APPENDIX M – INTERFERENCE STUDIES

Wind Power GeoPlanner™

Doppler and NEXRAD Weather Radar Study

Panther Grove 2

Prepared on Behalf of
Panther Grove 2 LLC

September 11, 2024

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1. Introduction

The purpose of this document is to describe the research, calculations, and analysis performed to assess the impact of the proposed Panther Grove 2 wind energy project on the operation of Doppler Weather Radar Systems (owned and operated by television stations and commercial interests) and the NEXRAD radars (jointly operated by the National Weather Service (NWS), the Federal Aviation Administration (FAA), and the U.S. Air Force) within the vicinity of the project. This study was performed for Panther Grove 2 LLC.

2. Project Area

The location of the Panther Grove 2 energy project in Livingston County, Illinois is shown in Figure 1. The proposed turbines will have a maximum hub height of 113 meters and a rotor diameter of 163 meters, giving the structures an overall maximum height of 194.5 meters above ground level. At the time of this study, there are 104 turbines proposed for the Panther Grove 2 wind project. Table A-1 in the appendix lists these turbines and their coordinates within the project area. A detailed view is provided in Figure 2.

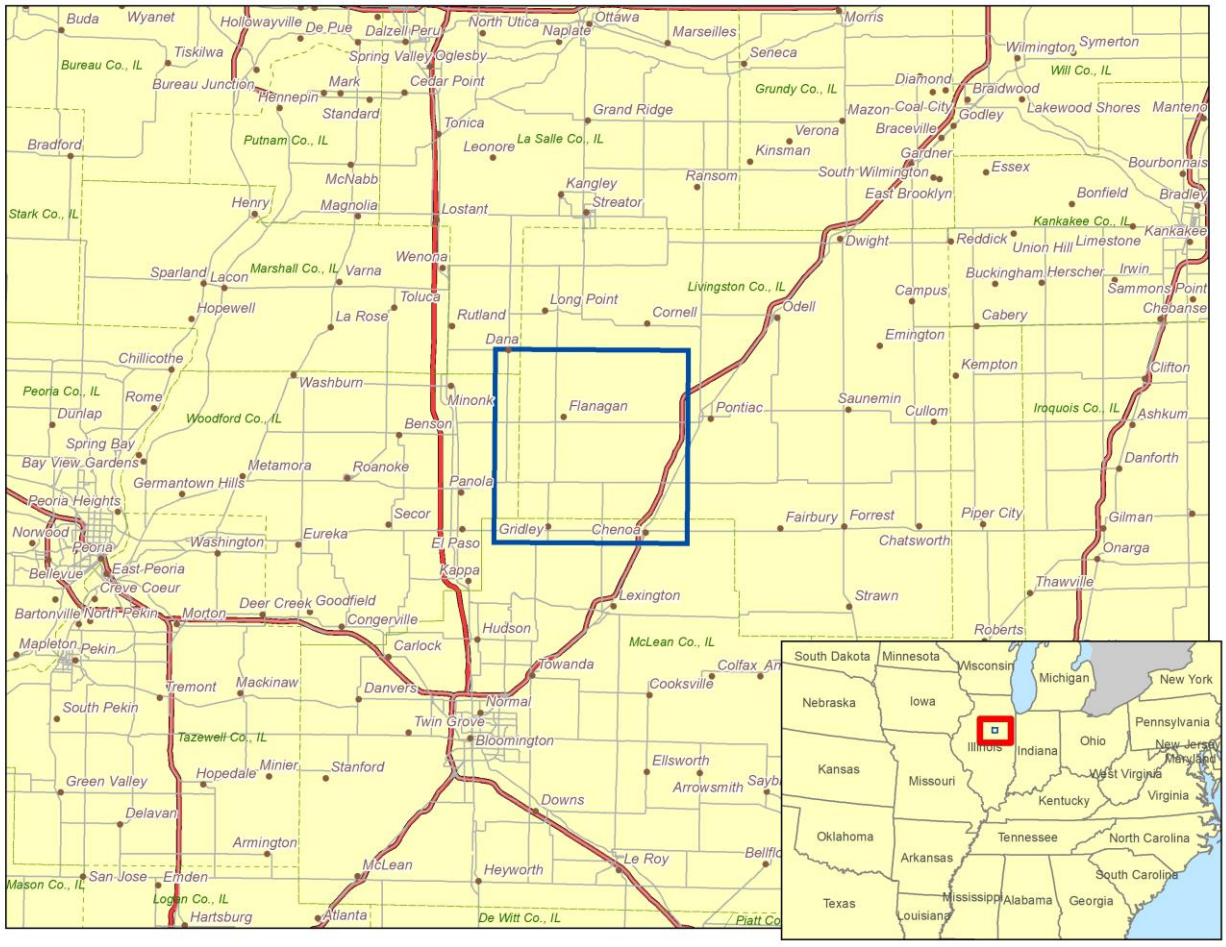

Figure 1: Location of Panther Grove 2 in the State of Illinois

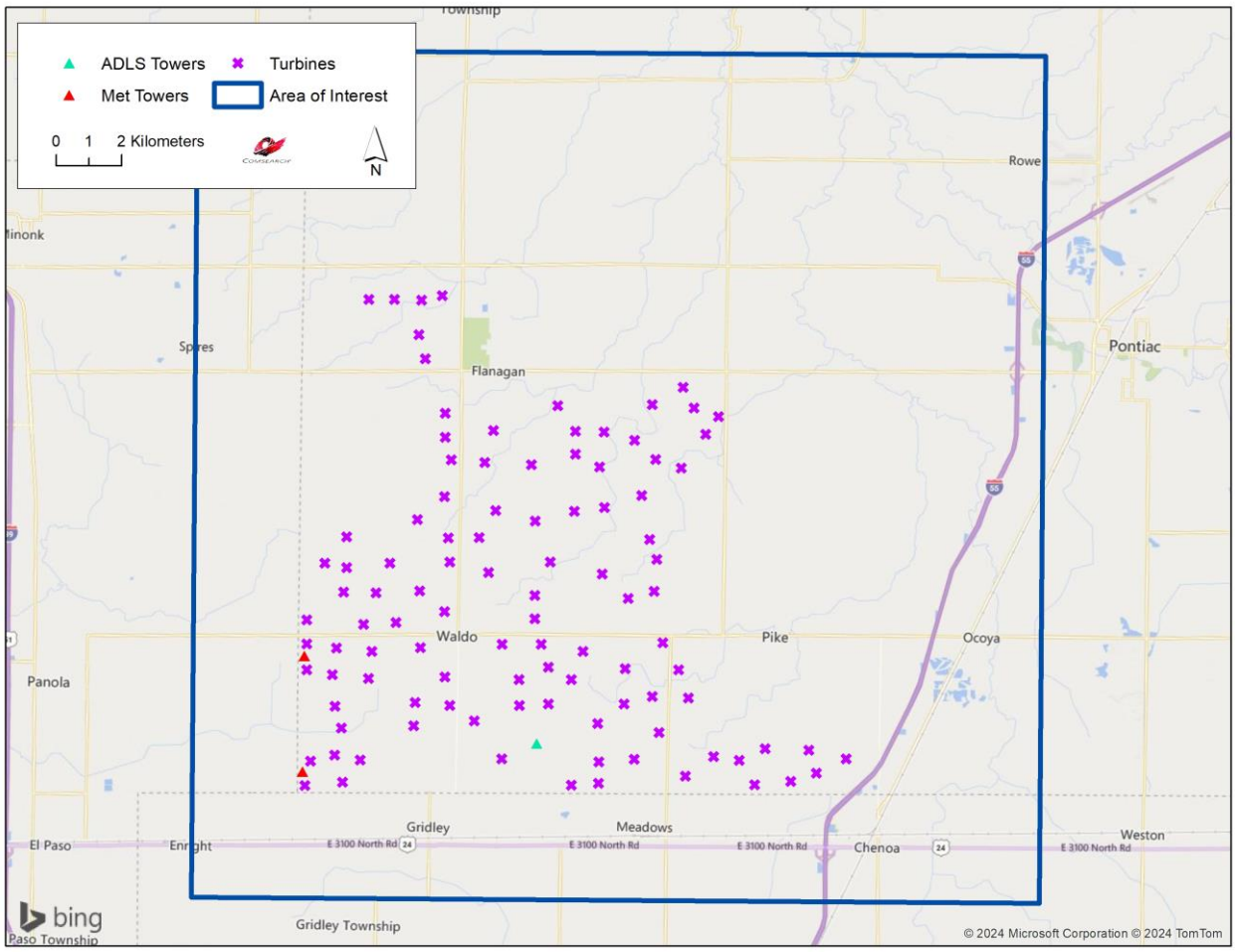

Figure 2: Location of Turbines within Panther Grove 2 Wind Project Area

3. Technical Data

Based on a preliminary analysis of the terrain within the vicinity of the project and taking into account the maximum height of the proposed wind turbines, a reasonable search radius for radar systems was established at 250 kilometers from the center of the project area. Tables 1 and 2 contain the technical parameters of the commercial Doppler radar systems located within 250 kilometers of the project, including ownership and geographical data[1]. A depiction of the location of the Doppler radar systems with respect to the wind farm appears in Figure 3. Table 3 and Figure 4 contains the information on the NEXRAD radar systems found with 250 kilometers.

