



Wicklow County Wind Energy Strategy



APPENDIX 1

COUNTY WICKLOW WIND ENERGY STRATEGY

1. Introduction

Wicklow County Council recognises the need to reduce dependence on fossil fuels for energy generation and supports the development of renewable resources. As set out in Chapter 14 of this plan, the most readily available and easy to exploit renewable resource is wind. However, as there is a strong correlation between areas with the highest wind resource and sensitive coastal and upland landscapes, a strategy is required which allows the Council to positively control the development of windfarms, whilst protecting environmental and material assets.

2. Developing the strategy

The Wicklow Wind Energy Strategy has been developed generally in accordance with the DoEHLG guidelines and the following methodology has been employed:

Step 1 Identify locations that should not be considered for wind energy development, by virtue of a special conservation designation or other factors considered to render the location unsuitable

Step 2 Identify locations where low wind speed would not render exploitation viable

Step 3 Evaluate the residual areas against the following criteria:

- a. Visual and landscape sensitivity;
- b. Impact on material assets;
- c. Land cover issues;
- d. Grid connection issues.

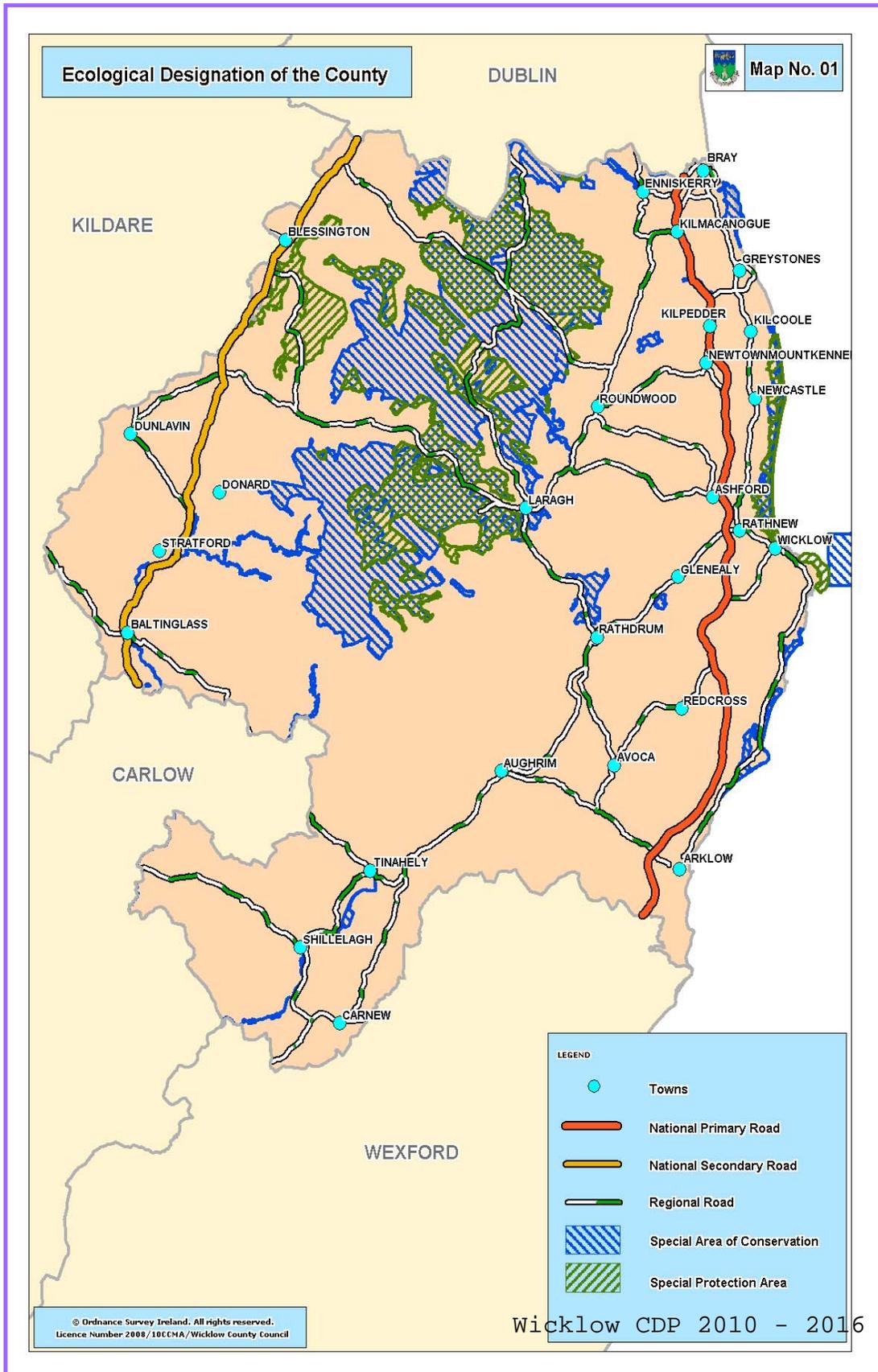
Step 4 Set out the Strategy

Step 1

As set out in the Wind Energy Development Guidelines, the designation of an area for protection of natural or built heritage or as an amenity area does not automatically preclude wind energy development. However, consideration of any wind energy development in or near these areas must be subject to Ireland's obligations under the Habitats Directive (92/43/EEC), the EU (Birds) Directive (79/409/EEC) and the Environmental Impact Assessment Directive (85/337/EEC). In this regard, this strategy has considered the characteristics of the County's SACs and SPAs (now known as Natura 2000 sites) and NHAs, in terms of:

