



Galileo 03 Ltd.

Mynydd Ty-talwyn Energy Park - Environmental Statement Volume III

Appendix 4.8: Telecommunications Constraint Investigation

Project Reference: 663870

APRIL 2026

Telecommunications Constraint Investigation

Mynydd Ty-talwyn Energy Park

Galileo 03 Limited

April 2026

PLANNING SOLUTIONS FOR:

- Solar
- Telecoms
- Railways
- Defence
- Buildings
- Wind
- Airports
- Radar
- Mitigation

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ADMINISTRATION PAGE

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Date:	April 2026
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Issue	Date	Detail of Changes
1	February 2023	Initial issue
2	March 2025	Updated response from JRC
3	October 2025	Updated layout and administrative revisions
4	April 2026	Updated layout plan (change to ecological mitigation only)

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ABOUT PAGER POWER

Pager Power is a dedicated consultancy company based in Suffolk, UK. The company has undertaken projects in 63 countries within Europe, Africa, America, Asia and Australasia.

The company comprises a team of experts to provide technical expertise and guidance on a range of planning issues for large and small developments.

Pager Power was established in 1997. Initially the company focus was on modelling the impact of wind turbines on radar systems. Over the years, the company has expanded into numerous fields including:

- Renewable energy projects.
- Building developments.
- Aviation and telecommunication systems.

Pager Power prides itself on providing comprehensive, understandable, and accurate assessments of complex issues in line with national and international standards. This is underpinned by its custom software, longstanding relationships with stakeholders and active role in conferences and research efforts around the world.

Pager Power's assessments withstand legal scrutiny and the company can provide support for a project at any stage.

1 BACKGROUND

1.1 Introduction

Pager Power has been commissioned to investigate the potential wireless communications infrastructure (point-to-point links) constraints associated with the proposed Mynydd Ty-talwyn Energy Park, located within Neath Port Talbot and Bridgend County Borough Council.

This report has been prepared by Pager Power on behalf of Galileo 03 Ltd (part of Galileo Empower UK Ltd) (hereinafter referred to as 'Galileo' or the 'Applicant').

The purpose of the report is to identify where within the Site Boundary the wind turbines can be sited to avoid interference with the wireless communications infrastructure.

This report contains:

- Site description.
- Stakeholder consultation to identify relevant links:
 - Microwave links; and
 - UHF Telemetry links.
- Constraints mapping, including:
 - Plotting of the exclusion zones for the identified links; and
 - Constraints map interpretation.
- High-level overview of common mitigation options.
- Conclusions and recommendations.

2.2 Turbine Details

The turbine coordinates are presented in Table 1 below.

Turbine	Easting	Northing	Turbine	Easting	Northing
1	286968	186094	4	285686	186503
2	286459	186354	5	285732	186989
3	285774	186016	6	284660	186283

Table 1 Indicative turbine characteristics

Table Note: The proposed turbine locations are consistent with the locations proposed and consulted on during the Pre-Application Consultation period (between April 2025 and June 2025), with the exception of a small change to the location of T06. Any differences in the proposed coordinates of the other turbines is associated with rounding.

The turbine dimensions are presented below:

- 119 m hub height;
- 200 m tip height;
- 132 m rotor diameter.

3 COMMUNICATIONS CONSULTATION SUMMARY

3.1 Process

Historically, Ofcom has provided on request a list of parties that operate licensed fixed links within a given search radius of a defined location. This process has been under review since 2018, following GDPR requirements, and has not been formally restarted². Therefore, consultation was undertaken directly with the most prevalent operators³ in order to obtain link details. A review of the Ofcom Spectrum Information Portal was also completed.

3.2 Consultation Overview

Table 2 below presents a summary of the consultation to date.

Link Operator	Summary
Airwave	05/05/2025 – Assessment undertaken by Airwave 07/05/2025 – Report and response received No objection
Arqiva	26/01/23 – PP link request sent. 30/01/23 – Response received. One re-broadcast link identified, which crosses over the Site.
Atkins	26/01/23 – PP link request sent. 01/02/23 – Response received. Requested forwarded to Dŵr Cymru Welsh Water. No response.
BT	26/01/23 – PP link request sent. 01/02/23 – Response received. No identified communications links that cross the Site. No objection.

² To Pager Power's knowledge.

³ Based on Pager Power's experience and contacts database.

Link Operator	Summary
JRC	Stakeholder consultation was previously undertaken by another consultant in November 2022. Pager Power has used this response provided by the JRC during that consultation as the basis of further analysis. 17th September 2024 - WF Coordination – Mitigation Report: Mynydd Ty-talwyn Windfarm Version 0.2 states ‘provided the turbine location remains outside the exclusion zone indicated above, and provided the turbine parameters have not changed, our recommendation to the link operator would be to clear this particular development.’ The full Mitigation Report is provided in Annex A.
Mobile Broadcast Network Limited (MBNL)	26/01/23 – PP link request sent. 27/01/23 – Response received. No objection.
Virgin Media O2	26/01/23 – PP link request sent. 27/01/23 – Response received. No objection.
Vodafone	26/01/23 – PP link request sent. 02/02/22 – Response received. No objection.