ID	Call Sign	Frequency (MHz)	Ground Elevation (m)	Antenna Height (m)	Output Power (Watts)	Distance to Nearest Turbine (km)
1	WQVG967	2900.0-2950.0	270.0	41.5	1000000	120.95
2	WPRU946	5350.0-5460.0	217.3	15.2	257	156.55
3	WNLR207	9300.0-9500.0	186.0	11.0	6000/7500	157.01
4	WPPH816	5350.0-5460.0	168.0	21.0	200	204.12
5	KQU753	5350.0-5460.0	218.0	49.1	220	244.51

Table 1: Technical Data for Commercial Interest and Television Station Doppler Radar Systems within 250 Kilometers of the Panther Grove 2 Wind Project Area

ID	Call Sign	Owner- Operator	Location	Latitude (NAD83)	Longitude (NAD83)
1	WQVG967	WLS Television, Inc.	LILY LAKE, IL	41.937500	-88.477917
2	WPRU946	Lafayette TV License Company, LLC	WEST LAFAYETTE, IN	40.456444	-86.925556
3	WNLR207	Indiana, State of - Purdue University - W Laf	WEST LAFAYETTE, IN	40.416417	-86.933056
4	WPPH816	Nexstar Media Inc.	FARMERSBURG, IN	39.242528	-87.391417
5	KQU753	Scripps Broadcasting Holdings LLC	INDIANAPOLIS, IN	39.786167	-86.155000

Table 2: Location and Ownership of Commercial Interest and Television Station Doppler Radar Systems within 250 Kilometers of the Panther Grove 2 Wind Project Area

[1] 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.

ID	WBAN #	Station ID	Station Name	Latitude (NAD83)	Longitude (NAD83)	Elevation (ft)	Tower Height (m)	Distance to Nearest Turbine (km)
1	4833	KILX	Lincoln, IL	40.15055556	-89.33694444	582	30	75.64
2	4831	KLOT	Chicago, IL	41.60472222	-88.08472222	663	20	101.11
3	94982	KDVN	Davenport, IA	41.61166667	-90.58083333	754	20	161.58
4	4834	KMKX	Milwaukee, WI	42.96777778	-88.55056556	958	10	232.22
5	93819	KIND	Indianapolis, IN	39.70750000	-86.28027778	790	20	239.29

Table 3: Location and Technical Data for NEXRAD Radar Systems within 250 Kilometers of the Panther Grove 2 Wind Project Area

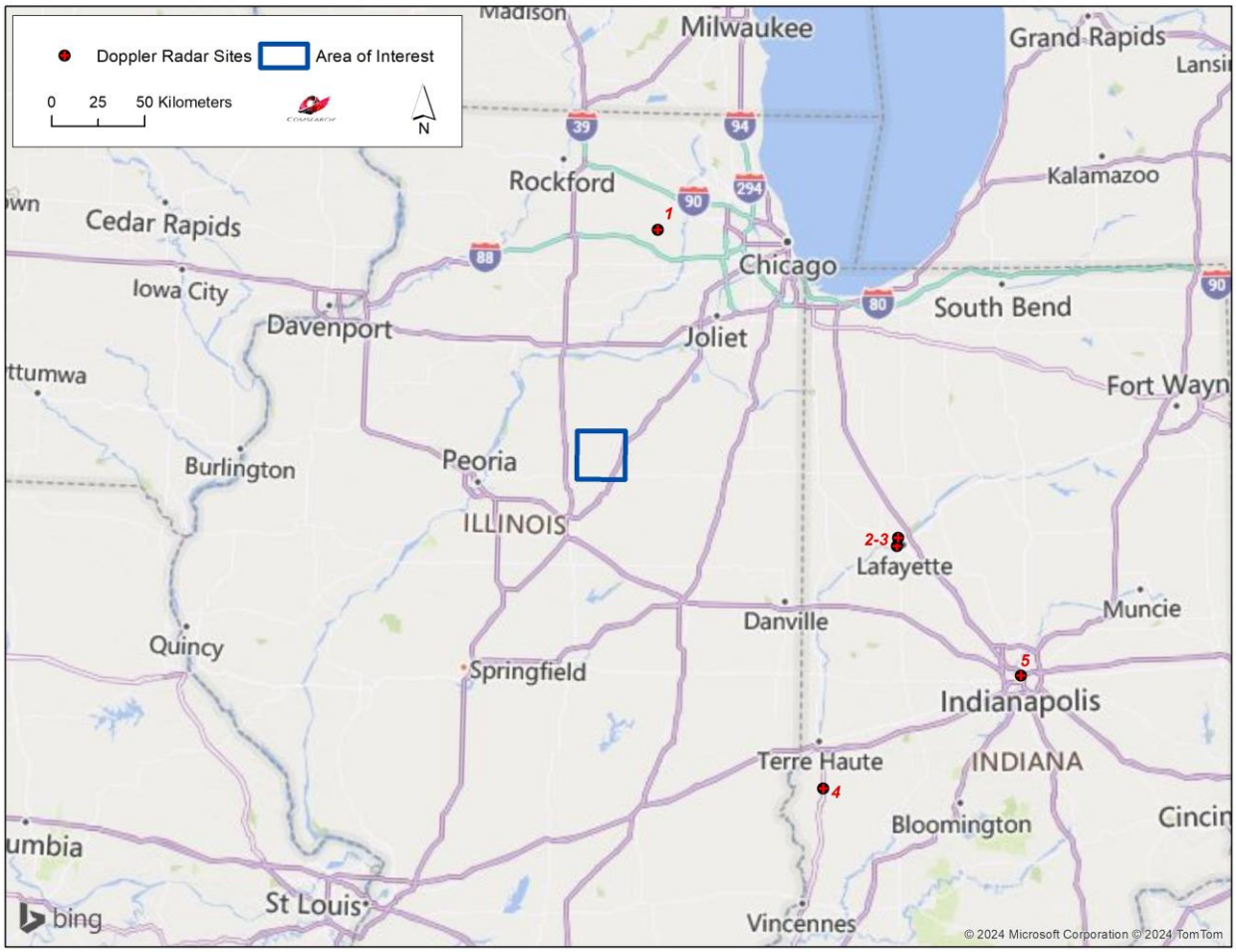

Figure 3: Location of Doppler Radar Systems within 250 Kilometers of the Panther Grove 2 Wind Project Area