- the type of protection afforded to the site (e.g. European, national or regional designation), which gives an indication of the overall importance of the site;
- the flora, fauna or intrinsic features for which it is designated;
- their conservation objectives;
- their vulnerability;
- the contribution to the overall landscape and environment, in terms of views/prospects and tourism / recreation potential

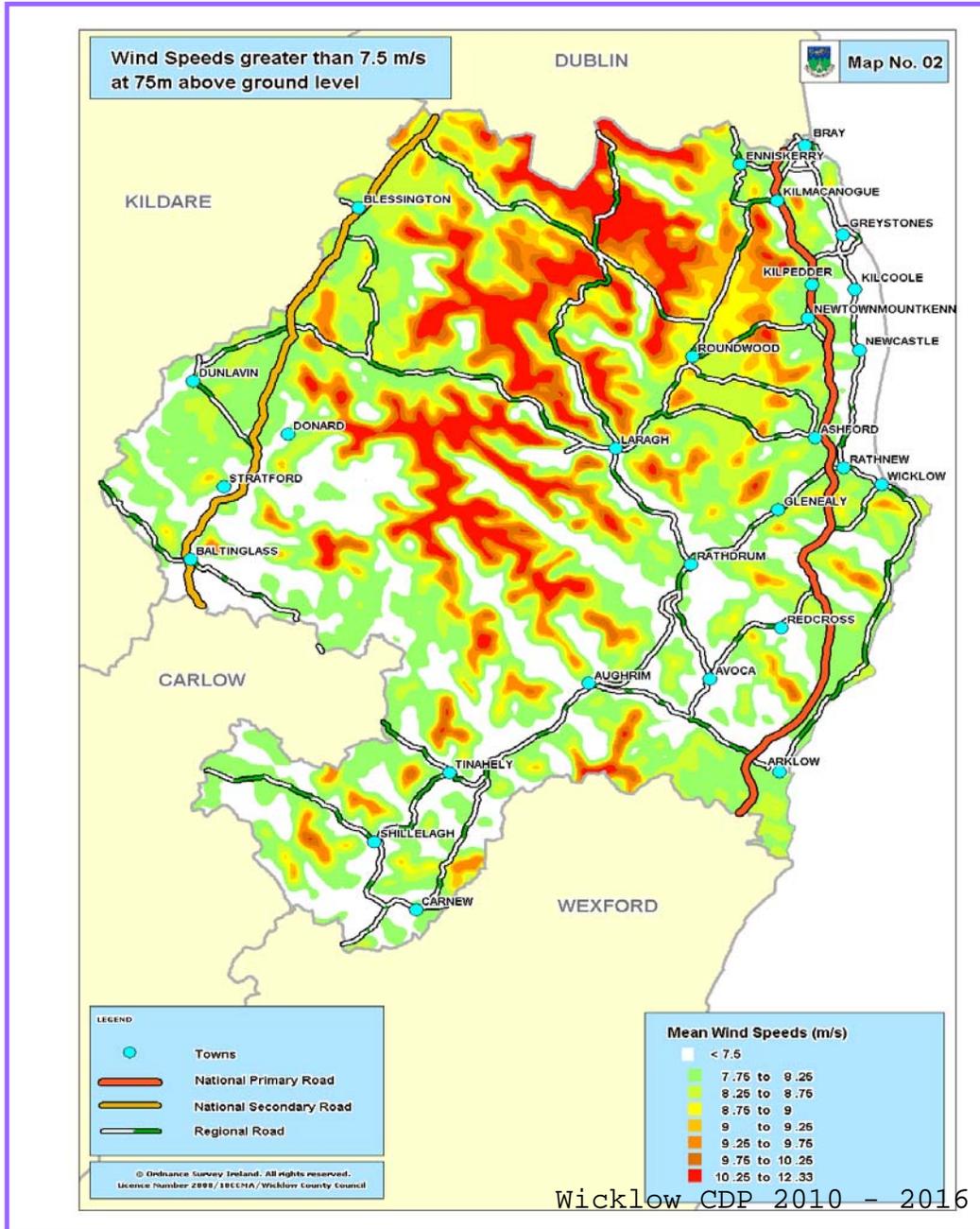
Having considered these factors and the provisions of the EU Habitats Directive (which stipulate that plans or projects likely to have an adverse effect on the integrity of a site of international importance for nature conservation (e.g. an SAC or SPA) may only be permitted where there is no alternative solution and where there are imperative reasons of overriding public interest), all lands designated SAC or SPA are deemed unsuitable for wind farm development, as shown on Map 1 to follow:



Step 2

Utilising Sustainable Energy Ireland’s *Wind Atlas for Ireland*, wind speeds for the County have been determined.