Table 2 Telecommunications stakeholder consultation

4 TECHNICAL ASSESSMENT

4.1 Overview

Microwave and UHF⁴ wireless communication links are used to transmit information between two antennae via radio waves within a particular frequency band.

The exclusion zones associated with the identified links have been calculated based on the telecommunications data provided. Further two-dimensional clearance calculations have then been undertaken to determine the extent of any clearance or infringement of the Proposed Development. The following subsections present an overview of the interference mechanisms and methodology.

4.2 Fresnel Zones

A Fresnel Zone takes the form of an ellipsoid surrounding a link path and represents the area in which obstructions should not be sited in order to avoid diffraction losses. The width of the zone at any point along the link path is determined by the Fresnel Zone number, the frequency of the link and the distance from each link end. The width of the zone is maximal at the midpoint of the link path.

4.3 Diffraction – Microwave and UHF Links

Obstructions such as wind developments which are sited in between two microwave link antennae can partially block the radio signal passing between them, thereby reducing the functionality of the link. This can occur even if the obstruction is not directly between the antennae but close to the link boresight⁵. This kind of blocking is called 'diffraction'. There are various approaches to safeguarding microwave links against from obstruction via wind developments. The most common approaches are:

1. Implementation of a fixed stand-off distance around the link boresight;
2. Safeguarding the relevant Fresnel Zone (discussed below).

The first approach is used by many operators who request a set buffer distance. Set stand offs are occasionally conservative and produce a large exclusion zone distance. The second approach is to assess an obstruction on a case-by-case basis to calculate the most accurate exclusion zone. Pager Power considers the Second Fresnel zone when assessing the effect of a turbine/wind development upon microwave links, and 60% of the First Fresnel zone when assessing UHF links.

⁴ Ultra-High Frequency

⁵ This is the straight line between the two antennae.

4.4 Diffraction Zone Constraints Map

The diffraction zones relative to the turbine locations (illustrated as crosses) are presented in Figure 2 below⁶.

The diffraction zones are illustrated by a pair of parallel lines of the same colour, with different colours representing individual links. Exclusion zones for the telecommunication masts are indicated by the blue circles. A 250-metre exclusion zone is applied to microwave link masts and a 500-metre exclusion zone is applied to UHF link masts.

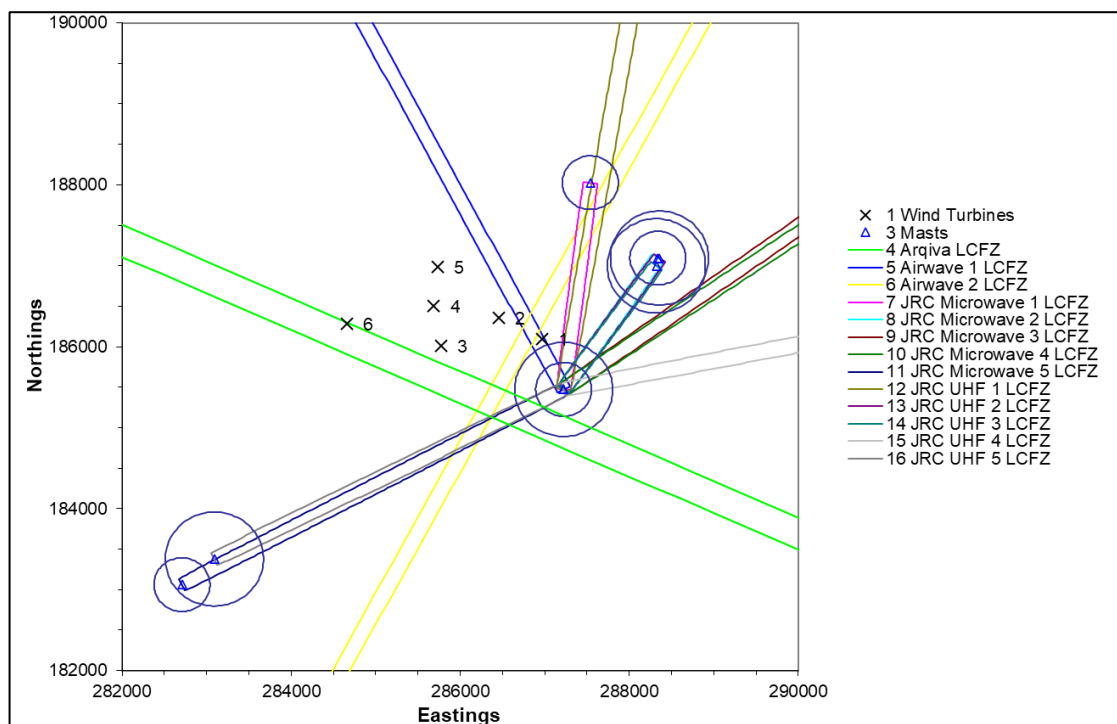


Figure 2 Diffraction zones constraints map

4.5 Results Discussion

The Proposed Development is laterally clear of Arqiva telecommunication infrastructure operating in close vicinity. The minimum lateral distance between any turbine and the telecommunication link is 81.76 m, and clear by 120.97 m in three-dimensions (when considering the height of the masts); 20.97 m greater than the 100 m requested clearance.

