

Design Changes

This information sheet describes significant revisions to the Nant y Moch Wind Farm proposal since it was first presented to the public at exhibitions in June 2009 in order to achieve the final layout presented at this Launch Event. Changes which occurred before and after the second round of exhibitions in June 2010 are presented separately. The proposal has been developed and adapted, drawing on the extensive range of surveys and assessments conducted for the Environmental Impact Assessment (EIA), as well as feedback from the public and key consultees. Changes are referenced to the map overleaf where relevant, which shows the June 2009 and final proposed wind turbine locations and final access track routing. The final layout represents the culmination of the EIA process and SSE-R's considered view of the best available wind farm development at the Nant y Moch site, given the known constraints and sensitivities. A more detailed plan of the final proposed layout can be found on the exhibition panels at this Launch Event.

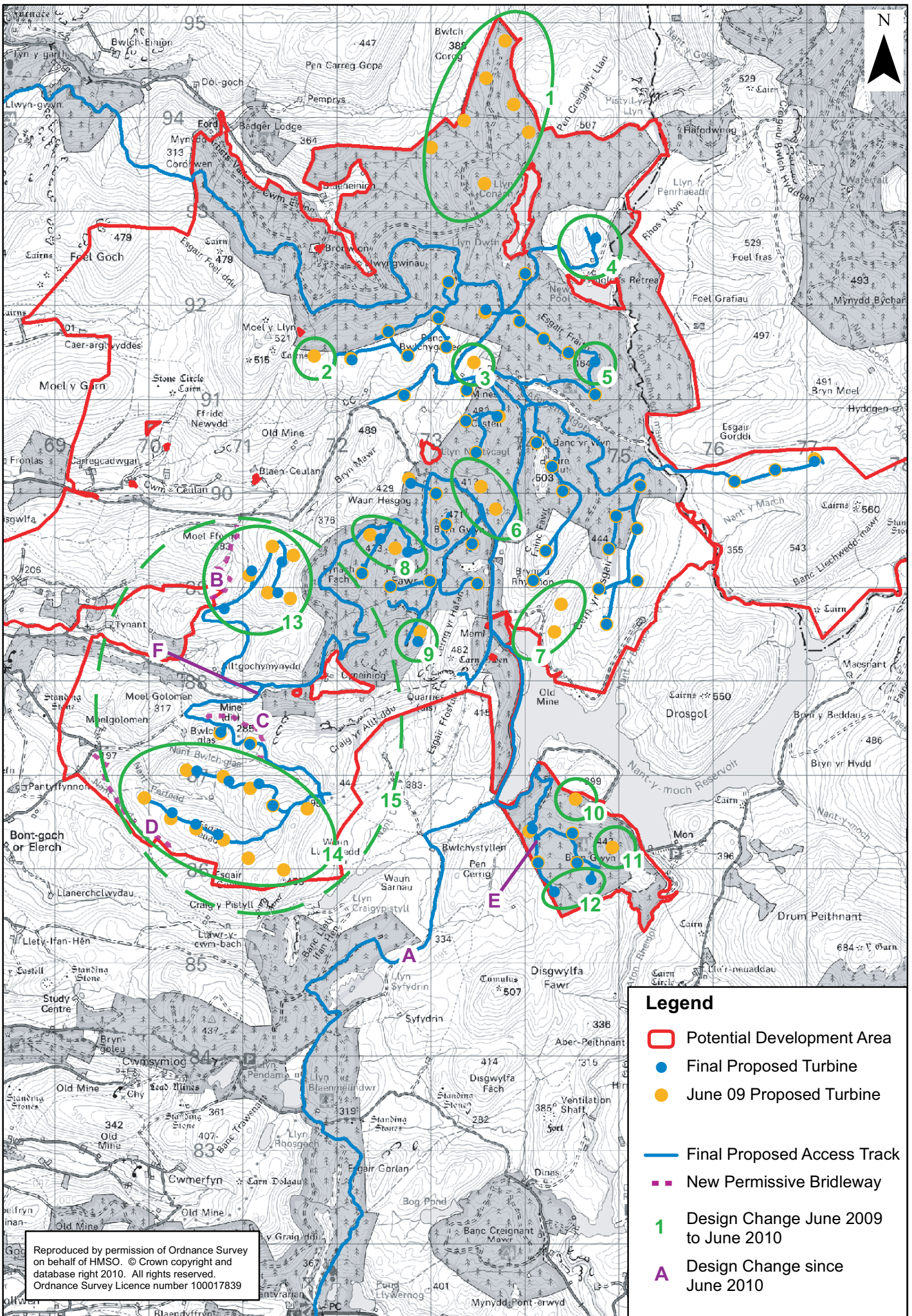
Revisions Since the June 2010 Exhibitions

