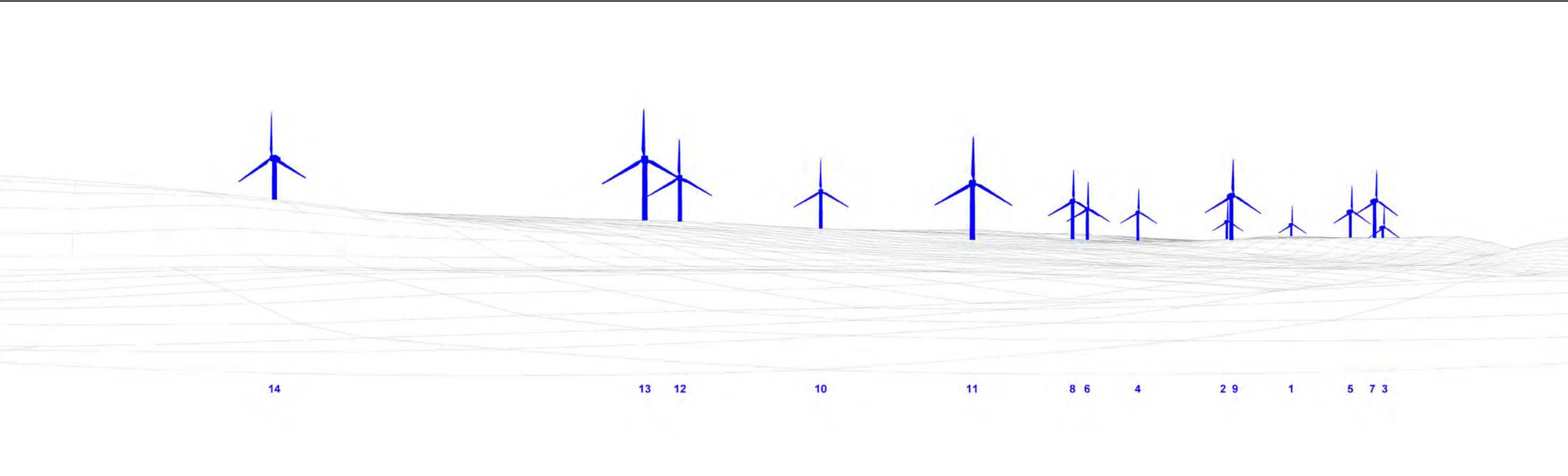


Scoping Addendum Layout (Layout D)

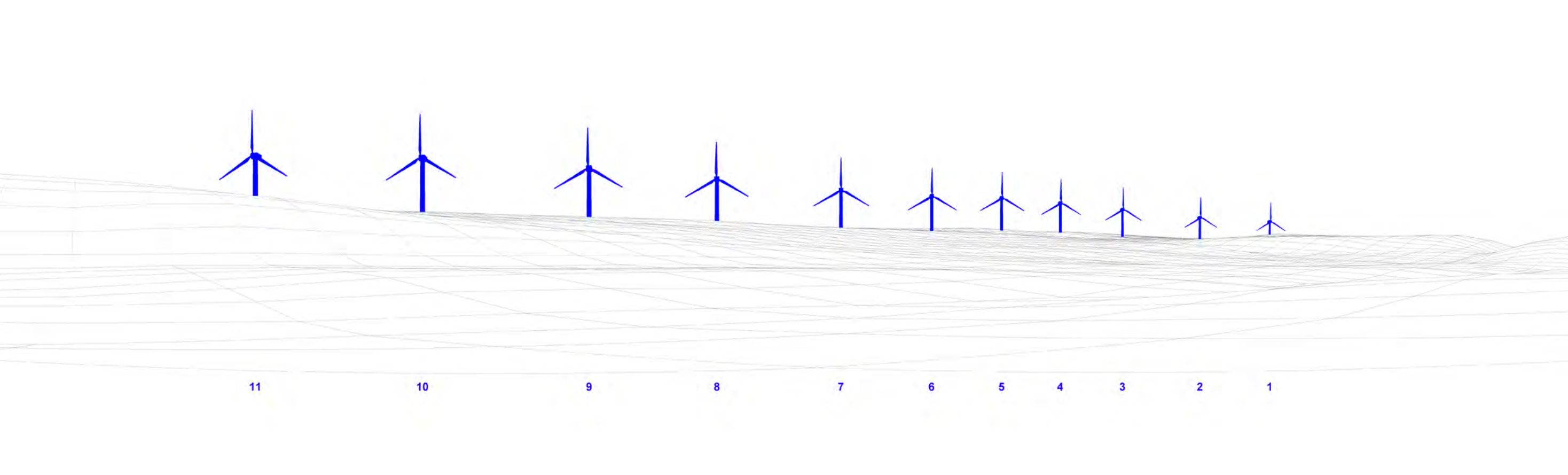
Horizontal Field of View: 90° Camera Height: 2m

