Wind Power GeoPlanner™

Microwave Study

Arkwright Summit Wind Farm LLC

Prepared on Behalf of
EDP Renewables

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COMSEARCH
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Table of Contents

1. Introduction - 1 -

2. Project Overview - 1 -

3. Fresnel Zone Analysis - 2 -

4. Conclusion - 5 -

5. Contact - 5 -

1. Introduction

Microwave bands that may be affected by the installation of wind turbine facilities operate over a wide frequency range (900 MHz – 23 GHz). Comsearch has developed and maintains comprehensive technical databases containing information on licensed microwave networks throughout the United States. These systems are the telecommunication backbone of the country, providing long-distance and local telephone service, backhaul for cellular and personal communication service, data interconnects for mainframe computers and the Internet, network controls for utilities and railroads, and various video services. This report focuses on the potential impact of wind turbines on licensed, proposed and applied non-federal government microwave systems.

2. Project Overview

Project Information

Name: Arkwright Summit Wind Farm LLC
County: Chautauqua
State: New York

Number of Turbines: TBD
Blade Diameter: 110 meters
Hub Height: 93 meters

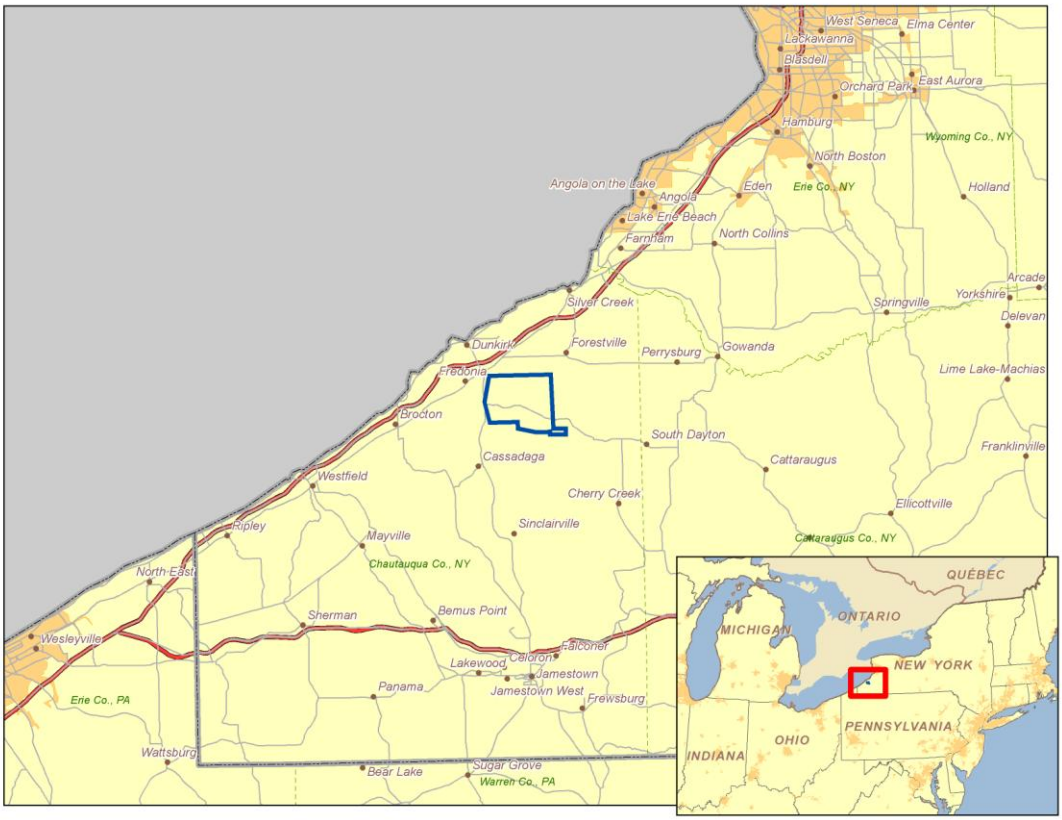


Figure 1: Area of Interest

3. Fresnel Zone Analysis

Methodology

Our obstruction analysis was performed using Comsearch's proprietary microwave database, which contains all non-government licensed, proposed and applied paths from 0.9 - 23 GHz[1]. First, we determined all microwave paths that intersect the area of interest[2] and listed them in Table 1. These paths and the area of interest that encompasses the planned turbine locations are shown in Figure 2.