Electricity output is proportional to the wind speed cubed, therefore a small difference in the average wind speed has a big effect on electrical output. A wind turbine located on a site which has an annual wind speed of 6.2 m/s (metres per second) will produce less than half as much energy as the same turbine on a site where the annual wind speed is 8m/s. Sites with a mean wind speed above 7.5m/s are favourable. The viability of a wind farm depends on the costs necessary to generate electricity and wind speed is a critical factor in this regard. For the purpose of this strategy, wind speeds greater than 7.5m/s at a contour height of 75m were taken as viable exploitable wind speeds¹. Map 2 below is the ‘wind map’ of County Wicklow:



¹ It is acknowledged that technology is likely to improve over the course of this strategy and therefore this strategy will not preclude development in any area solely because of its wind speed

Step 3 Evaluation of Areas of Wind Energy Potential

Following Steps 1 and 2, it is possible to derive a residual map, showing the locations where there are no designations that would preclude wind farm development and where wind speeds would make exploitation viable.

As these areas will not be uniform in their characteristics, the next step was to break these areas up into 'cells' with similar characteristics and to evaluate each cell.

These areas were evaluated on the following grounds:-

1. Landscape and visual sensitivity
2. Impact on material assets
3. Land cover issues
4. Grid connection issues

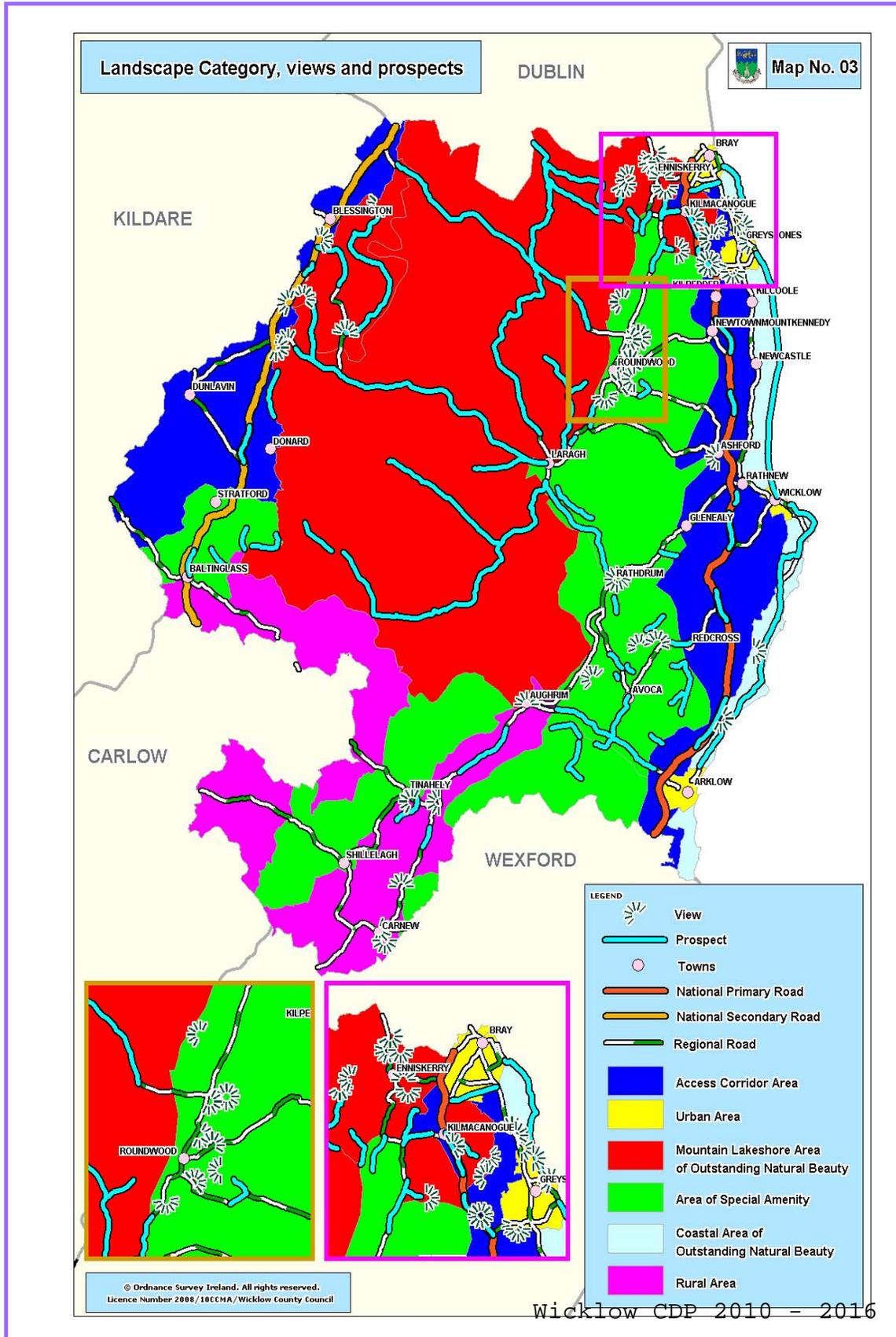
Landscape and visual sensitivity

This topic has two separate but closely related aspects. The first aspect to be considered is visual impacts, focusing on the extent to which new developments can be seen; the second aspect is the perceived impact on the character of the landscape and examining responses, which are felt towards the combined effects of the new development. This latter topic is complex because it encompasses many other impacts such as noise, odours, ecology, history and because attempts to scientifically measure feelings and perceptions are not reliable.

In evaluating each cell, consideration was given to

- landscape classification as per the Wicklow County Development Plan;
- designated tourism routes and listed views and prospects;
- residences, tourism facilities and amenities;
- sites and monuments of archaeological, architectural or historical interest;
- the sensitivity and vulnerability of the area to landscape or visual change.

