



Telecommunications Impact Assessment

Scout Moor II Further Environmental Information

June 2026

Telecommunications Impact Assessment

Scout Moor

Cubico Sustainable Investments Ltd

June 2026

PLANNING SOLUTIONS FOR:

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

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ADMINISTRATION PAGE

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Issue	Date	Detail of Changes
1	March 2024	Initial issue
2	April 2025	Update to include latest turbine layout
3	May 2025	Minor amendments
4	May 2026	Update to include latest turbine layout
5	June 2026	Update following consultation response

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EXECUTIVE SUMMARY

Report Overview

Pager Power has been commissioned to investigate the potential impact of a proposed wind development to be located northwest of Rochdale, UK, upon wireless communications infrastructure (point-to-point links) in the surrounding area.

The Joint Radio Company (JRC), Airwave, Virgin Media O2, MLL Telecom, Mobile Broadband Network Limited (MBNL), Atkins, Arqiva, BT, and Vodafone have been consulted as part of this assessment. Airwave have also been contacted; however, they complete their own assessment, the relevant details of which have been included in this assessment.

Overall Results

Airwave, MLL Telecom, MBNL, Vodafone and Virgin Media O2 have confirmed that they have no concerns with the proposed development.

Arqiva have provided details pertaining to their link infrastructure within the vicinity of the proposed development, which has an exclusion zone covering the northernmost section of the proposed development. Turbines T9, T11 and T16 infringe on the 100m exclusion zone requested by Arqiva. Arqiva have confirmed that it is a radio link and due to the distance of the turbines from the link ends, significant interference is not predicted. Arqiva have no objection to the proposed development.

Atkins have passed the enquiry on to United Utilities, who are yet to confirm their position on the proposed development. This report will be updated once a response is received.

BT have provided details pertaining to their link infrastructure within the vicinity of the proposed development, which have exclusion zones covering the southernmost section of the proposed development area. None of the proposed turbines infringe the exclusion zones of these links.

The JRC have provided an initial exclusion zone that covers a southern section of the site. The proposed turbines lie outside of this exclusion zone and therefore will not impact the identified JRC link.

Mitigation

Mitigation is not expected to be required following consultation with the relevant stakeholders.

An overview of possible mitigation strategies has been provided in Section 5 for reference.

LIST OF CONTENTS

Administration Page	2
Executive Summary	3
Report Overview.....	3
Overall Results.....	3
Mitigation.....	3
List of Contents	4
List of Figures.....	5
List of Tables.....	5
About Pager Power.....	6
1 Background	7
1.1 Introduction.....	7
2 Proposed Wind Development Details.....	8
2.1 Proposed Development Layout	8
3 Telecommunications Consultation Summary	9
3.1 Process	9
3.2 Consultation Overview	9
4 Technical Assessment.....	13
4.1 Methodology.....	13
4.2 Identified Telecommunications Links	15
4.3 2D Telecommunications Link Exclusion Zone Chart	15
4.4 Reflection Calculations.....	20
5 Mitigation	21
5.1 Requirement.....	21
5.2 Microwave Link Mitigation.....	21
5.3 UHF Telemetry Links	22
6 Conclusions.....	24
6.1 Overall Results.....	24
6.2 Mitigation.....	24

LIST OF FIGURES

Figure 1 Site location plan.....	8
Figure 2 Exclusion zone calculation	16
Figure 3 Telecommunications link exclusion zone chart – Stakeholder Exclusion Zones	17
Figure 4 Telecommunications link exclusion zone chart – Fresnel Zone Exclusion Zones	18
Figure 5 JRC exclusion zones	19
Figure 6 Arial and Streetview imagery of the JRC mast	20

LIST OF TABLES

Table 1 Telecommunications stakeholder consultation.....	12
Table 2 Identified telecommunications links	15

ABOUT PAGER POWER

Pager Power is a dedicated consultancy company based in Suffolk, UK. The company has undertaken projects in 64 countries within Europe, Africa, America, Asia and Oceania.

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 impact of a proposed wind development to be located northwest of Rochdale, UK, upon wireless communications infrastructure (point-to-point links) in the surrounding area.