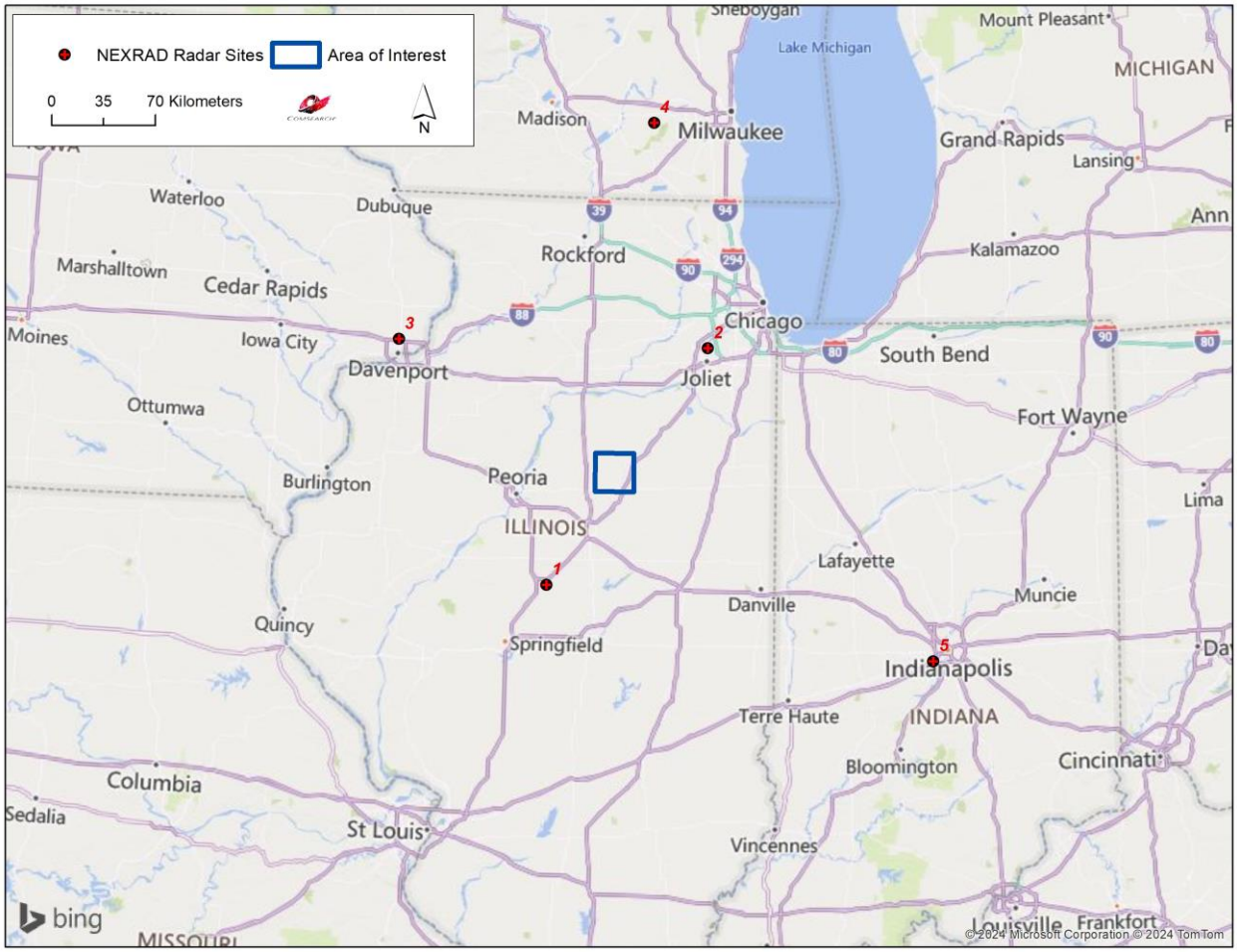

Figure 4: Location of NEXRAD Radar Systems within 250 Kilometers of the Panther Grove 2 Wind Project Area

4. Impact Assessment

The technical approach to determine the potential impact of the turbines on the radar systems in the area is to calculate whether the wind turbines are in line-of-sight (LOS) of the radar systems. The wind turbines of the Panther Grove 2 have the potential to block radar coverage and produce false targets if the turbines are in line-of-sight of the radar systems' transmitted signals.

To verify the presence or absence of LOS conditions between the Panther Grove 2 energy project and the radar systems identified in Section 3, LOS coverage plots were generated for each of the radar systems. These plots identify the geographical regions that have LOS to a given radar by taking into account the height of the radar antenna, the maximum height of the wind turbine blades, the curvature of the earth, and potential refractivity in the atmosphere. The plots may be referenced in the Appendix section of this report.