Map 3 to follow outlines the landscape categories of the County, in addition to listed views and prospects, which it is an objective of the plan to protect from inappropriate development. The fact that any area is located in a particular landscape zone or is subject to views or prospects would not in itself render the area unsuitable to wind farms. However, where an area is particularly sensitive and vulnerable in these regards, it must be considered less favourable to exploitation, and more difficult to develop given the constraints that would be faced in the siting and design of any development.



Impact on material assets

Material assets are resources that are valued and intrinsic to specific places, they may be of either human or natural origin and the value may arise for either economic or cultural reasons. The assessment objectives vary considerably according to the type of assets, those for economic assets being concerned primarily with ensuring equitable and sustainable use of resources. Assessments of cultural assets are more typically concerned with securing the integrity and continuity of both the asset and its necessary context.

Economic assets of natural value include assimilative capacity of air and water; non-renewable resources (e.g. minerals, soils); renewable resources (hydraulic head, wind exposure); deep-water berthage.

Economic assets of human origin include cities, towns, villages and settlements; transportation infrastructure (roads, railways, airports etc); major utilities (water supplies, sewage, power systems etc); ownership and access.

Cultural assets of a physical type include archaeology in context; architecture in context; settlements; monuments, features and landmarks; historic sites and structures; geological heritage.

Cultural assets of a social type include language and dialects; folklore and tradition; religion and belief; literary and artistic association.

In these regards, the following were considered in each cell

- the location and scale of human settlement in that area;
- the density of items and places of heritage value, in particular protected archaeological and architectural features;
- infrastructural assets, which it is an objective of the plan to protect.

Land Cover issues

Certain locations may not be suitable for wind farm development due to existing land cover or land uses. An obvious example would be the unsuitability of lands in towns or village centres. The land cover / use types taken as being unsuitable for the purpose of this study are

- bog lands, due to the danger of land slides;
- lands within 600m of the historic core of a settlement or a residential zone within a settlement;
- lands within 100m of the N11 / N81, in order to avoid driver distraction;
- lands within 1km of licensed airfields;
- lands within 100m of high voltage cables.