Turbine 1 infringes the Fresnel Zone for the Airwave 1 link in two-dimensions by 24.72 m, but clear by 4.08 m in three-dimensions (when considering the height of the masts).

⁶ For links where one of the link ends could not be located, a dummy link end has been used. As the link will be shorter than in practice, the exclusion zone is also likely to be larger than the exclusion zone in practice.

The remaining turbines are clear of the diffraction zones. Airwave have also confirmed they have no objection to the proposed development⁷ (Annex B).

The JRC have confirmed that the Proposed Development would be clear of their infrastructure (Annex A). Note, the JRC assessment was undertaken using a larger number of turbines; two of which have now been removed from the Proposed Development.

⁷ Airwave report 'Mynydd ty-Talwyn Wind Farm Interference-Analysis _06052025'

5 CONCLUSIONS

5.1 Results

BT Group, Mobile Broadband Network Limited (MBNL), the Joint Radio Company (JRC)⁸, Virgin Media O2, and Vodafone have confirmed that their telecommunication infrastructure is clear of the Proposed Development and therefore have no objections.

The Proposed Development is laterally clear of Arqiva telecommunication infrastructure operating in close vicinity. The minimum lateral distance between any turbine and the telecommunication link is 81.76 m.

A review of the Ofcom SIP has identified one microwave telecommunications link operated by Airwave (Motorola Solutions) within close vicinity of the Proposed Development. The Proposed Development is predicted to be clear of this link in three-dimensions by 4.08 m. Airwave have also been consulted (and undertaken their own assessment) and have confirmed they have no objection to the Proposed Development; Minor changes to the turbine layout since consultation with Airwave are limited to just T6, which is not in proximity to the Airwave links.

5.2 Recommendations

If any significant changes are made to the Proposed Development layout, then the consultees should be contacted again with the updated layout.

⁸ Mitigation Report for the JRC is provided in Appendix A

ANNEX A – JRC MITIGATION REPORT

The JRC WF Coordination – Mitigation Report: Mynydd ty Talwyn Windfarm Version 0.2 is presented in the following pages.

WF Coordination – Mitigation Report:
Mynydd ty Talwyn Windfarm

Windfarm under consideration:		Mynydd ty Talwyn Windfarm		
Turbine locations (14/08/24):	T1 (T03) 286816, 185938	T7 (T09) 285231, 186637	Developer stated micro-siting value: Link buffer allowance:	50m 25m
	T2 (T04) 286459, 186354	T8 (T10) 284746, 186822		
	T3 (T05) 285774, 186016			
	T4 (T06) 285671, 186475			
	T5 (T07) 285732, 186989			
	T6 (T08) 284752, 186339			
Developer Details:		Pager Power Ltd		
Link Operator		NGED		
Turbine size (Hub Height / Blade Radius)		Hub 112 m, Blade Length 87.5m		
Assigned Engineer:		Miguel Navarro-Alvarado		
Brief description of proposal:				
This analysis is for the proposal as presented in WF373136 and the proforma dated 14/08/2024. The proposal is to construct 8 wind turbines adjacent to a number of NGED UHF and microwave links.				
A-end Callsign	A-end Site name	B-end Callsign	B-end Site name	
JEWAMS1	Cwm Risca	JEWAMO02	Llynfi SS	
JEWAMS1	Cwm Risca	JEWAMO07	Nottage SS	
JEWAMS1	Cwm Risca	JEWAMO09	Llangewydd SS	
JEWAMS1	Cwm Risca	JEWAMO10	Litchard SS	
JEWAMS1	Cwm Risca	JEWAMO11	Bridgend Grid SS	
JEWAMS1	Cwm Risca	JEWAMO12	Scwyll SS	
JEWAMS1	Cwm Risca	JEWAMO13	Ford Bridgend SS	
JEWAMS1	Cwm Risca	JEWAMO14	Bridgend Estate SS	
JEWAMS1	Cwm Risca	JEWAMO15	Waterton SS	
JEWAMS1	Cwm Risca	JEWAMO16	South Cornelly SS	
JEWAMS1	Cwm Risca	JEWAMO19	Pencoed SS	
JEWAMS1	Cwm Risca	JEWAMO20	Tonyrefail SS	
JEWAMS1	Cwm Risca	JEWAMO21	Cregiau SS	
JEWAMS1	Cwm Risca	JEWAMO22	Court Colman PV	
JEWAMS1	Cwm Risca	JEWAMO23	Llynfi Afan PV	
JEWAMS1	Cwm Risca	JEWAMO24	Cenin PV	
JEWAMS1	Cwm Risca	JEWAMO25	Newton Down WF	
JEWAMS1	Cwm Risca	JEWAMO26	Stormy Down PV	
JEWAMS1	Cwm Risca	JEWAMO27	Pyle Grid PV	
JEWAMS1	Cwm Risca	JEWAMO29	Corntown PV	
JEWAMS1	Cwm Risca	JEWAMO30	Llynfi New SS	
JEWAMS1	Cwm Risca	JEWAMO31	John Pye WF	
JEWAMS1	Cwm Risca	JEWAMO32	Long Acre Farm PV	

Table 1: Link details

WF Coordination – Mitigation Report: Mynydd y Talwyn Windfarm

3 turbines fall within the JRC 1km co-ordination criteria for Scanning Telemetry links, there are no turbines within 500m of any Microwave links.