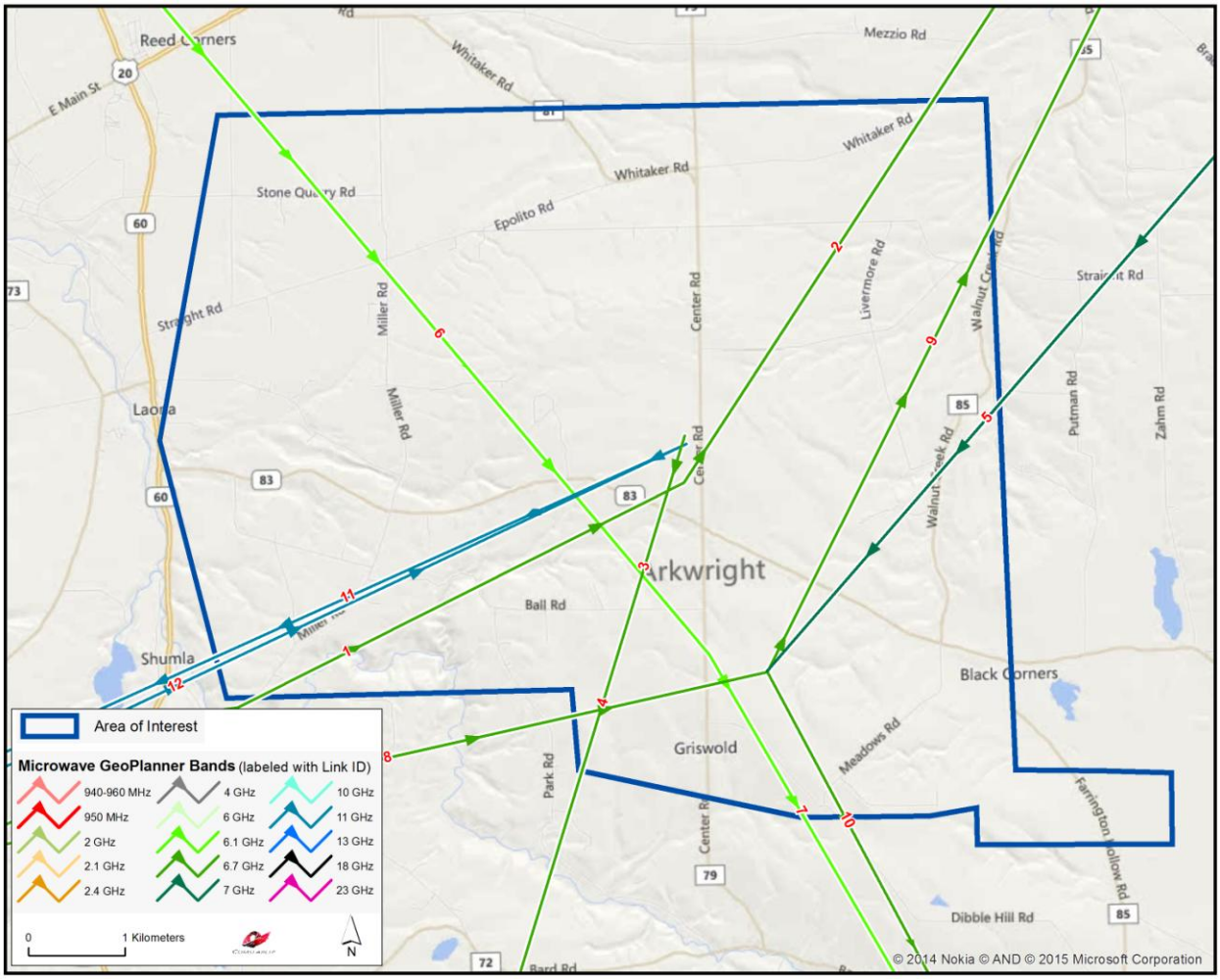


Figure 2: Microwave Paths that Intersect the Area of Interest

[1] Please note that this analysis does not include unlicensed microwave paths or federal government paths that are not registered with the FCC.