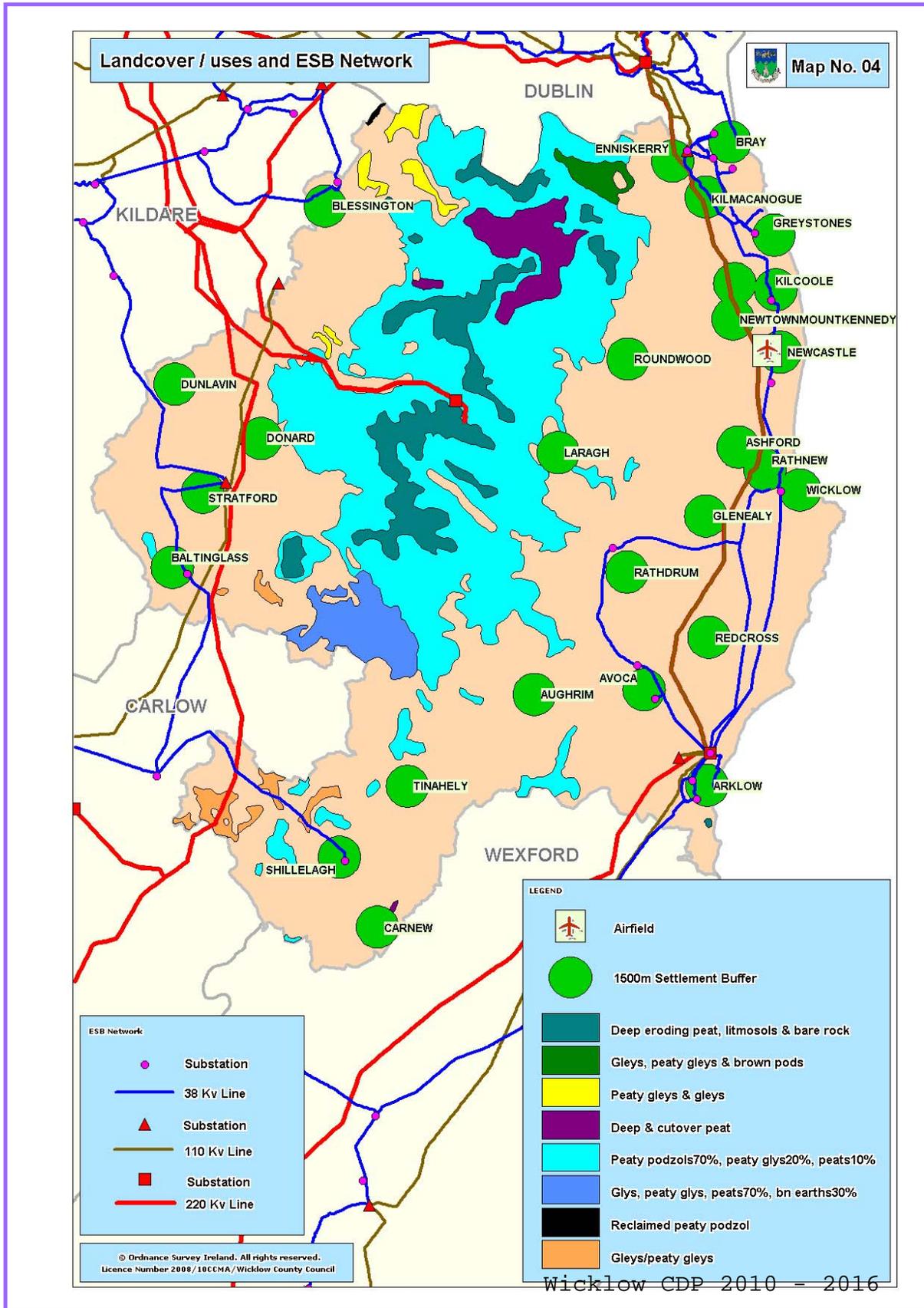
While forested lands are not included in this list, newly felled forestry land may present challenges with regard to soil condition, land stability and drainage. Similarly, while tourism uses and wind energy can happily co-exist, the effect of wind energy development on tourism and recreational activities must be assessed. Wind energy developments are not incompatible with tourism and leisure interests, but care needs to be taken to ensure that insensitively sited wind energy developments do not impact negatively on tourism potential.

Grid issues

While new electrical transmission lines can be built to virtually any location, the benefit of connecting a given site / location to the grid must be weighed up against the cost of such connections. The cost is not only financial (which may impact on the viability of the site) but also environmental, with new overhead power lines potentially disturbing habitats or migratory patterns.

In this regard, locations in excess of 10km from either the 110kV/220kV transmission lines or suitably sized substations are less likely to be economically viable.

Map 4 to follow indicates land covers / uses and the electricity transmission network in County Wicklow.