In detail, this report contains:

- Site description;
- Stakeholder consultation to identify relevant:
 - Microwave links;
 - UHF Telemetry links.
- Technical analysis including:
 - Exclusion zone calculations (Ofcom-recommended methodology);
 - Reflection calculations (JRC recommended methodology).
- High-level overview of common mitigation options.

2 PROPOSED WIND DEVELOPMENT DETAILS

2.1 Proposed Development Layout

The proposed development redline boundary and turbine layout is shown in Figure 1 below.

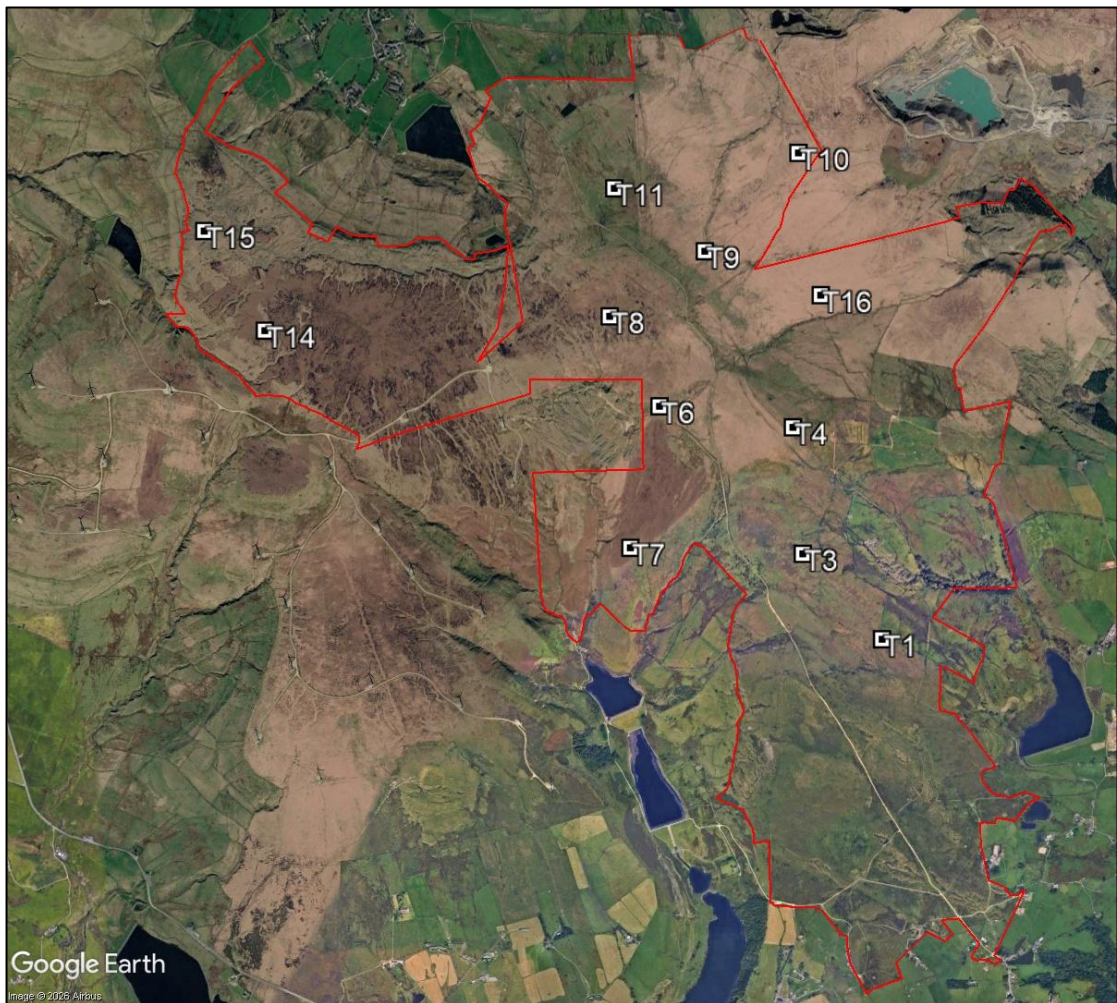


Figure 1 Site location plan

3 TELECOMMUNICATIONS 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. Since 2018, this process has been under review following GDPR requirements and has not been formally restarted¹. Therefore, consultation was undertaken directly with the most prevalent operators² in order to obtain link details. At the time of writing, no further information from Ofcom has been made available.