According to the LOS coverage plots, the effective terrain elevations would block LOS between the antennas of all 10 radars and the wind project area. Therefore, LOS conditions would not exist between the radars and the wind turbines.

5. Conclusions

Based on the analysis described in this report, none of the five Doppler radar systems nor the five NEXRAD radar systems in the vicinity of the Panther Grove 2 could be impacted by the project's planned wind turbines.

6. Contact

For questions or information regarding the Doppler Radar Study, please contact:

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Fax:	703-726-5595
Email:	David.Meyer@CommScope.com
Web site:	www.comsearch.com

Appendix

Turbine ID	Latitude (NAD83)	Longitude (NAD83)	Ground Elevation (m)	Maximum Blade Height Above Mean Sea Level (m)
WTG T01	40.81579122	-88.91338246	229.49	423.99
WTG T02	40.80975397	-88.88671215	225.79	420.29
WTG T03	40.80893648	-88.90248019	227.84	422.34
WTG T04	40.84560415	-88.86405267	211.15	405.65
WTG T05	40.75539661	-88.92674070	219.42	413.92
WTG T06	40.80107275	-88.92743312	220.23	414.73
WTG T07	40.79450023	-88.92724296	219.95	414.45
WTG T08	40.76214743	-88.92488619	218.59	413.09
WTG T09	40.78726125	-88.92704544	221.16	415.66
WTG T10	40.81689250	-88.92136993	224.15	418.65
WTG T11	40.77738462	-88.91647443	218.80	413.30
WTG T12	40.79350881	-88.91646407	226.64	421.14
WTG T13	40.77141760	-88.91399244	218.04	412.54
WTG T14	40.75648715	-88.91317310	219.76	414.26
WTG T15	40.82428111	-88.91365024	226.42	420.92
WTG T16	40.76269687	-88.90698936	219.43	413.93
WTG T17	40.80898567	-88.91420644	230.11	424.61
WTG T18	40.80019033	-88.90681774	232.19	426.69
WTG T19	40.78532778	-88.90461477	220.03	414.53
WTG T20	40.88989696	-88.90745683	210.04	404.54
WTG T21	40.81724890	-88.89766676	226.31	420.81
WTG T22	40.89004127	-88.89816698	208.92	403.42
WTG T23	40.80094303	-88.89503287	230.89	425.39
WTG T24	40.77249753	-88.88781397	223.15	417.65
WTG T25	40.77888928	-88.88749728	222.90	417.40
WTG T26	40.82940334	-88.88815860	223.22	417.72
WTG T27	40.85234763	-88.87869089	212.49	406.99
WTG T28	40.88048184	-88.88898087	211.27	405.76
WTG T29	40.79409264	-88.88596040	224.65	419.15
WTG T30	40.89005011	-88.88830347	206.93	401.43
WTG T31	40.87387568	-88.88644338	211.18	405.68
WTG T32	40.84844472	-88.83124985	207.12	401.62
WTG T33	40.89134429	-88.88076723	205.07	399.57
WTG T34	40.83595812	-88.87840587	220.27	414.76

Turbine ID	Latitude (NAD83)	Longitude (NAD83)	Ground Elevation (m)	Maximum Blade Height Above Mean Sea Level (m)
WTG T35	40.80421118	-88.87751018	226.68	421.18
WTG T36	40.78618728	-88.87690750	228.11	422.60
WTG T37	40.85889422	-88.87881658	209.67	404.16
WTG T38	40.77828446	-88.87487195	231.37	425.87
WTG T39	40.81791902	-88.87597594	223.22	417.72
WTG T40	40.84617258	-88.87621522	215.04	409.54
WTG T41	40.77416816	-88.86596416	230.10	424.60
WTG T42	40.82484290	-88.86561737	222.09	416.59
WTG T43	40.81528244	-88.86191107	220.85	415.35
WTG T44	40.85444980	-88.86126363	208.75	403.25
WTG T45	40.83237686	-88.85982771	217.56	412.06
WTG T46	40.76386616	-88.85572420	232.31	426.81
WTG T47	40.79553669	-88.85635718	223.98	418.48
WTG T48	40.77876357	-88.84965694	224.83	419.33
WTG T49	40.84519940	-88.84722134	210.38	404.88
WTG T50	40.80921341	-88.84495418	218.87	413.37
WTG T51	40.80274864	-88.84477509	222.96	417.46
WTG T52	40.82969004	-88.84540322	215.76	410.26
WTG T53	40.79575467	-88.84219897	220.59	415.09
WTG T54	40.78941136	-88.83948730	221.20	415.70
WTG T55	40.77927350	-88.83917196	223.54	418.04
WTG T56	40.81848764	-88.83955540	216.67	411.17
WTG T57	40.86164056	-88.83807964	203.25	397.75
WTG T58	40.75701171	-88.83031322	230.27	424.77
WTG T59	40.83264608	-88.83118259	214.62	409.12
WTG T60	40.85468326	-88.83149286	205.40	399.90
WTG T61	40.79401480	-88.82699130	220.19	414.69
WTG T62	40.77423514	-88.82118815	220.70	415.20
WTG T64	40.75776259	-88.82043038	228.60	423.10
WTG T65	40.85466826	-88.82106444	204.82	399.32
WTG T66	40.83383449	-88.82041105	211.49	405.99
WTG T67	40.78947340	-88.81166083	215.61	410.11
WTG T68	40.76457492	-88.80767890	224.12	418.62
WTG T69	40.80885051	-88.81101422	216.25	410.75
WTG T70	40.77968847	-88.81180963	219.21	413.71
WTG T71	40.85259220	-88.80989183	204.13	398.63