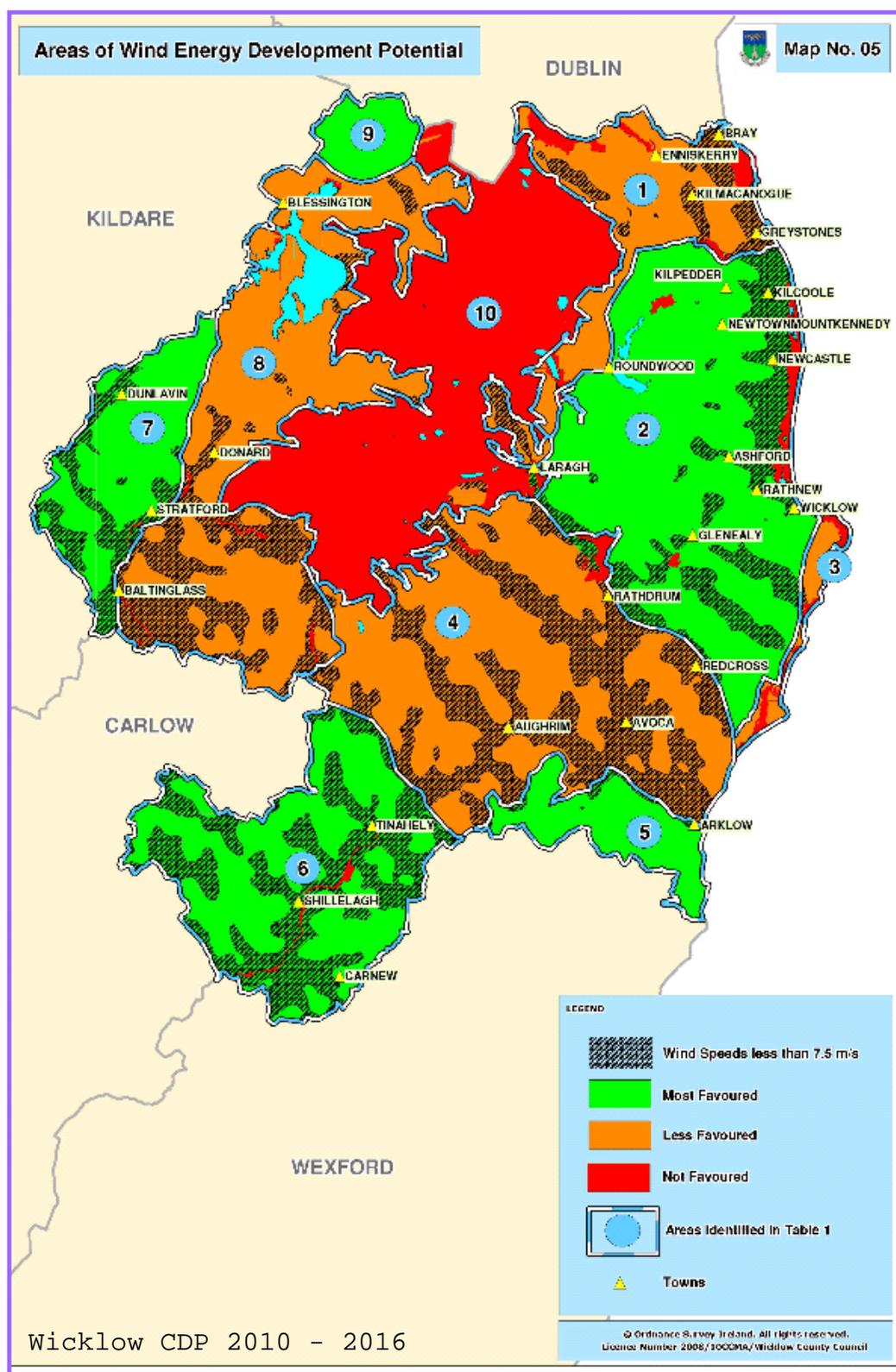
Step 4 Results of assessment – County Wind Strategy (as outlined in Table 1 below)

Each cell has been assessed as set out above and the results are shown in the table and on map 5 to follow. The County has been divided into three zones:-

- Red** Wind farm development will not be considered favourably in these areas
Not Favoured
- Green** Wind farm development will be considered favourably, subject to compliance with all necessary siting and design standards
Most Favoured
- Orange** Wind farm development will be considered, but the sensitivities revealed in these areas would render exploitation more problematic and therefore these areas are less favoured for wind development
Less favoured

Table 1:

No	Considerations	Decision
1	Having regard to the high level of settlement this area (both in towns and in their rural hinterlands), the proximity to areas of high amenity which includes the Great and Little Sugar Loafs and Bray Head, the close proximity to SACs, SPAs and the Wicklow Mountains, the number of views / prospects and sites of architectural and archaeological value in this area, is it considered that development of wind farms in this cell would be particularly challenging	Less favoured
2	Having regard to the dispersed nature of settlement outside of the towns, reasonable access to the grid and the limited number of views / prospects in the rural area, it is considered that this area is suitable for wind energy development. Applications in proximity to the SACs (Vale of Clara, Carrigower Bog, and Deputy's Pass) will be required to include clear mitigation measures so as to eliminate or reduce the impact on these sites.	Most favoured
3	Having regard to the proximity to areas of high amenity value, the existence of views / prospects along the coastline and the proximity of SACs (Buckroney-Brittis Dunes Fen and Magherabeg Dunes), this area is not considered generally suitable for wind energy development; however there may be localised pockets that can be exploited.	Less favoured
4	While this cell is characterised by dispersed settlement outside of the towns and has reasonable access to the grid, this is a scenic area, partially designated an Area of Outstanding Natural Beauty and is subject to numerous views / prospects. The tourist destinations of Avoca and Aughrim are also in this cell. However, there are areas with good wind resources, particularly south of Aughrim and around Redcross, that may be suitable, with fewer visual and landscape sensitivities.	Less favoured
5	Having regard to the sparse settlement pattern, to good access to the grid and the limited number of views / prospects in the area and taking into account the existence of an off-shore wind farm in visible proximity (which may alter the viewers 'expectations'), it is considered that this area is suitable for wind energy development.	Most favoured
6	Having regard to the small scale of the settlements in this area and dispersed nature of rural development, reasonable access to the grid and the existence of wind farms, this area is considered highly suitable for wind energy developments.	Most favoured
7	Having regard to good access to the grid, the sparse settlement pattern and the limited number of views / prospects, it is considered that this area is suitable for wind energy development.	Most favoured
8	Having regard to highly valued natural and built heritage in this cell, including the Pollaphuca Reservoir area and the Baltinglass Hills, the proximity to the Wicklow Mountains SAC and the number of views and prospects, is it considered that development of wind farms in this cell would be particularly challenging.	Less favoured
9	Having regard to good access to the grid, the sparse settlement pattern and the limited number of views / prospects, it is considered that this area is suitable for wind energy development.	Most favoured
10	Having regard to the high amenity and heritage value of this area, in terms of views / prospects, tourism / recreation and archeologically assets and given the EU protection afforded to the Wicklow Mountains SAC / SPA, this area is not considered suitable for wind farm developments.	Not favoured