3.2 Consultation Overview

Table 1 below presents a summary of the consultation to date.

Stakeholder	Summary
Joint Radio Company (JRC)	23/02/2024: Link details requested. 26/02/2024: Response received. The JRC have shown an initial exclusion zone which may be reduced with a further more detailed assessment. 29/04/2026: New turbine layout sent. 04/05/2026: Response received. No objection.
Mobile Broadband Network Limited (MBNL) ³	23/02/2024: Link details requested. 05/03/2024: Response received. No objection⁴. 29/04/2026: New turbine layout sent. 30/04/2026: Response received. No objection.

¹ To Pager Power's knowledge.

² Based on Pager Power's experience and contacts database.

³ Mobile Broadband Network Limited (MBNL) is a joint venture between Everything Everywhere (EE) and Three.

⁴ Mast in vicinity of sight, but no link across site and turbines not within range of mast.

Stakeholder	Summary
MLL Telecom	23/02/2024: Link details requested. 23/02/2024: Response received. No objection. 29/04/2026: New turbine layout sent. 05/05/2026: Response received. No objection.
Virgin Media O2	23/02/2024: Link details requested. 29/02/2024: Response received. No objection⁵. 29/04/2026: New turbine layout sent. 01/05/2026: Response received. No objection.
Atkins & United Utilities	23/02/2024: Link details requested. 10/03/2024: Enquiry passed on to United Utilities. 28/03/2024: Follow up email sent. 24/04/2025: New turbine layout sent. 26/05/2025: Follow up email sent. 29/04/2026: New turbine layout sent. No response received to date.

⁵ No links in vicinity of development.

Stakeholder	Summary
Arqiva	23/02/2024: Link details requested. 26/02/2024: Response received. Link details provided. 24/04/2025: New turbine layout sent. 26/02/2024: Response received. Link details provided. 29/04/2026: New turbine layout sent. 11/02/2026: Response received. Link details provided. T9, T11 and T16 infringe 100m requested exclusion zone. 27/05/2026: Queried why link details were not provided in previous consultation. 01/06/2026: Response received. Arqiva confirmed that the link was there previously. Due to the link being a radio FM link, and the distances of the turbines from the link ends, Arqiva do not predict significant interference to occur. No objection.
Vodafone	23/02/2024: Link details requested. 25/04/2023: Response received. No objection. 29/04/2026: New turbine layout sent. 30/04/2026: Response received. No objection.

Stakeholder	Summary
Airwave	23/02/2024: Link details requested. 23/02/2024: Details for application received. 05/03/2024: Invoice paid by Pager Power. 11/03/2024: Assessment received. No objection. 29/04/2026: New turbine layout sent. 20/05/2026: Response received. No objection.
BT	23/02/2024: Link details requested. 28/02/2024: Response received. Objection. BT have one link nearby, link details not provided. 20/03/2024: Follow up for link details sent. 25/03/2024: Follow up for link details sent. 26/03/2024: Response received. 29/04/2026: New turbine layout sent. 20/05/2026: Response received. No objection.

Table 1 Telecommunications stakeholder consultation

4 TECHNICAL ASSESSMENT

4.1 Methodology

Microwave and UHF⁶ 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 2-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.

4.1.1 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.

4.1.2 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 boresight⁷. 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 wind turbine upon microwave links and the 60% of the First Fresnel zone when assessing UHF links.

⁶ Ultra-High Frequency

⁷ This is the straight line between the two antennae.

4.1.3 Reflections – UHF Links

Reflection effects occur when the transmitted signal from one link end is reflected by wind turbine towards the other link end. This causes interference to the signal. In order to establish whether a wind development will cause interference it is necessary to calculate the Carrier to Interference Ratio (CIR), also known as the Wanted to Unwanted Ratio. This quantifies the strength of the direct (wanted) signal between the link ends relative to the interfering (unwanted) reflection from the wind turbine.

The JRC considers⁸ the minimum CIR that must be maintained by a link to be 38 decibels (dB). This value can be calculated for each turbine in isolation and adjusted to account for cumulative effects. The JRC advises that this should be done by reducing the individual values by:

- $10 * \log_{10} (\text{number of turbines}).$

Pager Power's approach for assessment is based on the JRC's methodology. Because the calculation is sensitive to the intervening terrain between the turbine and each link end, it must be undertaken for individual locations. This is why there is not a fixed exclusion zone for reflection issues.