Turbine ID	Latitude (NAD83)	Longitude (NAD83)	Ground Elevation (m)	Maximum Blade Height Above Mean Sea Level (m)
WTG T72	40.83735297	-88.80689158	208.33	402.83
WTG T73	40.82528654	-88.80375353	211.08	405.58
WTG T74	40.86252469	-88.80376709	201.73	396.23
WTG T75	40.81105042	-88.80168432	213.57	408.07
WTG T76	40.81982599	-88.80098510	210.62	405.12
WTG T77	40.77208191	-88.79881808	218.42	412.92
WTG T78	40.79690015	-88.79814862	215.47	409.97
WTG T79	40.84739795	-88.80220609	204.87	399.37
WTG T80	40.78952404	-88.79227251	216.31	410.81
WTG T81	40.86744329	-88.79277047	200.95	395.45
WTG T82	40.76015425	-88.78904275	218.95	413.45
WTG T83	40.81544506	-88.82069065	213.63	408.13
WTG T84	40.78170900	-88.78854275	215.19	409.69
WTG T85	40.82455333	-88.87680327	218.09	412.59
WTG T86	40.86186957	-88.78857423	201.39	395.89
WTG T87	40.79274907	-88.90359426	222.39	416.88
WTG T88	40.85463285	-88.78414425	202.63	397.13
WTG T89	40.76367075	-88.82049685	225.34	419.84
WTG T90	40.76576848	-88.77899248	219.42	413.91
WTG T91	40.78614880	-88.83110136	219.41	413.91
WTG T92	40.85955715	-88.77967303	200.00	394.50
WTG T93	40.76485922	-88.76958498	219.17	413.66
WTG T94	40.75815429	-88.76389856	219.91	414.41
WTG T95	40.76819979	-88.76025435	216.63	411.13
WTG T96	40.78193000	-88.80154874	216.19	410.69
WTG T97	40.75929924	-88.75082654	218.44	412.94
WTG T98	40.76391236	-88.91626496	218.48	412.98
WTG T99	40.76177172	-88.74161522	215.95	410.45
WTG T100	40.84500935	-88.82236569	205.60	400.10
WTG T101	40.76799855	-88.74444366	215.10	409.60
WTG T102	40.76585067	-88.73095213	213.93	408.43
WTG T103	40.84520327	-88.79275205	204.19	398.69
WTG T104	40.78591094	-88.84996196	224.25	418.75
WTG T105	40.78606589	-88.91769586	219.75	414.25