Wireline





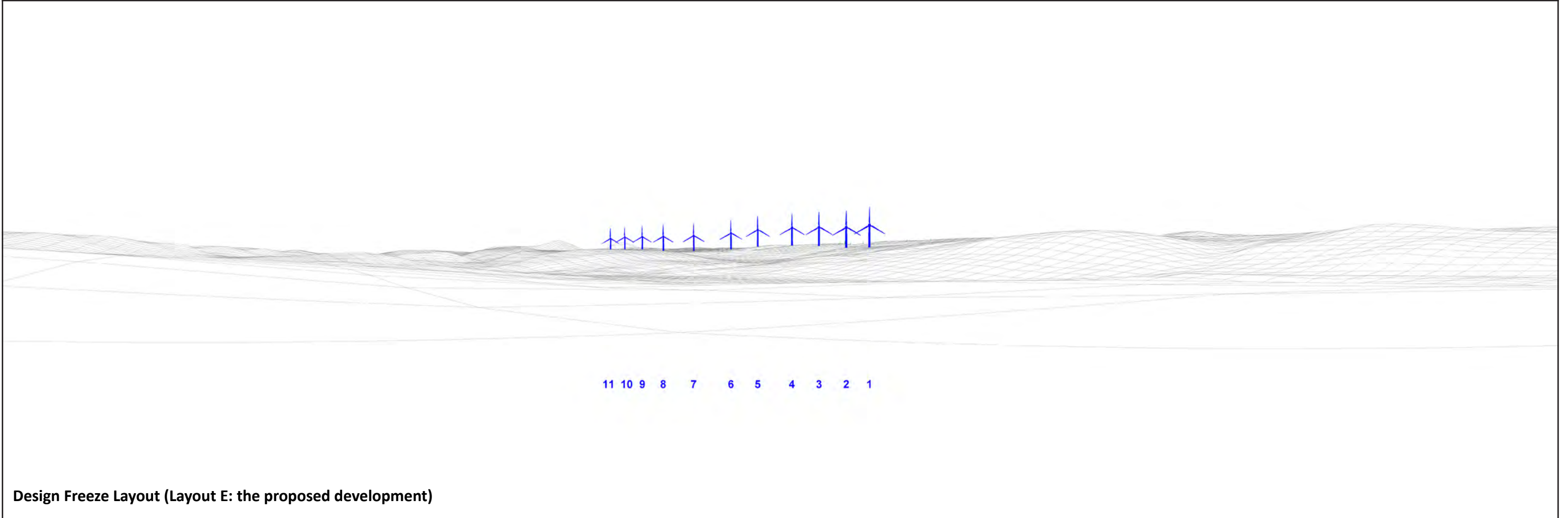
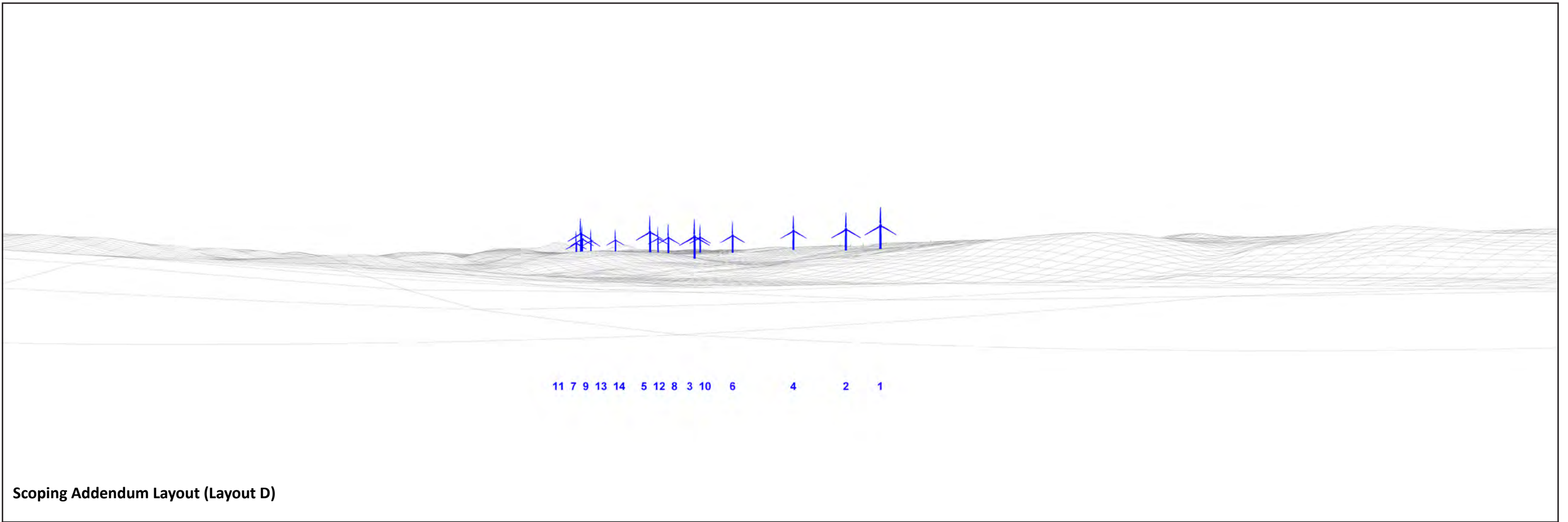
Scoping Addendum Layout (Layout D)