[2] We use FCC-licensed coordinates to determine which paths intersect the area of interest. It is possible that as-built coordinates may differ slightly from those on the FCC license.

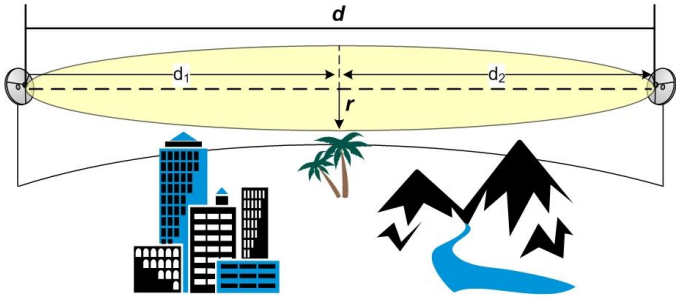
ID	Status	Callsign 1	Callsign 2	Band	Path Length (km)	Licensee
1	Licensed	WBB741	WBB742	Upper 6 GHz	35.23	Norfolk Southern Railway
2	Licensed	WBB742	WBH542	Upper 6 GHz	64.37	Norfolk Southern Railway
3	Licensed	WMK453	WMK454	Lower 6 GHz	27.63	New Cingular Wireless PCS, LLC (NY)
4	Licensed	WMK453	WMK454	Upper 6 GHz	27.63	New Cingular Wireless PCS, LLC (NY)
5	Licensed	WPNF351	RXONLY	7 GHz	55.63	FAITH BROADCASTING NETWORK, INC.
6	Licensed	WPRR465	WPRR472	Lower 6 GHz	12.78	CHAUTAUQUA COUNTY
7	Licensed	WPRR472	WPRR461	Lower 6 GHz	12.39	CHAUTAUQUA COUNTY
8	Licensed	WQFB456	WQFB461	Upper 6 GHz	13.36	New York State Office for Technology SWN
9	Licensed	WQFB461	WQFB462	Upper 6 GHz	20.21	New York State Office for Technology SWN
10	Licensed	WQFB461	WQFN592	Upper 6 GHz	11.94	New York State Office for Technology SWN
11	Licensed	WQPA475	WQPA327	11 GHz	19.97	Conterra Ultra Broadband, LLC
12	Licensed	WQSH454	WQSH456	11 GHz	10.49	Sprint Spectrum L.P.

Table 1: Summary of Microwave Paths that Intersect the Area of Interest

(See enclosed mw_geopl.xlsx for more information and GP_dict_matrix_description.xls for detailed field descriptions)

Next, we calculated a Fresnel Zone for each path based on the following formula:

$$r \cong 17.3\sqrt{\frac{n}{F_{GHz}}\left(\frac{d_1 d_2}{d_1 + d_2}\right)}$$



Where,

r = Fresnel Zone radius at a specific point in the microwave path, meters
n = Fresnel Zone number, 1
F_{GHz} = Frequency of microwave system, GHz
d_1 = Distance from antenna 1 to a specific point in the microwave path, kilometers
d_2 = Distance from antenna 2 to a specific point in the microwave path, kilometers

The calculated Fresnel Zone shows the narrow area of signal swath and is calculated for each microwave path in the project area. In general, this is the area where the planned wind turbines

should be avoided, if possible. A depiction of the individual Fresnel Zones is shown in Figure 3, and is also included in the shapefiles[3,4].