Areas marked red – ‘Not Favoured’ outside of Cell 10 are designated **Natura 2000** sites (formerly SACs and SPAs) under the Habitats Directive. Proposed development at or in the vicinity of such locations shall address the impact of the proposed development on the Natura 2000 site and applicants will be required to demonstrate beyond all reasonable doubt that a proposed development does not adversely impact on the integrity of the designated area.

3. Assessment criteria

Planning applications for wind energy developments will generally be assessed against the criteria set out below and therefore all applications will be required to submit an evaluation of the project against these criteria.

An application that is subject to an EIS will as a matter of course address all of these areas, but the level of details required under each 'heading' can be determined and scoped with the Planning Authority at pre-planning stage.

Those applications under the EIS threshold and not deemed by the Planning Authority to require an EIS, will be required to be accompanied by an Environmental Report, addressing the issues of relevance to the site (which should also be determined and scoped at pre-planning stage).

1. Potential impact of the project on natural heritage, to include direct and indirect effects on
 - flora and fauna;
 - protected sites;
 - habitats of ecological sensitivity and biodiversity value

Where potential impacts are identified, mitigation measures, which may include management plans to deal with the satisfactory co-existence of the wind energy development and the particular species/habitat identified will be required.

2. Potential impact of the project on built heritage including
 - archaeological sites;
 - recorded monuments;
 - protected sites / buildings;

This may include archaeological fieldwork in advance of the application being considered. Buffer zones around such features will be required to be established, the normal zone normally being a 200m radius around such features / sites.

3. Suitability of ground conditions, including soil and subsoil stability and presence of rock. Particular attention will be paid to areas where peaty soils are prevalent or sites on steep slopes, where soil slippages may be more likely. If this issue is identified as a concern, an application for permission will be required to be accompanied by a report by a suitably qualified and indemnified professional, verifying the stability of this area.
4. Site drainage and hydrological effects, such as
 - impacts on ground water
 - impacts on local water supplies
 - impacts on surface water
 - any requirements for watercourse crossings;

Particular detail will be required with regard to the construction phase of the development and measures to be put in place to ensure no negative impacts result on hydrology and water networks. This will include analysis of water flows on and across the site, identification of surface water system in the area, proposals for the management of excavated soil and construction materials (including any oils or other chemicals) during construction.

Some sites may be required to put in place environmental monitoring of ground and surface water for the duration of the operation of the installation.

5. As landscape issues and visual impacts are perceived as the key impact of wind turbines, a detailed assessment of this impact will be required for all applications.

This assessment shall generally be carried out in accordance with best practice guidance available, including that set out by the EPA in *"Advice notes of current practice in the preparation of EIS"* and by the DoEHLG in *"Wind Energy Development Guidelines for Planning Authorities"*.

This assessment shall include an evaluation of the landscape and the ability of it to absorb wind turbines. The cumulative impact of any application with any other such development or application in the vicinity shall also be considered, along with any impacts associated with site works, site roads, structures or new overhead transmission lines. All assessments shall include an analysis of the visual impact of the development from views and prospects listed in the County Development Plan or any Local Area / Town Plan.

Where impacts have been identified, mitigation measures will be required which may include alterations to the layout, spacing, height and number of turbines.

Chapter 6 of the DoEHLG Guidelines provides direction on siting and design issues as they relate to specific landscape character types. The issues addressed are location, spatial extent, spacing, layout height and cumulative extent as set out below:

	Location	Spatial extent	Cumulative Effect	Spacing	Layout	Height
Mountain	Ridge and peaks acceptable in certain circumstances	Large area can accommodate wind developments	Acceptable depending on topography as well as siting and design	All spacing options are usually acceptable. Regular spacing is desirable	Any layout may be acceptable but random or clustered are preferred on ridges and hilltops and grid on broad sweeping areas	Any height
Hills & Flat Farmland	Location on ridges and plateaux is preferred	Generally limited in small scale	Acceptable subject to appropriate siting and design	Regular	Linear and staggered linear layout on ridges and clustered on hilltops	Medium typically preferred but tall may be acceptable on a high ridge
Transitional Marginal	Ridges and hilltops preferred	Generally small relative to context and do not bridge two different land covers e.g. moorland and field areas	Generally not acceptable unless the visual presence of the second wind farm is negligible	All options are open for consideration	Linear and staggered linear layout on ridges and clustered on hilltops	Small-scaled areas, short turbines are more preferable. Varied heights are acceptable in undulating topography
Urban/Industrial	Close to but distinct from structures to ensure autonomy	Relatively limited	Minimal tolerance	Regular spacing is preferred. Graded spacing may be used to aesthetic effect	Linear or staggered line is preferred	Low enough to not dominate existing buildings. A few tall turbines may be successful relative to scale of existing buildings
Coastal Zone	Located on solid ground, suited to low beach shorelines as well as rocky promontories	Depends on the shoreline. Wind energy development should not extend beyond one particular shore line	Minimal Tolerance. A second wind farm may be acceptable only at a very great distance with minimal visual presence	Regular spacing is preferred	Linear or staggered linear layout	Generally tall especially close to and parallel beaches

