Pennant Walters Ltd

Mynydd Glyn Wind Farm

Draft Environmental Statement

Appendix 14A Telecommunications Mynydd Y Glyn

This report was prepared by WSP Environment & Infrastructure Solutions UK Limited (formerly known as Wood Environment & Infrastructure Solutions UK Limited), company registration number 02190074, which is carrying out these services as a subcontractor and/or agent to Wood Group UK Limited

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WPAC
Wind Power Aviation Consultants Ltd

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Aviation Project Review Note for Wood Group UK Ltd
Mynydd Y Glyn Wind Farm

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Initial Project Review Feasibility - Briefing Note re Mynydd Y Glyn Wind Farm

Introduction and Scope

- Pennant Walters are planning to develop a wind farm at Mynydd Y Glyn, Mid Glamorgan, and are advised by Wood Group UK Ltd who have requested aviation consultancy advice from WPAC Ltd. This IPR briefing note is a stripped down version of a full aviation report, which may still need to be undertaken if the site is taken forwards in order to fully identify aviation risks and where possible identify consultation and mitigation strategies where needed.. The assessment assumes a development of 7 turbines of up to 180 metres to tip. Radar modelling of all turbines has been undertaken in order to identify any potential radar interference issues. This note will also flag up any issues that in our judgement would create an aviation effect critical to the feasibility of the site. Some initial GIS is also provided to show the location in an aviation context.

- WPAC is currently advising developers and planners on approximately 60 planning applications throughout the UK including 10 in Wales. Since 2008 we have assessed over 3000 wind farm proposals, provided EIA chapters to many planning applications and given expert witness evidence at more than 20 planning inquiries. We have also provided aviation advice to the Welsh Government and negotiated a number of wind farm issues with Cardiff International Airport. Further information is available at www.wpac.co.uk

Documentation Provided

- Turbine Layouts
- Site Map

Turbine	Location	Turbine	Location
1	ST 02930 89735	5	ST 04185 89380
2	ST 03395 90000	6	ST 03070 88985
3	ST 03185 89395	7	ST 03525 88975
4	ST 03690 89455		

Table 1 Turbine Locations

Background

- The site is located as shown in Figures 1 to 3. Figures 2 and 3 show the location in an aviation context with Figure 2 showing the airspace up to 5000ft and Figure 3 up to 19500 ft.. Figure 2 shows that the site is 21km to the north of Cardiff International Airport and MOD St Athan. It is under the Cardiff Control Area (CTA), Class D regulated airspace, controlled by Cardiff Airport. Figure 3 shows that it is also under Class A controlled airspace in the form of the Cotswold CTA. The site is also adjacent to a Visual Reporting Point (VRP) at Taff Ely Windfarm. There are already a number of wind farms marked on aviation charts in the area.