⁸ JRC, December 2014, Calculation of Wind Turbine clearance zones for JRC managed fixed services with particular reference to UHF (460 MHz) Telemetry Systems when turbine sizes and locations are accurately known, Issue 4.2, Joint Radio Company Ltd.

4.2 Identified Telecommunications Links

Table 2 below summarises the link details received from operators. Following a review of the available imagery, a mast in the correct position for the exclusion zone provided by the JRC (Figure 5) has been identified, as shown in Figure 6. No additional links have been identified following a review of the OFCOM Database.

Operator	Type	Link ID / Ref	Frequency / Buffer Distance	A End ⁹	B End
Arqiva	UHF	Holme Moss to Haslington	100m	409490E 404070N	379540E 423600N
Arqiva	UHF	Not provided	100m	366050E 414460N	391530E 417200N
		Not provided			395050E 416640N
JRC	Not provided	Not provided	Not provided	387237E 415649N	398339E 396370N
BT	UHF	Not Provided	100m	315460E 209146N	312740E 204303N

Table 2 Identified telecommunications links

4.3 2D Telecommunications Link Exclusion Zone Chart

The 2D exclusion zone for each microwave communications link is defined by the second Fresnel zone radius [B], rotor radius [A/2], and additional 25-metre buffer zone [E]. This is shown in Figure 2 below. A 250-metre exclusion zone is applied to microwave link masts and an indicative 500-metre exclusion zone is applied to UHF link masts.

⁹ The JRC and Airwave have not provided any link end information, the information used within the assessment has been extrapolated from the Ofcom database.

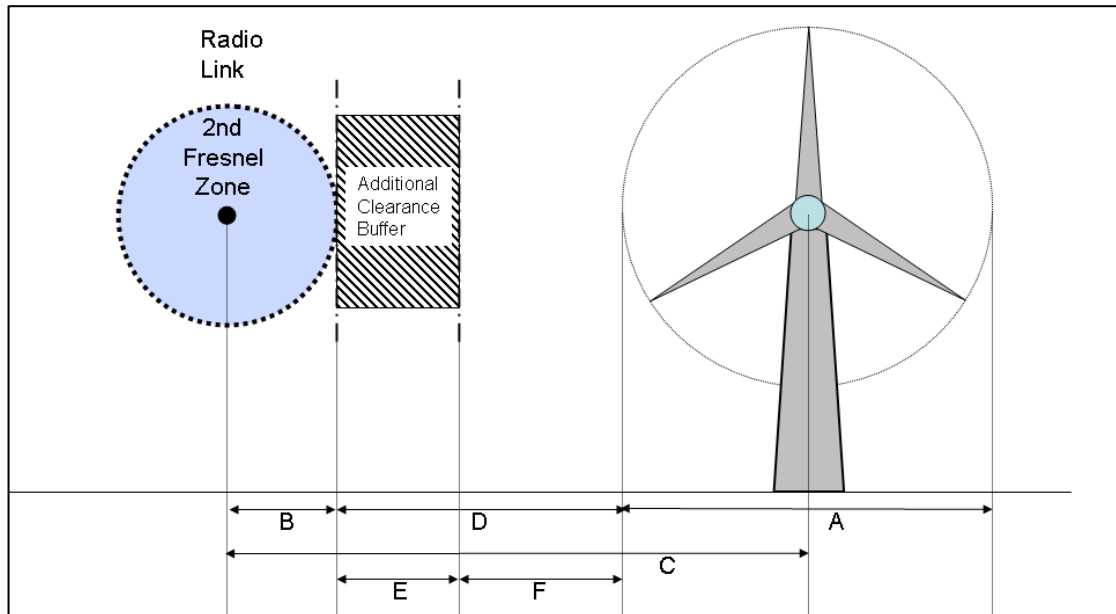


Figure 2 Exclusion zone calculation

Figures 3 and 4 on the following page show the telecommunications link exclusion zone chart for the JRC, BT, and Arqiva links. Each exclusion zone is represented by two lines, each marking an edge of the exclusion zone. Any turbine(s) located between the lines, or within one radius of the turbine blade, would infringe the zone in two dimensions.