6. Local environmental and safety issues including

- noise;
- shadow flicker;
- interference with communications;
- aircraft safety
- proximity to power lines.

In evaluating potential noise impacts, regard shall be taken of the guidance set out Section 5.6 of the Wind Energy Guidelines (DoEHLG 2006).

Conditions may require the monitoring of noise throughout the operational phase of the development. In the event that the monitoring shows that any turbine is exceeding its projected noise levels and is having a detrimental noise impact, mitigating measures shall be agreed with the Local Authority.

An assessment of the theoretical shadow flicker will be required for all dwellings within 600m of any turbine. A further assessment shall indicate the likely level of shadow flicker based on anticipated meteorological constraints. If required, mitigating measures shall be proposed.

As wind turbines produce electromagnetic radiation, they may interfere with broadcast communications. In this regard, all applicants should consult with national and local broadcasters prior to the lodging of planning applications to determine the likelihood of any impacts and develop mitigation measures.

As wind turbines may have implications for the operation of Air Traffic Control systems and flight paths, regard shall be taken of the Irish Aviation Authority's 'Obstacles to Aircraft in Flight Order (2002) as amended.

Adequate clearance between structures and overhead power lines as specified by the electricity undertaker should be provided.

7. Adequacy of local access road network to facilitate construction of the project and transportation of large machinery and turbine parts to site
Where it is evident that there may be difficulties in this regard, an outline of the likely transportation route shall be submitted at application stage. However, it is acknowledged that this is more of an operational issue that can normally be resolved through discussion and agreement with the local area engineer and other safety bodies. Therefore, it would be more normal for this to be agreed prior to the commencement of development.
Planning applications will include financial bonds for the repair or re-instatement of any public roads that may be damaged as a result of the transportation of materials.
8. Adequacy of the proposed entrance to the site. Notwithstanding the fact that the construction phase will have a limited duration, any application will need to provide a suitable entrance for both the construction and operation phase of the development. In this regard, sightlines and gradient will be required to meet applicable road safety standards.
9. The provision of water and effluent disposal facilities for construction and operation personnel.

4. Environmental Impact Assessment

An Environmental Impact Assessment is mandatory for wind energy developments that exceed the following thresholds:

- have more than five turbines, or
- will have a total output greater than 5 megawatts.

In these circumstances, an Environmental Impact Statement must be submitted with the relevant planning application (Section 176 of the Planning & Development Act 2000, and Article 93 and Schedule 5, of the Planning & Development Regulations, 2001).

Certain sub-threshold developments also require an Environmental Impact Assessment. The information gathered during the Environmental Impact Assessment process should be used to guide the planning and design of the wind energy development so that sensitive ecological or hydrological areas are avoided, and any negative impacts are minimised insofar as is possible. Avoidance or reduction of negative impacts on the environment and the consideration of alternatives are fundamental components of Environmental Impact Assessment, both in terms of legal requirements and best practice. In designing wind energy projects, there is huge potential to avoid or reduce negative environmental impacts, owing to the small size of the actual development footprint.

Sub-threshold developments:

An Environmental Impact Assessment shall be carried out for wind energy developments below the above mandatory limits if the Planning Authority (or An Bord Pleanála on appeal) considers that the development would be likely to have significant effects on the environment, by reference to the significant criteria in Annex III of the Environmental Impact Assessment Directive as transposed in Schedule 7 of the Planning & Development Regulations, 2001. Regard should also be had to the guidance contained in Environmental Impact Assessment (EIA) Guidance for Consent Authorities regarding Sub-threshold Development, issued by the DoEHLG in August 2003.

5. Pre-planning

The primary purpose of consultation is to improve the quality of a subsequent application, to avoid the necessity for seeking additional information and in some cases to spare the costs of what is likely to prove an unsuccessful application.

Consultation can be of value in:

- highlighting development plan objectives on wind energy;
- suggesting need for specialist input.

To ensure that pre-application consultation is as productive as possible a developer shall be invited to submit a minimum level of documentation in advance of the meeting, as follows:-

- site location map
- indication of the number of turbines proposed and their individual heights
- sample zones of theoretical visibility
- details of any known protected natural or built features on or surrounding the site

Good research and wide consultation by all parties at the site selection stage can avoid unnecessary time delays and expense in considering unsuitable sites.