There have been a number of previous iterations of the layout, this is the latest as advised by the developer. This note outlines the conclusions following detailed analysis and highlights the minimum calculated exclusion zone around the links necessary to reduce interference.

Comments from Analysis:

All turbine locations in relation to the UHF scanning and microwave links are shown below:

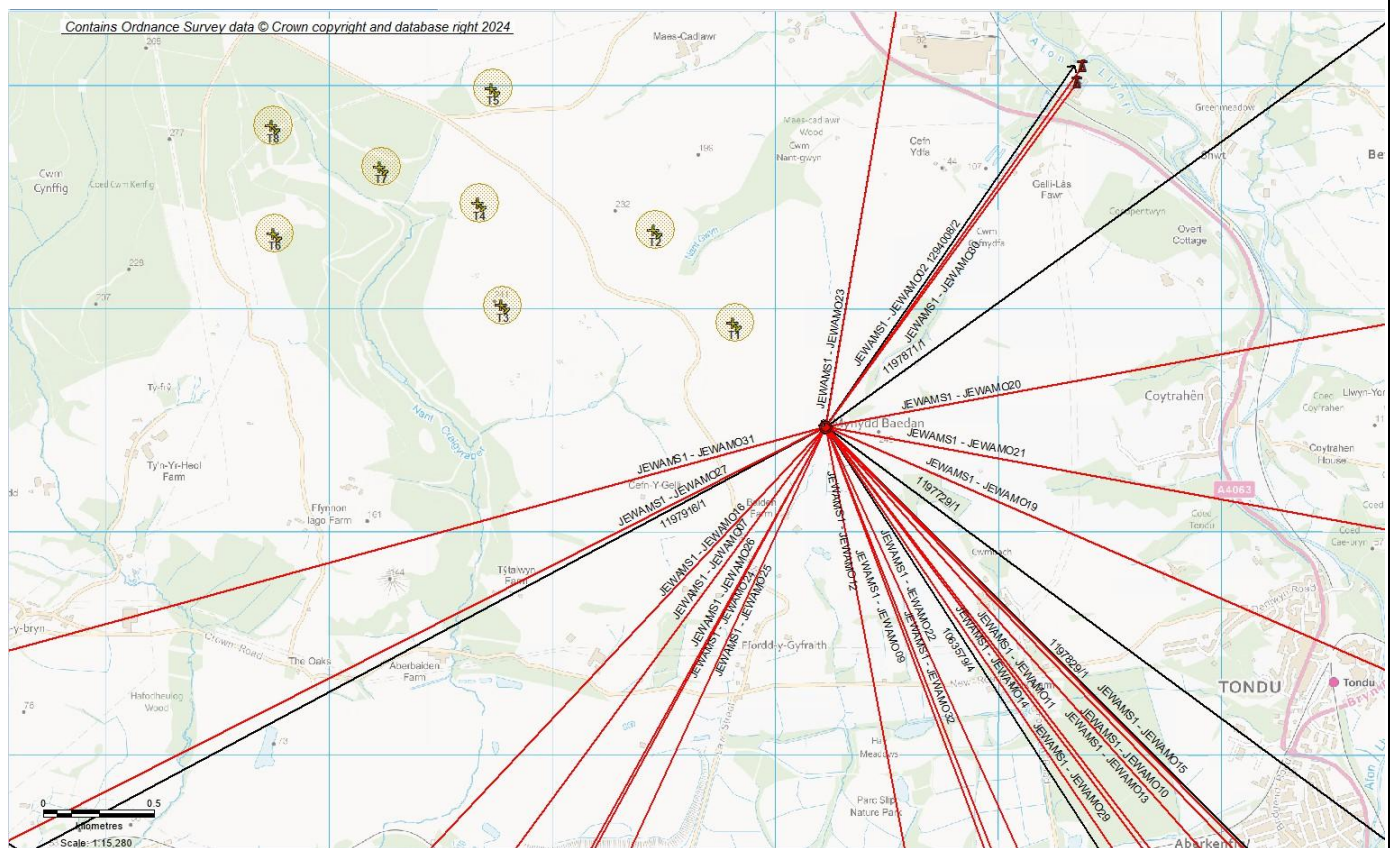


Figure 1: Map of the turbines and affected links

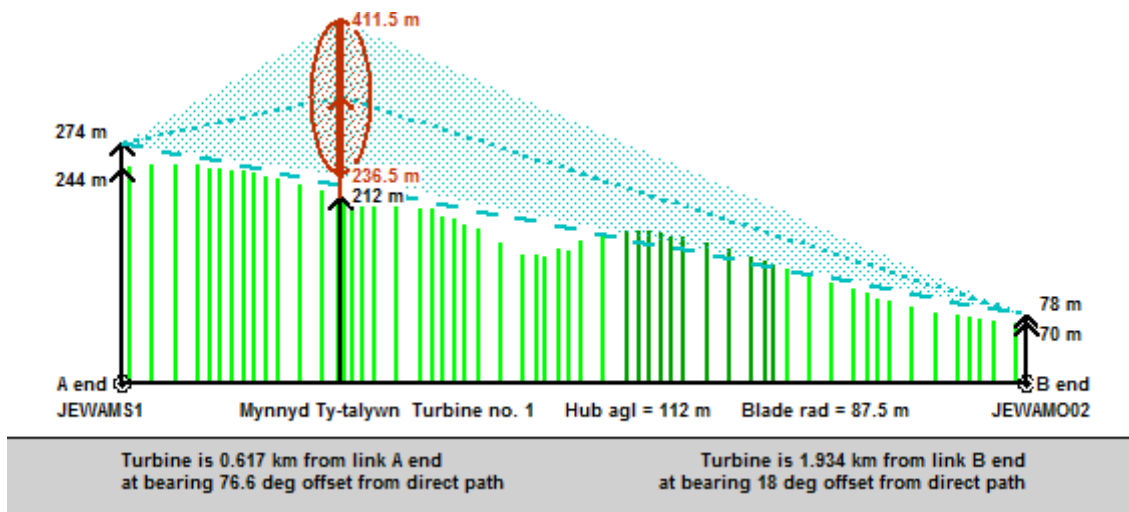
In the current proposed turbine positioning, Turbine T1 (T03) fails the reflection criteria for a number of links using the above assumptions. A summary table of results can be seen below:

WF Coordination – Mitigation Report: Mynydd ty Talwyn Windfarm

		JEWAMS1 to JEWAMO31Cwrm Risca to John Pye WF			JEWAMS1 to JEWAMO23Cwrm Risca to Llynfi Afan PY			JEWAMS1 to JEWAMO27Cwrm Risca to Pyle Grid PY	
	Reflection	Diffraction	Diffraction (MS + LB)	Reflection	Diffraction	Diffraction (MS + LB)	Reflection	Diffraction	Diffraction (MS + LB)
Mynnyd Ty-talywn 1	-3.3	460.7	385.7	-3.8	382.1	307.1	-2.9	505.3	430.3
		JEWAMS1 to JEWAMO02Cwrm Risca to Llynfi SS			JEWAMS1 to JEWAMO30Cwrm Risca to Llynfi New SS				
		Reflection	Diffraction	Diffraction (MS + LB)	Reflection	Diffraction	Diffraction (MS + LB)		
E Mynnyd Ty-talywn 1	-4.0	508.4	433.4	-3.6	509.9	434.9			

Table 2: Summary of results

The Signal Path diagram for Turbine T03 to JEWAMS1-JEWAMO02 (worst case scenario) is shown below:



The signal path diagram shows the signal reflection criteria, where unacceptable interference could occur when the signal from the secondary path via the wind turbine is large compared with the direct signal path. In this instance the direct signal path (allowing for Fresnel effects) is obstructed, whilst the signal paths via the turbine is not as severely obstructed, leading to potential degradation in link quality.