Table A-1: Wind Turbine Coordinates

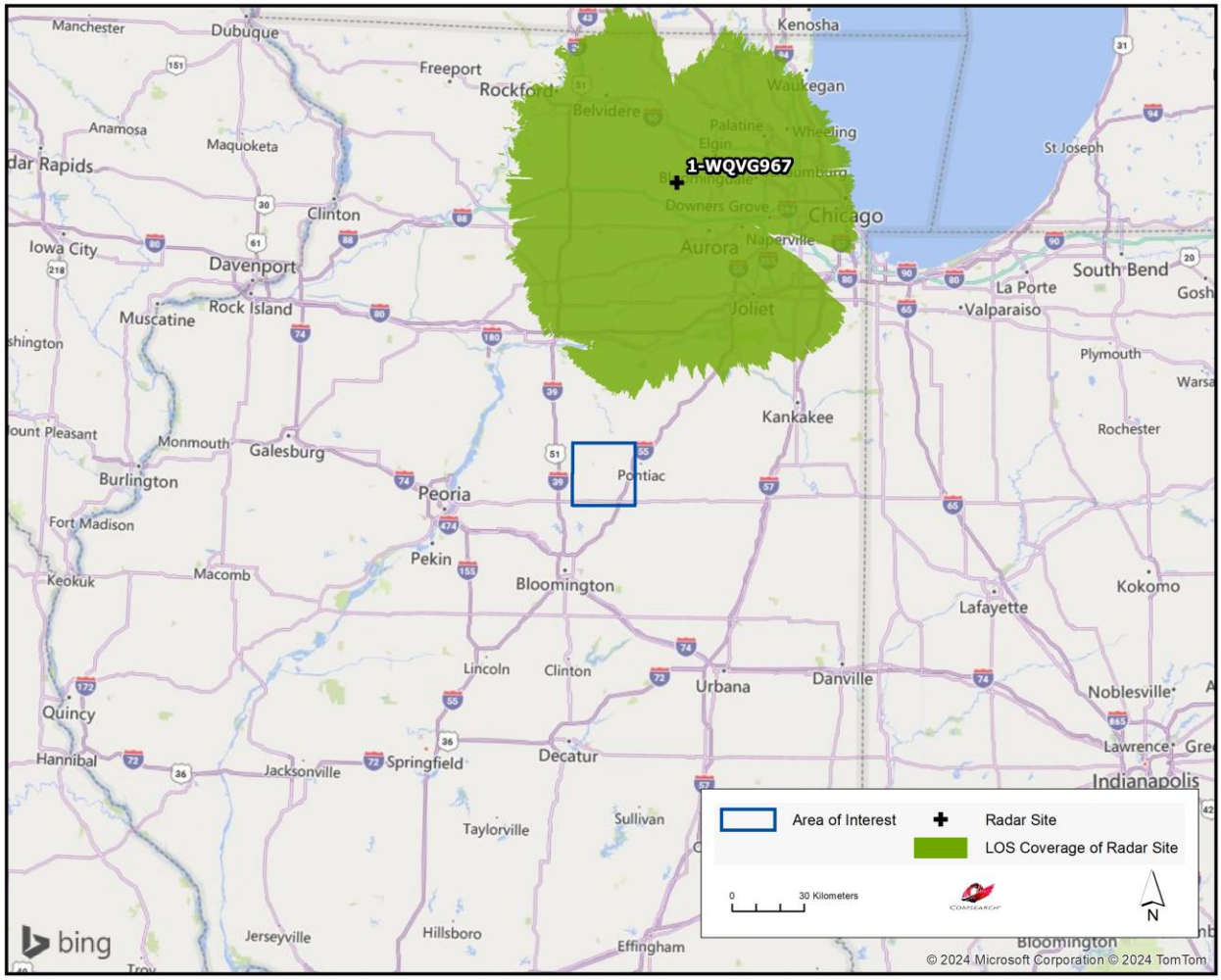

Figure A1-1: Line-of-Sight Coverage of WQVG967 with Respect to Panther Grove 2 Wind Project Area