Map Ref	Design Change	Rationale
A	Confirmation of the proposed access route for Abnormal Load deliveries via Nant yr Arian	Access via Nant yr Arian was assessed as the preferred route for Abnormal Loads, considering a number of factors including the quality of the road network, potential disruption to local residents and road users and public and consultee feedback. The precise route used from Nant yr Arian has been selected to make best use of existing infrastructure and minimise impacts on the visitor centre and on peat and other environmental sensitivities.
N/A	Confirmation of use of infra-red aviation lighting	Following discussions with the Ministry of Defence, infra-red lighting of turbines, which is not visible to the naked eye, has been confirmed as an acceptable solution to ensure the safety of military aircraft using the area. SSE-R considers infra-red lighting to be the preferred approach as it avoids the visual impacts associated with visible lights.
B, C, D	Provision of new permissive bridleway routes	Provision for Public Right of Way users who wish to maintain a distance of the order of turbine tip height or greater to the turbines (see Public Rights of Way Briefing Sheet for further information)
E	Minor alteration to access track alignment	An opportunity to further minimise impacts on peat habitat was identified in final review of the proposed layout.
F	Revision of proposed access route to use the location of the existing crossing of the Afon Cyneiniog	Further consultation with the Local Highways Authority identified a preference to upgrade the existing river crossing rather than providing a new crossing as had been proposed.

No other substantive changes to the wind farm proposal have been made since the Public Exhibitions held in June 2010. No new information necessitating reconsideration of turbine locations or other aspects of the layout design (for example details on new sensitivities which would need to be considered in the EIA) was received through public consultations during or following these exhibitions.

Revisions Between the June 2009 and June 2010 Exhibitions

Map Ref	Design Change	Rationale
1	Removal of the northernmost 7 wind turbines	These turbines were removed as a result of a review of the visual impact of the wind farm, which identified this area as performing poorly in visual terms and appearing as an 'outlier' to much of the rest of the proposed scheme. Removing these turbines significantly reduces the extent of the wind farm in views from locations to the north west including Borth, Aberdyfi and the Snowdonia National Park. This revision also reduces visual and noise impacts to isolated properties closer to the site, including at the head of Cwm Einion.
2	Removal of the westernmost wind turbine on Banc Bwlchgarreg	The originally proposed location for this turbine proved to be an area with sensitive peat ecology. Whilst it would have been possible to re-site it around this constraint, a review of the visual impact of the wind farm also identified it as one of the worse performing locations and its removal helped reduce noise impacts to isolated properties at the head of Cwm Einion.
3	Removal of a wind turbine close to the Esgair Hir mine	This turbine was removed due to hydrological and peat sensitivities. This also had the added benefit of reducing visual clutter in the centre of the site.
4	Addition of a new wind turbine north of New Pool	Further survey work identified this additional viable location.
5	Addition of a new wind turbine at the eastern end of Esgair Fraith	Further survey work identified this additional viable location.
6	Removal of two wind turbines in the centre of the site close to Nant Rhuddlan	Analysis and modelling of wind flows on the site indicated that this location was not suitable due to very high wind shear (variation of wind speed with height).
7	Removal of two wind turbines immediately north of Nant y Moch Reservoir	Analysis and modelling of wind flows on the site indicated that one of these locations was not suitable due to very high wind shear (variation of wind speed with height). Archaeological sensitivities and historic mine workings along the only available access route and limited but relatively deep peat at the turbines lead to a decision to remove both locations.
8	Relocation of two wind turbines north of Fynach Fawr	The westernmost of this pair of turbines was relocated to a position where the turbine base and harstandings would be easier to construct, thereby minimising cutting works which can be visually intrusive. The other turbine was then moved to maintain the required separation between the turbines.
9	Relocation of one wind turbine at Moel Cyneiniog	This turbine was moved south to avoid an area of relatively deep peat identified as sensitive through peat probing and ecological surveys.
10	Removal of one wind turbine at the north of Bryn Gwyn, south of Nant y Moch Reservoir	Analysis and modelling of wind flows on the site indicated that these locations were not suitable due to very high wind shear (variation of wind speed with height).
11	Removal of one wind turbine at the east of Bryn Gwyn, south of Nant y Moch Reservoir	This turbine was removed as a result of a review of the visual impact of the wind farm, which identified it as particularly dominant in views from the car park adjacent to the reservoir.