Figure 2 on the following page shows the telecommunications link exclusion zone chart for the Arqiva link "Holme Moss to Haslington", using the requested 100m exclusion zone, it also shows that turbines T9, T11 and T16 infringe the exclusion zone.

Figure 4 shows that the other Arqiva links cross the lower area of the proposed development boundary, and the 500m exclusion zone around the BT link end also covers the lower section of the development. The exclusion zones the JRC have provided are shown in Figure 5 on page 19, the link end has been determined from Streetview imagery, and a 500m exclusion zone for microwave links has been applied in Figure 4.

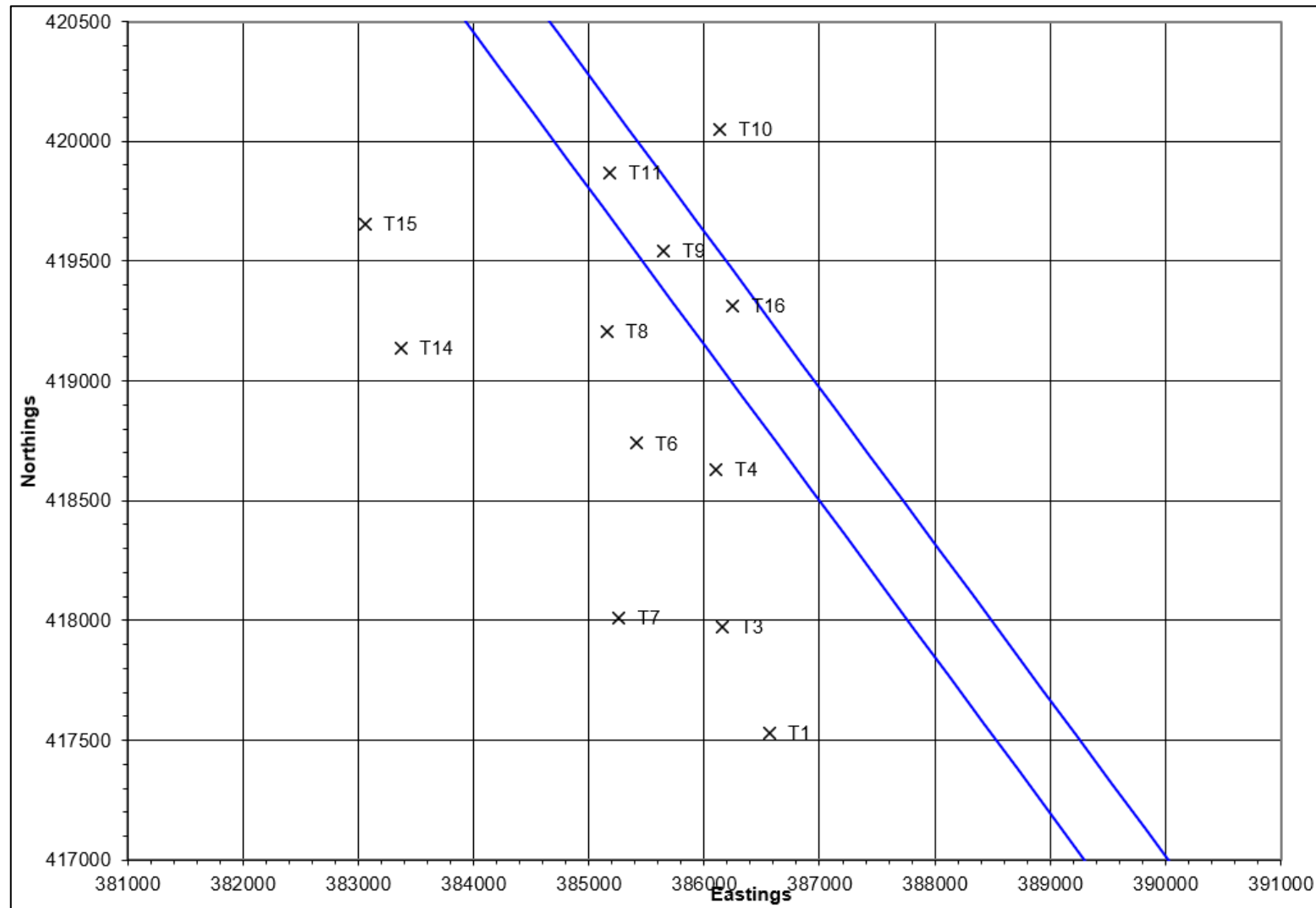


Figure 3 Telecommunications link exclusion zone chart – Stakeholder Exclusion Zones
Telecommunications Impact Assessment