Design Freeze Layout (Layout E: the proposed development)

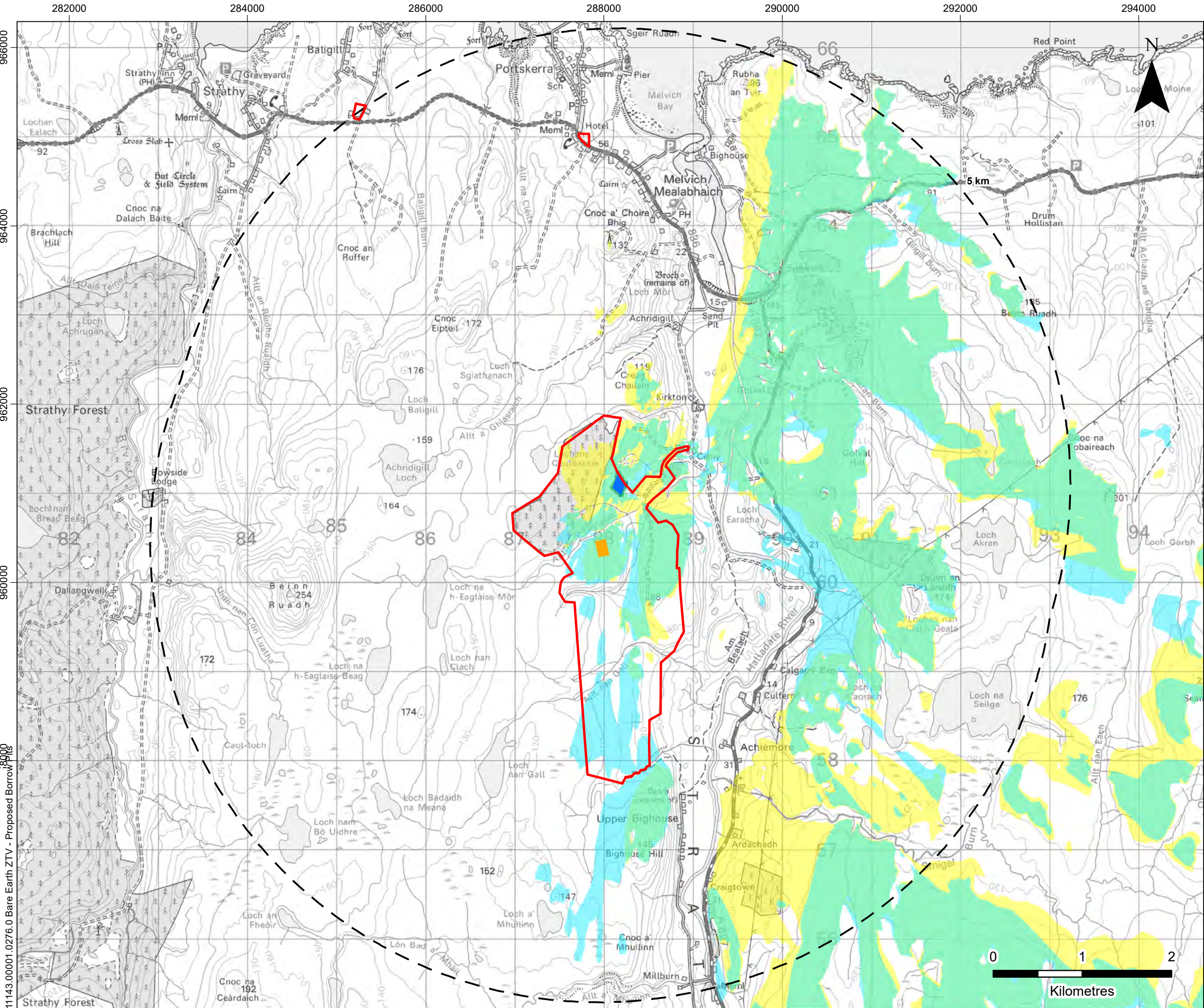
Horizontal Field of View: 90° Camera Height: 2m

Wireline



Horizontal Field of View: 90° Camera Height: 2m

Wireline



LEGEND

Application Boundary

Borrow Pit 1

Borrow Pit 2

Borrow Pits 5 km Buffer

Zone of Theoretical Visibility (Bare Earth):
Borrow Pit 1 Visible (blue), Borrow Pit 2 Visible (yellow), Both Visible (green)

Note

This Zone of Theoretical Visibility (ZTV) has been generated using ESRI ArcGIS Spatial Analyst extension. The digital terrain model (DTM) has been derived from OS Terrain 5 dataset (1.5 - 2.5m Root Mean Square Error [RMSE]) up to 15km from Borrow Pits locations. Earth curvature has been included in the ZTV calculation and refraction of light has been applied using SNH guidance settings. The ZTV has been generated from a viewing height of 2m above ground level which falls within recommendations by "Visual Representation of Windfarms" prepared for Scottish Natural Heritage (SNH) February 2017 - Version 2.2.

The use of ZTV mapping at this stage is limited and the following assumptions should be noted:

- The ZTV has been generated using grid points positioned across the area of the proposed Borrow Pits locations for Kirkton Energy Park.
- The proposed Borrow Pits heights of 0m (ground level) have been used for generating the ZTV.
- The ZTV is generated from a bare earth terrain and does not account for the screening effect of features within the landscape such as settlements and woodland. It does not indicate potential visual effects or show the likely significance of effects. It shows potential theoretical visibility only. The ZTV has been produced for the purpose of informing 'on the ground' visual assessment.
- The ZTV colour palette has been specifically developed to assist viewers with reduced sensitivity to red, green and blue light.

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DESIGN & ACCESS STATEMENT

**BARE EARTH ZTV:
PROPOSED BORROW PITS**

FIGURE 13

Scale1:40,000 @ A3

DateNOVEMBER 2022