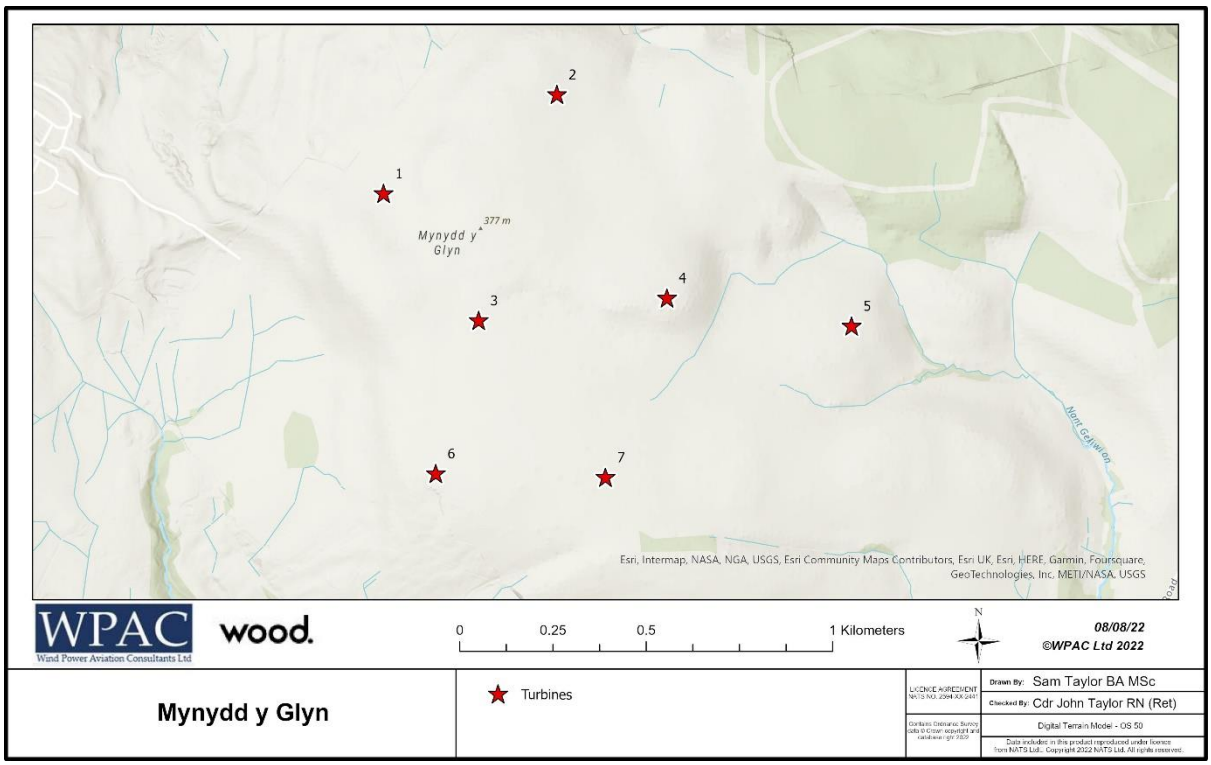

Figure 1

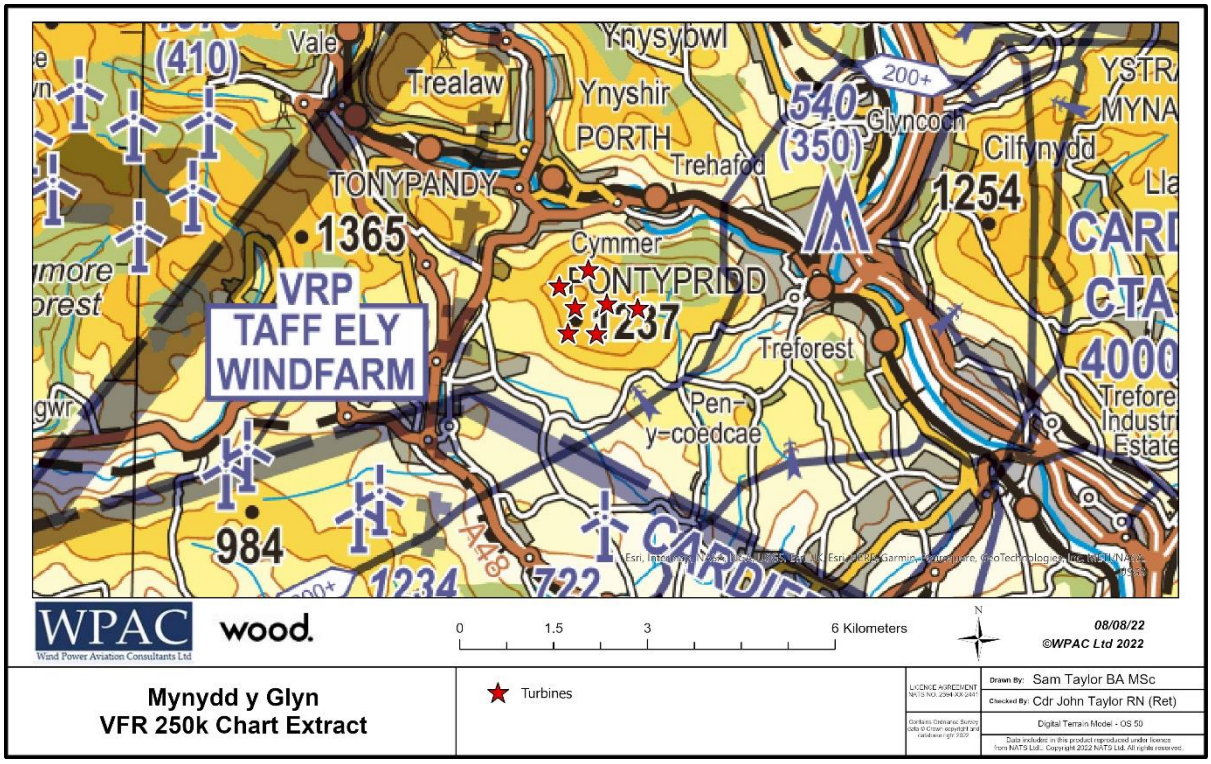

Figure 2

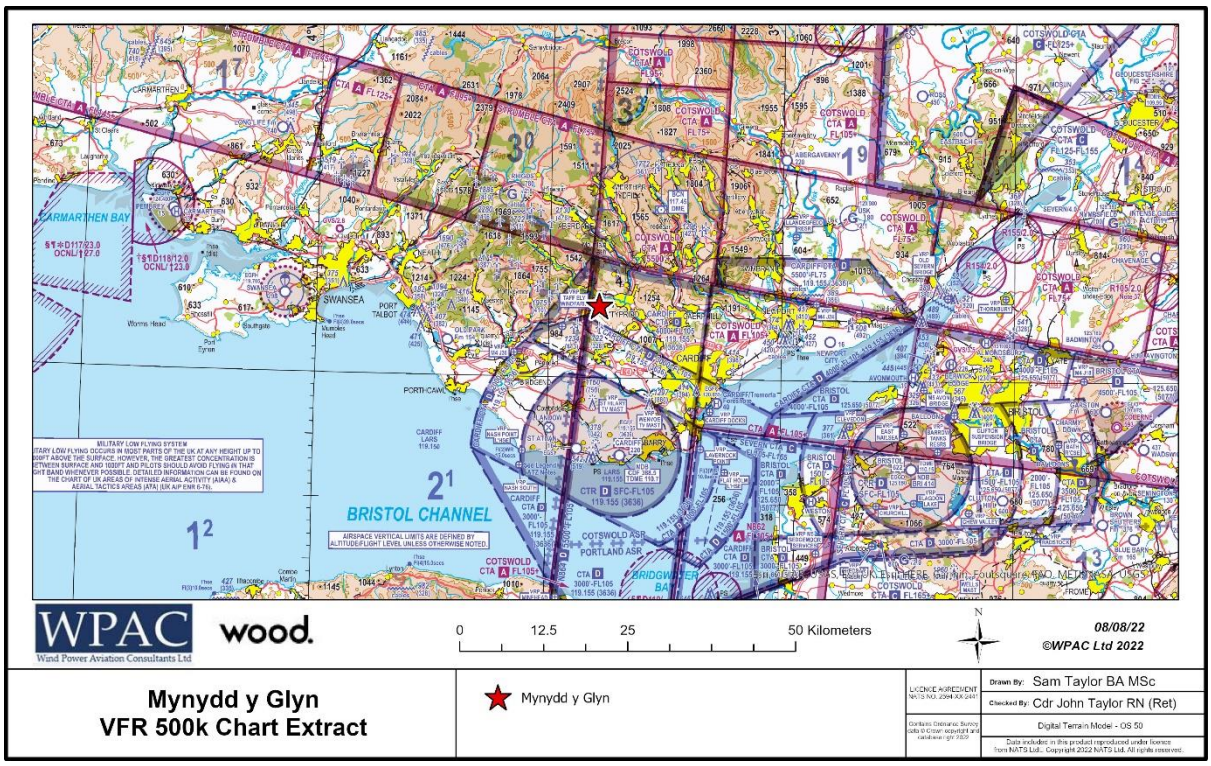

Figure 3

Aviation Issues

- **MOD** –The closest military ATC radars are at RAF Brize Norton and RNAS Yeovilton. Radar line of sight results for Yeovilton are at Table 2. The Brize Norton radar cannot see below 500 metres in this location. There is an additional MOD ATC radar located at Hartland Point, used at RNAS Yeovilton for training of fighter control students, with aircraft operating over the Bristol Channel and South Wales. The results for Hartland Point are at Table 3.

- The good news is that the turbines will be screened by terrain from all three radars and there will be no MOD ATC radar objection to the proposed development.

Turbine	Radar Line of Sight (metres AGL)	Turbine	Radar Line of Sight (metres AGL)
1	465.6	5	414
2	414.5	6	472.8
3	434.2	7	430.5
4	380.2		

Table 2 RNAS Yeovilton

Turbine	Radar Line of Sight (metres AGL)	Turbine	Radar Line of Sight (metres AGL)
1	275	5	325.2
2	281.1	6	277
3	276.3	7	266.3
4	257.3	8	

Table 3 Hartland Point Radar

- **Air Defence Radar** – the closest AD radar is at Portreath in North Cornwall. Radar modelling has been undertaken which shows that the turbines will be screened by at least 500 metres by terrain and there will be no MOD AD radar objection.