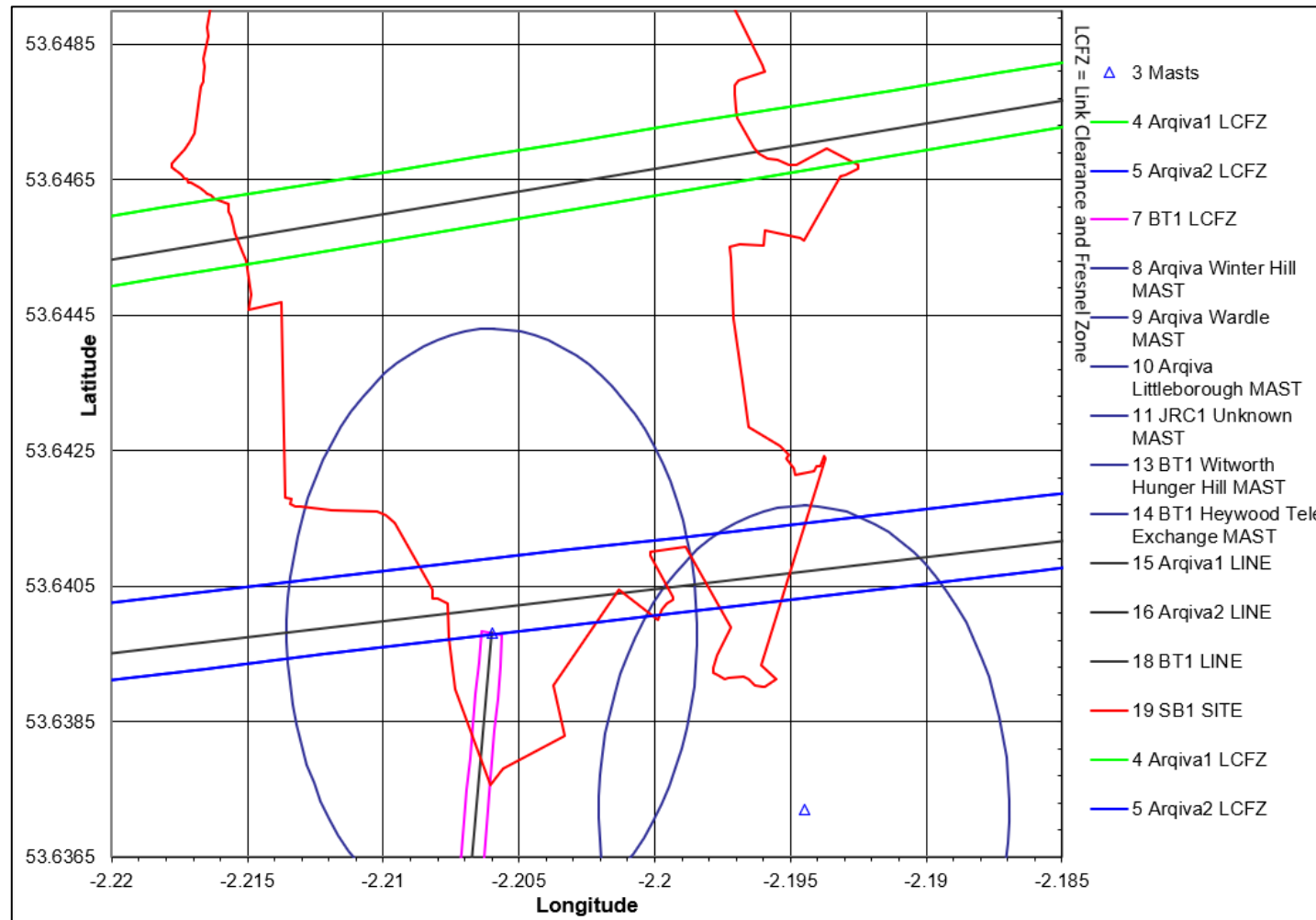


Figure 4 Telecommunications link exclusion zone chart - Fresnel Zone Exclusion Zones