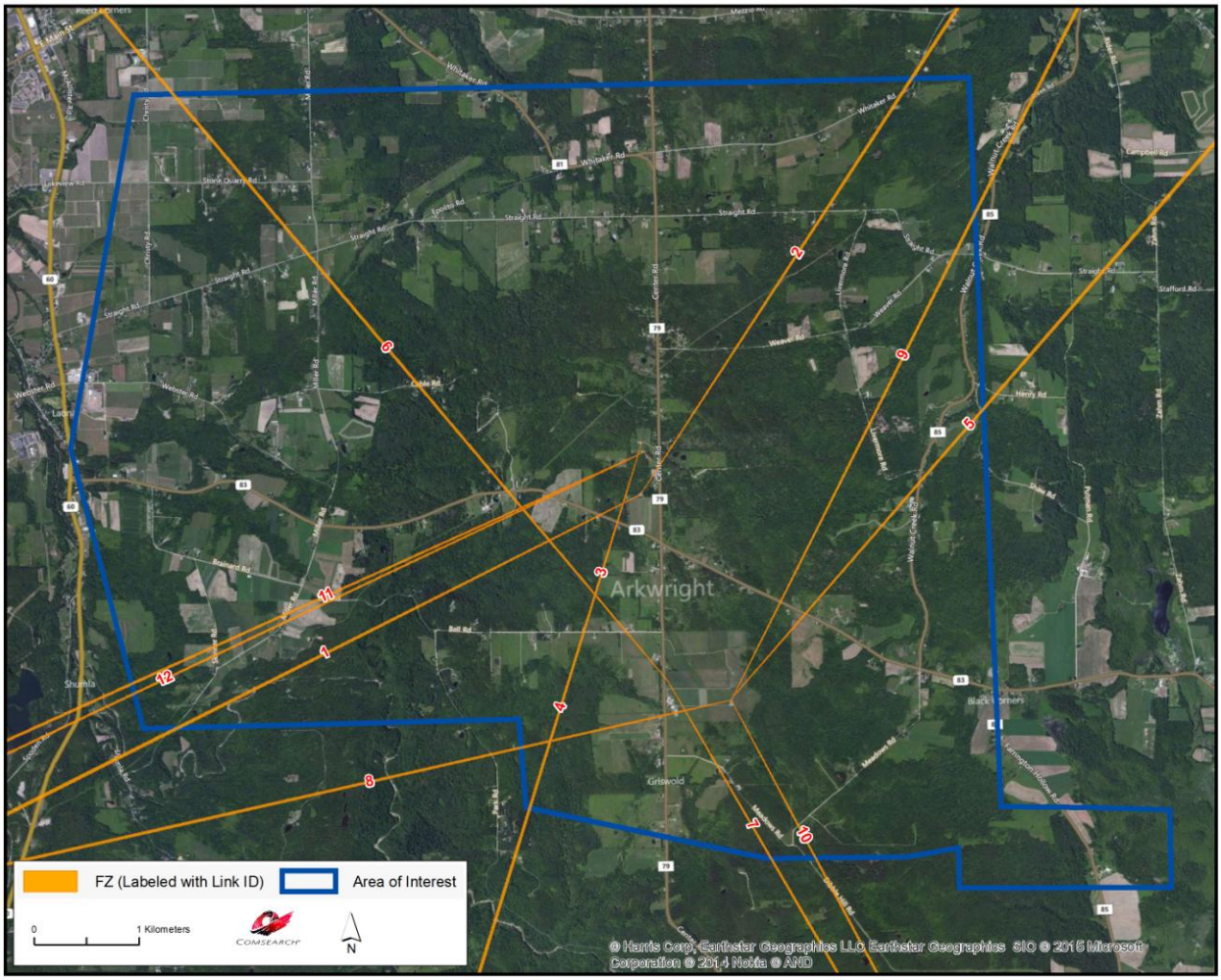


Figure 3: Fresnel Zones in the Area of Interest

[3] The ESRI® shapefiles enclosed are in NAD 83 UTM Zone 17 projected coordinate system.

[4] Comsearch makes no warranty as to the accuracy of the data included in this report beyond the date of the report. The data provided in this report is governed by Comsearch's data license notification and agreement located at http://www.comsearch.com/files/data_license.pdf.

Discussion of Potential Obstructions

Total Microwave Paths	Paths with Affected Fresnel Zones	Total Turbines	Turbines intersecting Fresnel Zones
12	N/A	N/A	N/A

For this project, turbine locations were not provided; thus we could not determine if any potential obstructions exist between the planned wind turbines and the incumbent microwave paths. If the latitude and longitude values for turbine locations are provided, Comsearch can identify where a potential conflict might exist.

4. Conclusion

Our study identified 12 microwave paths intersecting the Arkwright Summit Wind Farm project area. The Fresnel Zones for these microwave paths were calculated and mapped. We recommend that all turbines be sited in locations that will not obstruct the Fresnel Zones.

5. Contact

For questions or information regarding the Microwave Study, please contact:

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