WF Coordination – Mitigation Report:
Mynydd ty Talwyn Windfarm

Details of Further engineering analysis:

The Cwm Risca site currently has an omni antenna set-up, however it is expected to be sectorised due to other operational requirements within NGED.

The following omni antenna links, which fail the reflection criteria due to Turbine T1 (T03), will be updated with sectorised antenna links:

Omni Antenna Link (as of 30/08/2024)	Equivalent Sectorised Antenna Link
JEWAMS1-JEWAMO31	JEWACCB01-JEWACCB016
JEWAMS1-JEWAMO27	JEWACCB01-JEWACCB015
JEWAMS1-JEWAMO30	JEWACCB01-JEWACCB002
JEWAMS1-JEWAMO20	JEWACCB01-JEWACCB003
JEWAMS1-JEWAMO23	JEWACCB01-JEWACCB001

Table 3: Omni/Sectorised Link Details

Analysis for the Mynydd ty Talwyn Windfarm development passes JRC's diffraction and reflection interference criteria when considering these sectorised links instead:

	JEWACCB01 to JEWACCB001Cwm Risca to Llynfi Afan PV			JEWACCB01 to JEWACCB002Cwm Risca to Llynfi SS			JEWACCB01 to JEWACCB003Cwm Risca to Tonyrefail SS		
	Reflection	Diffraction	Diffraction (MS + LB)	Reflection	Diffraction	Diffraction (MS + LB)	Reflection	Diffraction	Diffraction (MS + LB)
E Mynydd Ty-talywn 1	19.1	382.1	307.1	23.6	508.4	433.4	23.1	519.5	444.5
	JEWACCB01 to JEWACCB006Cwm Risca to Bridgend Estate SS			JEWACCB01 to JEWACCB015Cwm Risca to Pyle Grid PV			JEWACCB01 to JEWACCB016Cwm Risca to John Pye WF		
	Reflection	Diffraction	Diffraction (MS + LB)	Reflection	Diffraction	Diffraction (MS + LB)	Reflection	Diffraction	Diffraction (MS + LB)
E Mynydd Ty-talywn 1	15.3	526.3	451.3	23.8	505.3	430.3	18.8	460.7	385.7