Low Flying –

- The Mynydd Y Glyn site is located well outside of any MOD Tactical Training Areas and examination of detailed MOD low flying charts (not available to the general public) show that the site is not within a choke point or flow arrow within the low flying system. It is also the case that it is located within a 'Green' area as shown in the MOD wind farm low flying chart as shown in the extract at Figure 4.

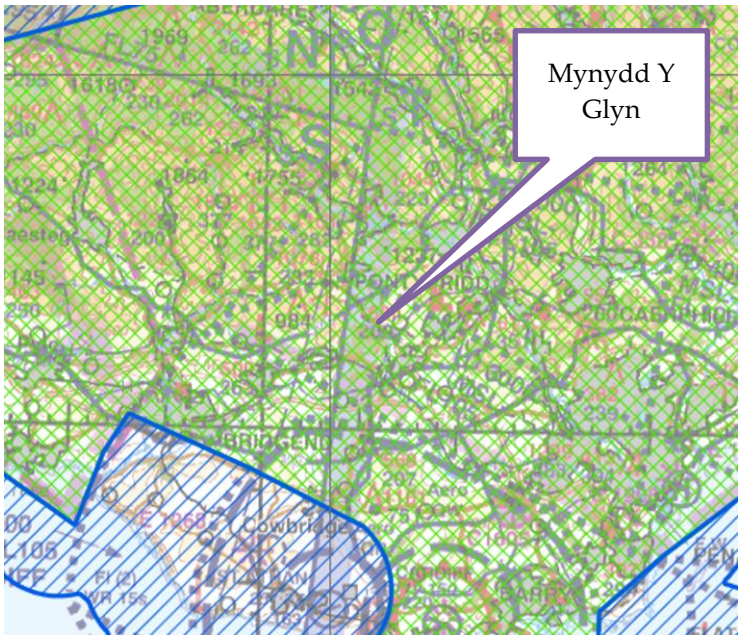

Figure 4 Low Flying Chart Extract

- A Green Area is defined as: '*Areas with no military low flying concerns*'. It is the case that in a green area, low flying does not routinely take place due to other constraints such as population density, airspace or other factors, however, the MOD may raise a 'concern' in order to ensure that the turbines are fitted with Infra-Red obstruction lights which are not visible to the naked eye.

- **Met Office Radars** –In this case the closest Met Office radars are at Crugg Y Goryllwynn and Clee Hill. The Met Office will only become concerned where turbines are likely to be in line of sight of their radars within 20km. Both of these radars are well beyond that distance. Crug Y Goryllwynn is over 80km to the west.

Civil Radar Equipped Airports

- **Cardiff Airport** – Cardiff is a busy airport 22 km to the south. Radar modelling has been undertaken with the results shown in Table 5. Every turbine will be visible to the radar and the proposed development will create a large area of radar clutter and other effects such as track obscuration over the site on the displays at the airport.

Turbine	Radar Line of Sight (metres AGL)	Turbine	Radar Line of Sight (metres AGL)
1	29.1	5	13.5
2	35.9	6	0
3	4.9	7	0
4	0		

Table 5 Radar Line of Sight for Cardiff Airport Radar

- The situation at Cardiff is slightly confusing in as much as NATS Services PLC (NSP) provide ATC services to Cardiff Airport under contract. The airport is owned and operated by the Welsh Government and Cardiff Airport is the CAA license holder and responsible for the safe operation of the airport. At a distance of only 22km and in an area where they will routinely be vectoring large commercial aircraft an objection is certain and would be justified in my view. Cardiff have in the past shown themselves willing to accept the impact of a number of wind farms on their radar and within their control zone, including Taff Ely and Mynyndd Portref, but they are becoming concerned about the cumulative effect of a number of wind farms in the area on their ability to provide a full radar service.

- The issue then is likely to be the availability of a technical solution, or mitigation. The radar at Cardiff is a Thales Star 2000 which has no wind farm mitigation capabilities, however, a number of other wind farm developers are in discussion with Cardiff about funding the provision of a Terma Scanter 4002 radar which is wind farm capable. This type of radar has already been installed at a number of locations in the UK including Glasgow (also a NATS ATC service contract), Edinburgh, Newcastle and Liverpool. The radar can be located at Cardiff Airport and integrated into the ATC radar display system. It would therefore be sensible to approach Cardiff Airport in order to agree

a planning condition contingent upon the provision of a Terma radar. Another developer is already likely to fund the radar and then recover costs from other developers who wish to make use of it. It will be important to gain Cardiff and NATS agreement for this approach but it should be considered as non-contentious and it is certainly not a risk from a technical perspective as this type of radar is already installed and working elsewhere in the UK as a wind farm mitigation system. It will require an approach to both NATS as the service provider and Cardiff Airport as the license holder.