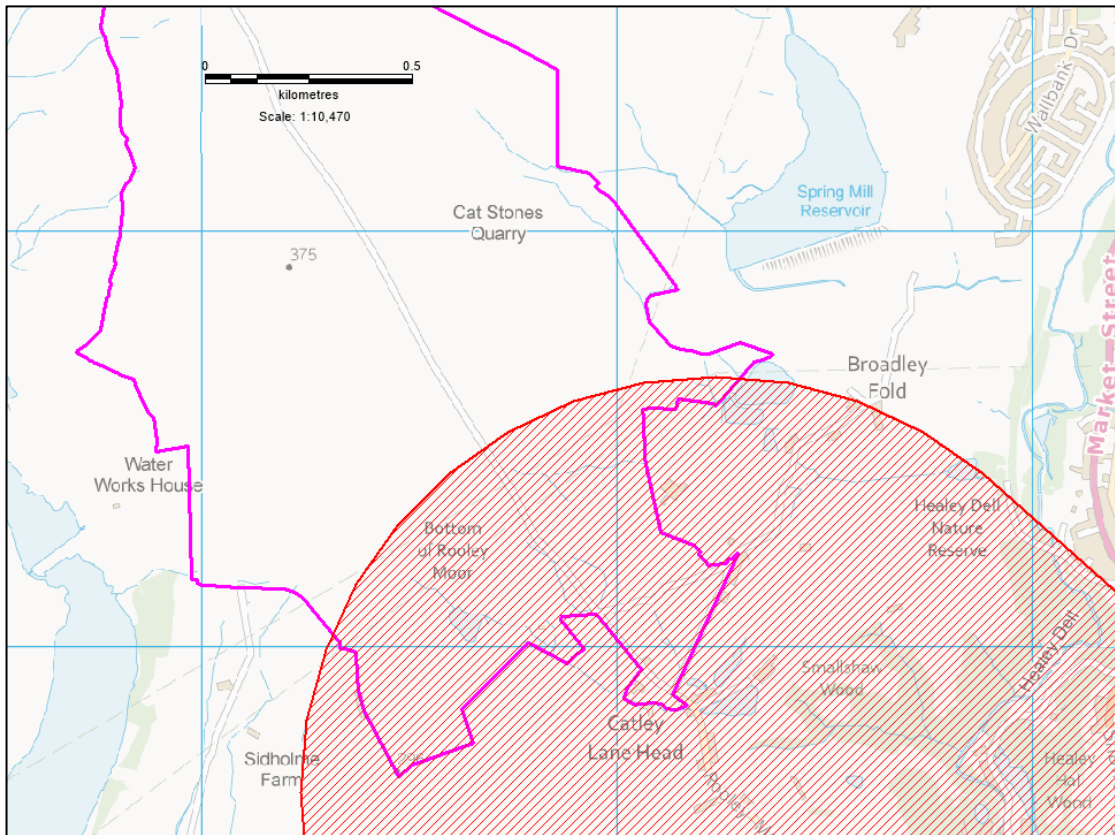


Figure 5 JRC exclusion zones

Figure 6 below show the aerial and Streetview imagery of the mast determined to be identified by the JRC.



Figure 6 Aerial and Streetview imagery of the JRC mast

4.4 Reflection Calculations

This report has not carried out any reflection calculations because the wind turbines are located over 1km from the closest UHF link, which is the distance in which turbines are typically assessed for reflection effects.

5 MITIGATION

5.1 Requirement

Mitigation is likely to be required for the “Holme Moss to Haslington” link. The following mitigation options are provided for reference.

5.2 Microwave Link Mitigation

5.2.1 Overview

The recommended solutions to consider for microwave communications links include:

- Micrositing / Layout Optimisation;
- Re-networking of the link via existing telecommunications sites;
- Use of a leased line.

Further information regarding these options is given below. Other options that can be considered are:

- Construction of a new telecommunications site for the purpose of re-networking solution;
- Use of an alternative technology such as a satellite link.

These options are less likely to be feasible and are not discussed in detail. They could be explored if an impact could not be mitigated by other means.