Table 4: Summary of results

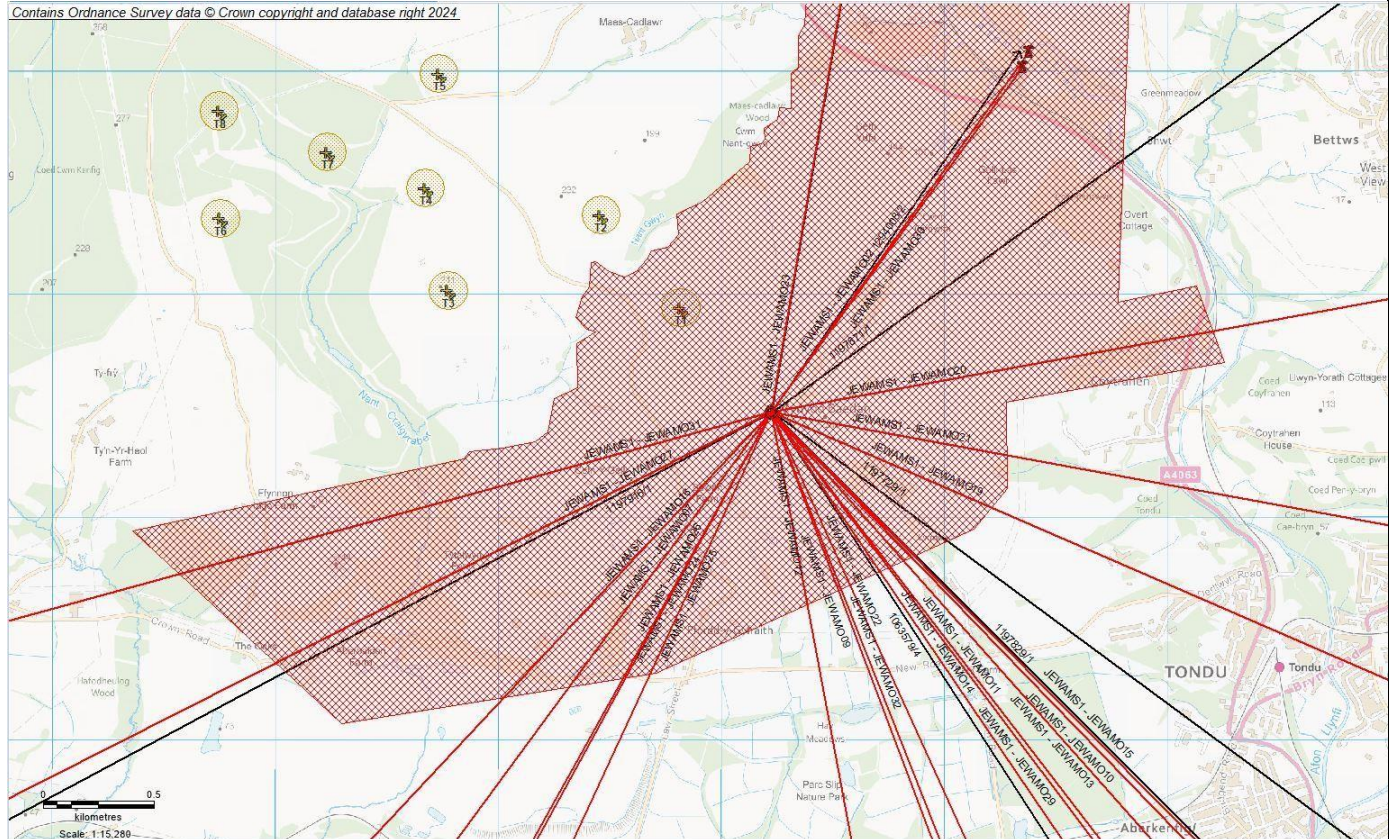
To give a clearer indication of available clearance when comparing the omni and sectorised Cwm Risca site, two exclusion zones have been generated. The exclusion zones have been calculated by analysing the impacts to the most susceptible UHF scanning telemetry paths in the immediate vicinity of the wind farm.

In order to calculate the area in which the turbines can be placed without objection, the minimum clearance zone can be calculated for each of the links in turn, which will ensure that the links are protected from both diffraction and reflection effects based on the turbine location and parameters and assuming a given micro-siting (10m). The combined exclusion zone can then be plotted on a map and provided as a GIS shape file.

This minimum exclusion zone for the links affected by Mynydd ty Talwyn Windfarm in both situations can be seen below.