- **To conclude**: the turbines **will be visible to the Cardiff radar**, they are likely to maintain an objection and mitigation is likely to be available. The proposed development is well within the coverage of the Terma radar. The only issue will become one of affordability. The action required is to set up a meeting with Cardiff/NATS in order to enable a condition to be agreed.

- **Bristol Airport** – the site is also 53km from Bristol Airport. Radar modelling has been undertaken with the results in Table 6. The results show that the turbines will all be visible to Bristol Airport's radar. It is likely that Bristol will be able to tolerate the effect as they do not have any mandate to control within the Cardiff Control Area, but the turbines will certainly create clutter on the displays. Bristol will need to be consulted through NATS if this has not already been undertaken.

Turbine	Radar Line of Sight (metres AGL)	Turbine	Radar Line of Sight (metres AGL)
1	45.2	**5**	0
2	10.1	**6**	6.4
3	2.7	**7**	0
4	0		

Table 6 Radar Line of Sight Bristol Airport

- **Light Aircraft Landing Strips, Gliding and Microlight Sites –** none marked on charts or known within the defined consultation distances..

- **NERL** – this is where things can get slightly confusing – NERL is NATS En Route Ltd, a separate organisation to NATS Services Ltd (variously called NSL or NSP) although they are clearly connected. NERL provides ATC services mainly in the '*en route*' environment using a network of radars, radio stations and navigation aids. The radars are networked together and utilised by controllers at the London Centre at Swanwick in Hampshire. There are two radars that cover this area at low level, Clee Hill in Shropshire and Burrington in Devon; radar modelling has been undertaken for both radars. In the case of Burrington there is no radar line of sight below 500 metres. The results for Clee Hill are shown in Table 7. These results are good news as radar line of sight is up at over 500 metres AGL and the radar will not be affected by the turbines. There will be no NERL objection in relation to radar or any other en route facility.

Turbine	Radar Line of Sight (metres AGL)	Turbine	Radar Line of Sight (metres AGL)
1	620.7	**5**	620.7
2	609.2	**6**	618.9
3	596.1	**7**	594.8
4	579.6	8	

Table 7 Clee Hill Radar

Aviation Lighting

- With turbines in excess of 150 metres to tip there is a requirement to illuminate them with medium intensity red obstruction lights on the nacelle. There is also the requirement to provide IR lighting for the MOD. WPAC design lighting layouts to minimise the number of lit turbines and gain MOD and CAA approval. There is also a requirement for mid mast lights, halfway up the tower. These are low intensity red lights but are very poorly designed and often have a greater visual impact than the hub lights. Where feasible WPAC can negotiate a waiver to this requirement with the CAA. Finally we provide a full lighting report which includes calculations of the effect of the lights on designated viewpoints which is used to inform the LVIA. We are currently working with Wood on a number of sites in Scotland where this work is being undertaken.

Conclusion

- **MOD ATC Radar –** no radars affected
- **MOD Low Flying –** the site is in a Green area and an MOD low flying objection is extremely unlikely
- **MOD Air Defence Radar –** none affected
- **Met Office Radar –** none affected
- **Light Aircraft Landing Strips –** none to affect
- **Civil Airports –** the turbines will all be visible to Cardiff Airport radar and technical mitigation will be required. The turbines will also be visible to Bristol Airport radar but an objection is very unlikely.
- **NERL –** all the turbines will be screened by terrain from NATS en route radars.

Next Actions

- Discuss mitigation options with Cardiff, it should be possible to agree a planning condition to mitigate by utilizing a Terma Scanter 4002 radar which another developer wants to fund as a mitigation for a wind farm.

- There are discussions under way at the moment. A developer group is forming to drive through the Terma mitigation for Cardiff Airport, although I think the airport will be waiting for the outcome of the Upper Ogmore decision before deciding to proceed with suspensive conditions. This group is being started by Sam Johnson at RES as they have clearly got an interest at Upper Ogmore. I would also caution that developer groups that dont have any aviation expertise can sometimes become overly optimistic or misunderstand the technical issues, leading to unjustified optimism. It is also challenging to get wind farmers to work together on anything as you are all in competition, I have the scars to show for it.

- Lighting – aviation lighting will be required and a lighting design and impact assessment undertaken to both minimise the visual effect and to inform the LVIA.

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