5.2.2 Micrositing / Layout Optimisation

This is potentially the simplest solution, depending on the available site area.

Ensuring that replanted turbines remain outside the exclusion zones associated with the microwave links and remain more than 250 metres from a microwave link end is likely to remove any potential impact.

5.2.3 Re-networking Solution

In some cases, it is possible to re-network a microwave link via an existing telecommunications site that lies away from the wind farm.

This involves adding an extra node on the link path, so that instead of the signal being sent from End A to End B, it is sent from End A to a re-networking site, and from the re-networking site to End B.

Implementation of such a solution requires identification of a suitable re-networking site, and assessment of the intervening terrain to ensure the appropriate Fresnel zone would not be infringed by terrain for the re-networked link.

The costs and timescales associated with such a solution are variable, however it is likely to be more cost-effective and have a shorter timescale than construction of a new telecommunications site.

5.2.4 Use of a Leased Line

In some cases, it is possible to replace the wireless link with a leased line between the link ends, thereby avoiding potential interference due to the wind development.

The feasibility of such a solution is dependent on the accessibility of each link end with regard to installation of a leased line.

The costs and timescales of the solution are variable and dependent on the individual site locations and the distance between them.

5.3 UHF Telemetry Links

5.3.1 Overview

Three of the most common and cost-effective mitigation options for UHF telemetry links that are affected by wind turbines are:

- Micrositing / Layout Optimisation;
- Use of an alternative scanner;
- Replacement of the UHF telemetry link with a microwave link.

Further information regarding these options is given below. Other options that can be considered are:

- Use of a leased line or fibre optic connection;
- Construction of a new scanning station;
- Use of an alternative technology such as a satellite link.

These options are less likely to be feasible and are not discussed in detail. They could be explored if an impact could not be mitigated by other means.

5.3.2 Micrositing / Layout Optimisation

This is potentially the simplest solution, depending on the available site area. Relocation of any turbines that have the largest interference contribution could prevent any impacts on the link.

Relocating problem turbines away from the link paths may be sufficient to overcome the operator's concerns. Ensuring that replanted turbines remain more than 500 metres from a UHF link end is likely to remove any potential impact.

5.3.3 Use of an Alternative Scanner

In some cases, it is possible to direct the outstations to an alternative scanner. Discussions with the link operator would be required to establish the suitability of such a solution.

5.3.4 Increasing Link Elevation

It may be possible to raise the receivers/transmitters of the links, therefore allowing the link to pass over the proposed development.

5.3.5 Replacement of the UHF Link with a Microwave Link

In cases where reflection issues are the only concern, replacement of the UHF link with a microwave link. This is because microwave links are not prone to reflection issues in the way that UHF telemetry links are.

However, microwave links do require radio line of sight to operate, which UHF telemetry links do not. Therefore, detailed assessment of the technical feasibility of such a solution would be required. This would include assessment of radio line of sight between the link ends and establishment of whether the intervening terrain would obstruct the appropriate Fresnel zone.

6 CONCLUSIONS

6.1 Overall Results

Airwave, MLL Telecom, MBNL, Vodafone and Virgin Media O2 have confirmed that they have no concerns with the proposed development.

Arqiva have provided details pertaining to their link infrastructure within the vicinity of the proposed development, which has an exclusion zone covering the northernmost section of the proposed development. Turbines T9, T11 and T16 infringe on the 100m exclusion zone requested by Arqiva. Arqiva have confirmed that it is a radio link and due to the distance of the turbines from the link ends, significant interference is not predicted. Arqiva have no objection to the proposed development.

Atkins have passed the enquiry on to United Utilities, who are yet to confirm their position on the proposed development. This report will be updated once a response is received.

BT have provided details pertaining to their link infrastructure within the vicinity of the proposed development, which have exclusion zones covering the southernmost section of the proposed development area. None of the proposed turbines infringe the exclusion zones of these links.

The JRC have provided an initial exclusion zone that covers a southern section of the site. The proposed turbines lie outside of this exclusion zone and therefore will not impact the identified JRC link.

6.2 Mitigation

Mitigation is not expected to be required following consultation with the relevant stakeholders.

An overview of possible mitigation strategies has been provided in Section 5 for reference.



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