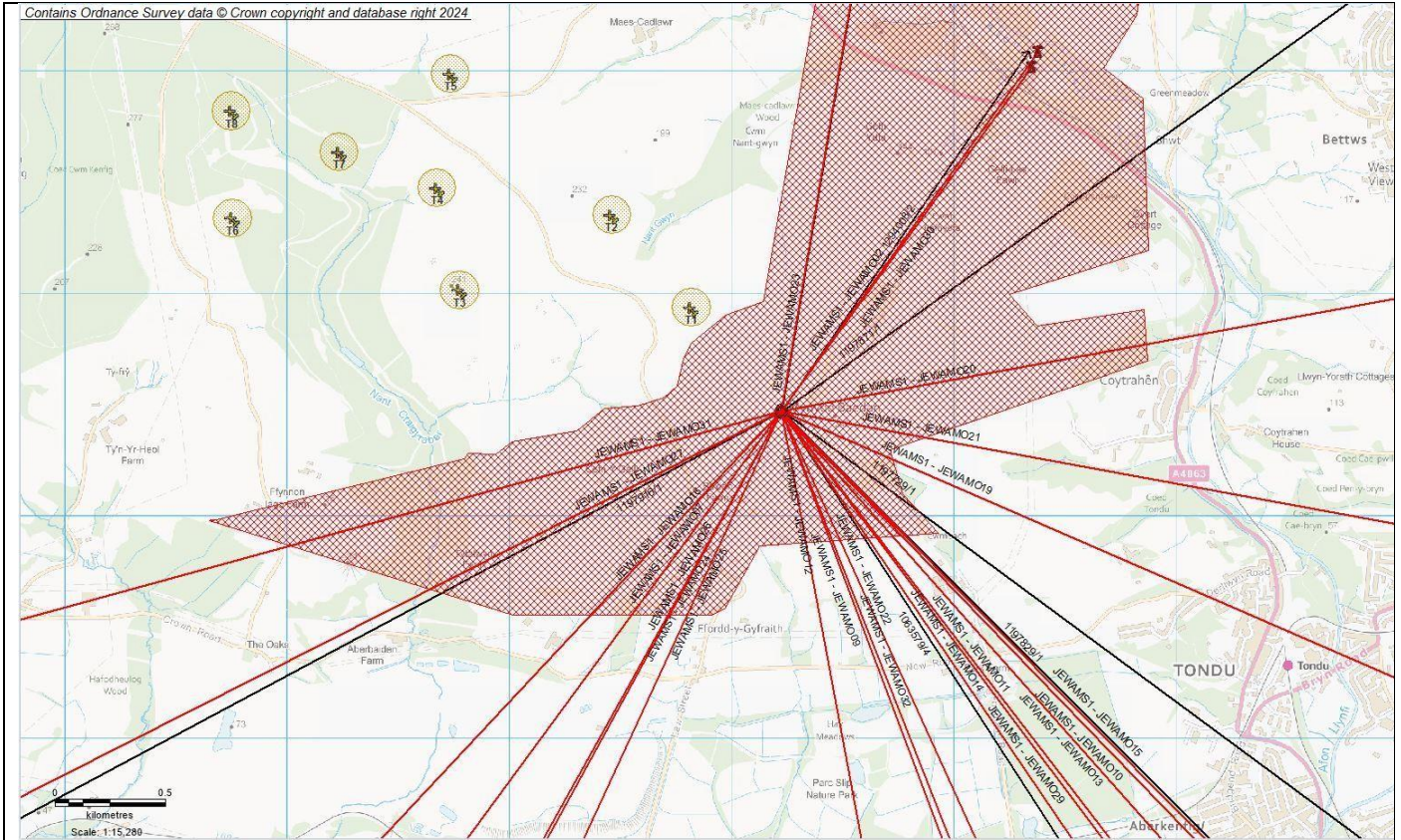
WF Coordination – Mitigation Report:
Mynydd y Talwyn Windfarm

Exclusion zone based on current omni antenna links:



Exclusion zone based on sectorised site upgrade:

WF Coordination – Mitigation Report: Mynydd y Talwyn Windfarm



Both overall exclusion shapes are provided as GIS files (.KML) which will be attached to this report.

It can be immediately seen that Turbine T03 (this is T1 on the map) will be able to remain in its current position following sectorisation. All other turbines are allowed to be built in their current position in either situation.

Engineer's Comments / Conclusion:

WF Coordination – Mitigation Report:
Mynydd ty Talwyn Windfarm

The most appropriate mitigation solution for this wind farm development is to delay the build of Turbine T1 (T03) until sectorisation of Cwm Risca has been completed. The most impacted links listed in Table 3 of this report will be replaced by a sectorised antenna link in the future by NGED. We advise that Pager Power liaise with JRC to coordinate build dates for the Cwm Risca site. After sectorisation of the links listed in Table 3 have been completed, Turbine T1 (T03) will be able to be built with minimal impact to the surrounding links.

Failing this, Turbine T1 (T03) should be relocated to an area outside the provided Exclusion Zone shown in Figure 2.

Other mitigation solutions do not seem suitable for this development due to the number of links requiring changes.

When this proposal is submitted to planning, provided the turbine location remains outside the exclusion zone indicated above, and provided the turbine parameters have not changed, our recommendation to the link operator would be to clear this particular development. We recommend that you include a copy of this report with your submission.

However, final decision on acceptance would be with the link operator, NGED.