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Legend

- Potential Development Area
- Final Proposed Turbine
- June 09 Proposed Turbine
- Final Proposed Access Track
- - - New Permissive Bridleway
- 1 Design Change June 2009 to June 2010
- A Design Change since June 2010

Map Ref	Design Change	Rationale
12	Addition of two new wind turbines at the south of Bryn Gwyn	Further survey work identified these additional viable locations, which were not subject to the wind shear issues or level of visual sensitivity note above.
13	Revision of wind turbine locations on private land to the east of Moel Fferm	Turbine locations in this area were extensively revised including reducing the number of turbines from 5 to 4. Primary reasons for the revision were improving separation to public rights of way, achieving locations where the turbine base and harstandings would be easier to construct and reducing noise impacts to properties at the head of Cwm Ceulan to the north.
14	Revision of wind turbine locations on private land around Esgair Neuadd and Pen Craigyppistyll	Turbine locations in this area were extensively revised including reducing the number of turbines from 11 to 7. Primary reasons for the revision were improving visual performance following a review of the visual impact of the wind farm, improving separation to public rights of way, and in the case of the easternmost turbines in this group, also reducing impacts on the setting of scheduled ancient monuments. The design revision has helped reduce visual impact to a wide range of locations and specifically visual clutter and dominance when viewed from Bont Goch.
n/a	1.5m increase in the proposed maximum tip height of the turbines (from 145 to 146.5m)	Further wind resource analysis and discussions with turbine manufacturers identified that this slight increase in the maximum height was required in order to accommodate a selection of the most appropriate turbines models for this site. Turbines from established manufacturers including Vestas, Siemens and RePower are under consideration. SSE will determine the actual turbines to be used closer to the time of build, if planning permission is received. They will need to fit within the maximum dimensions proposed.
15	Reduction of the maximum tip height of turbines in the south west of the site, outside the the forestry land, to 126.5m (80m hub height)	The primary reason for the use of 100m tower heights on this site is to reduce the effect on the turbines of turbulence and wind shear caused by the trees. For turbines in the south west of the site, where there is no forestry affecting the prevailing south-westerly winds, turbulence and wind shear are less of a concern and shorter towers are an option. A review of the visual impact of the wind farm concluded that reducing turbine heights in this area would significantly improve the visual performance of the overall scheme, especially in terms of views from Bont Goch, and from locations to the north west including Borth, Aberdyfi and the Snowdonia Nation Park.

In addition to the revisions to turbine locations described above, changes were made to track routing and elements of other site infrastructure as a result of peat probing and other surveys. Most significant of these changes was the relocation of the substation to a position adjacent to the public road near the centre of the site. The previously proposed substation location at Bryn Glas was found to be on relatively deep peat.

The new location is one of the few other areas within the site that offers sufficiently level ground for the substation. As the design has developed, proposed locations were also confirmed for various other elements of the development, including permanent met masts, borrow pits and temporary construction compounds, laydown space and a concrete batching plant.