Notes and Caveats:

- *This analysis only applies to the turbine(s) and link(s) detailed above and is correct as per the date in the footer*
- *Any changes to turbine parameters (hub/ tip height, blade size) or changes to the turbine location outside the specified micro-siting allowance will invalidate the conclusions in this report*

ANNEX B – AIRWAVE REPORT

The Airwave Mynydd ty-Talwyn Wind Farm Interference-Analysis_06052025 is presented in the following pages.



AIRWAVE

a Motorola Solutions Company

Motorola Solutions

Nova South
160 Victoria Street
London
SW1E 5LB
United Kingdom

Mynydd ty-Talwyn Wind Farm

Airwave network interference assessment

Report reference: Mynydd ty-Talwyn Wind Farm

Customer : Pager Power

Issue date : 06/05/2025

Prepared by : Olusegun Akinbo

Mynydd ty-Talwyn Wind Farm

Page 1 of 4

Development and Developers Details

Applicant Information

Name:	Pager Power
Address:	Stour Valley Business Centre, Sudbury, Suffolk, UK.
Postcode:	CO10 7GB
Contact name:	Abdul Wadud
Contact No:	01787 319001
Email Address:	abdul@pagerpower.com
Name of development:	Mynydd ty-Talwyn
Location of development	Wind Farm Reference ID : 12169

Technical Information

Number of Turbines on the development 6

Airwave's network interference assessment

Assessment Completed by: Olusegun Akinbo
Transmission Design Authority
Date of Assessment : 06-05-2025

Design Analysis Results

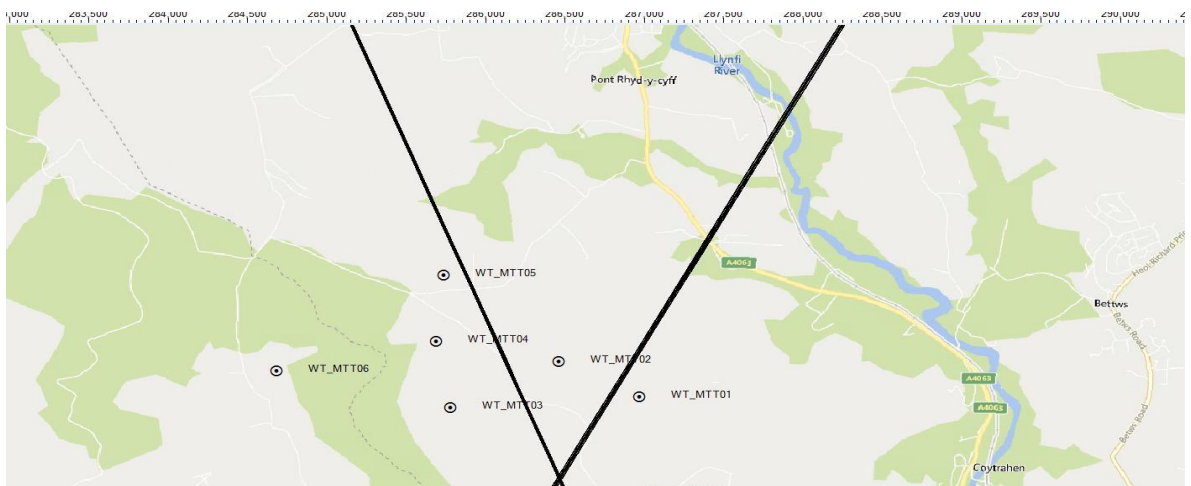
Will any of the wind turbines listed in the application in Appendix1 with respect to their positioned location coordinates cause interference to existing Airwave Microwave Radio links or Tetra Radio Network Coverage:

Y/N: No

Results/Justification

The proposed wind farm development layout at Mynydd ty-Talwyn Wind Farm will not present a problem to Airwave Microwave Radio Links or Tetra Radio Network Coverage in the region using Technical Information coordinates and the wind turbine dimensions given in Appendix 1.

Airwave have no objection to the wind farm development at Mynydd ty-Talwyn



Appendix 1

Copy of assessment application form

Wind Farm Analysis Application Form					
Please complete this form and send to Wind.farms@airwavesolutions.co.uk					
Airwave use only					
Application Reference	Invoice No	Payment received			
Applicant Information					
Name	Pager Power				
Address	Stour Valley Business Centre, Sudbury, Suffolk, UK.				
Post Code	CO10 7GB				
Contact Name	Abdul Wadud				
Contact Email	abdul@pagerpower.com				
Contact Telephone number	01787 319001				
Development Information					
Wind Farm Name	Mynydd ty-Talwyn				
Wind Farm Reference	12169				
Technical Information					
Turbine Ref No	National Grid Easting	National Grid Northing	Structure Height	Blade Radius	Comments
3	286968.11	186093.751	399.71	81	119m hub height, 200m tip height above
4	286458	186354	415.44	81	119m hub height, 200m tip height above
5	285774.376	186015.072	440.19	81	119m hub height, 200m tip height above
6	285685.58	186502.902	426.98	81	119m hub height, 200m tip height above
7	285732.007	186989	418.27	81	119m hub height, 200m tip height above
8	284680.442	186285.494	448.44	81	119m hub height, 200m tip height above



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