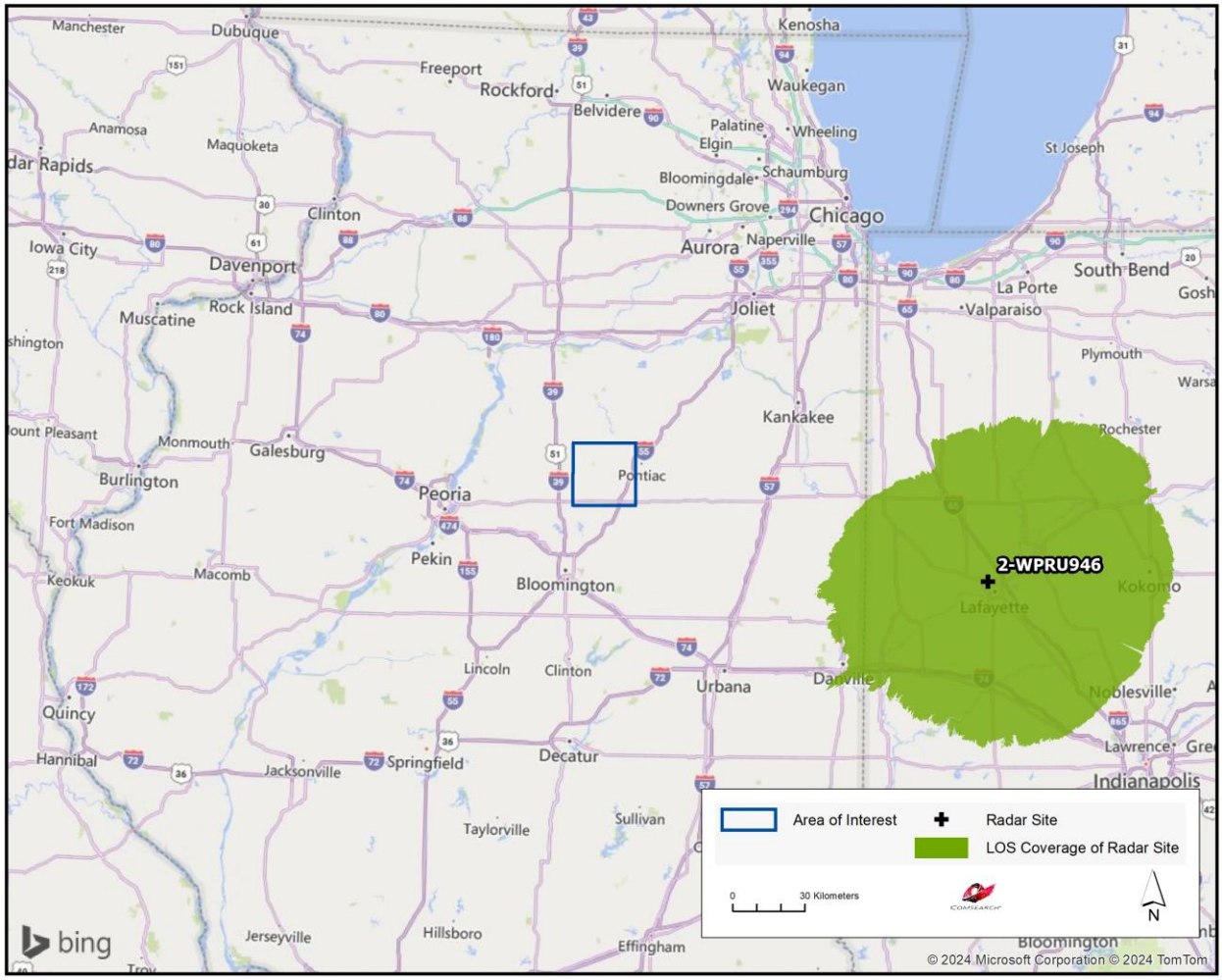

Figure A1-2: Line-of-Sight Coverage of WPRU946 with Respect to Panther Grove 2 Wind Project Area

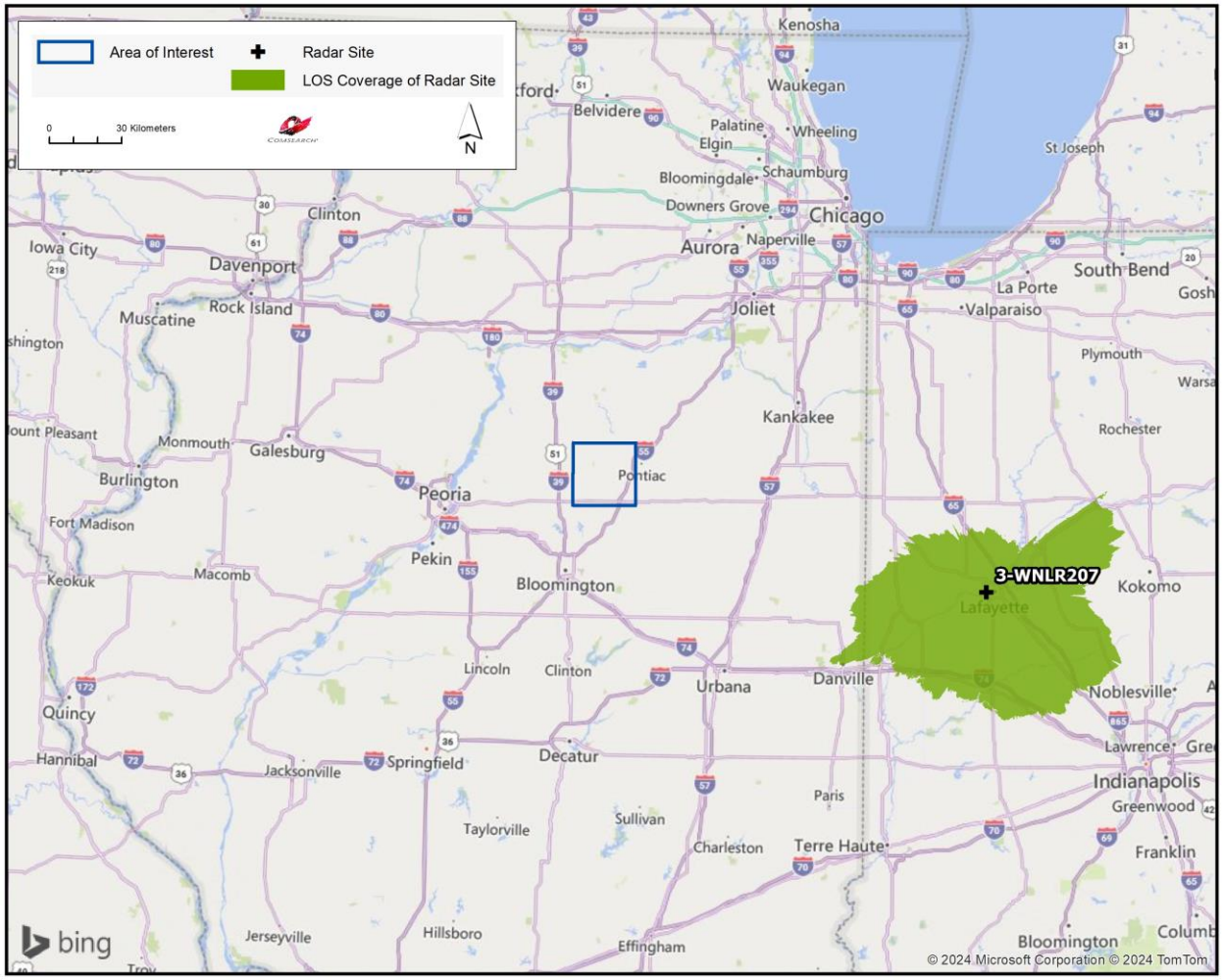

Figure A1-3: Line-of-Sight Coverage of WNLR207 with Respect to Panther Grove 2 Wind Project Area

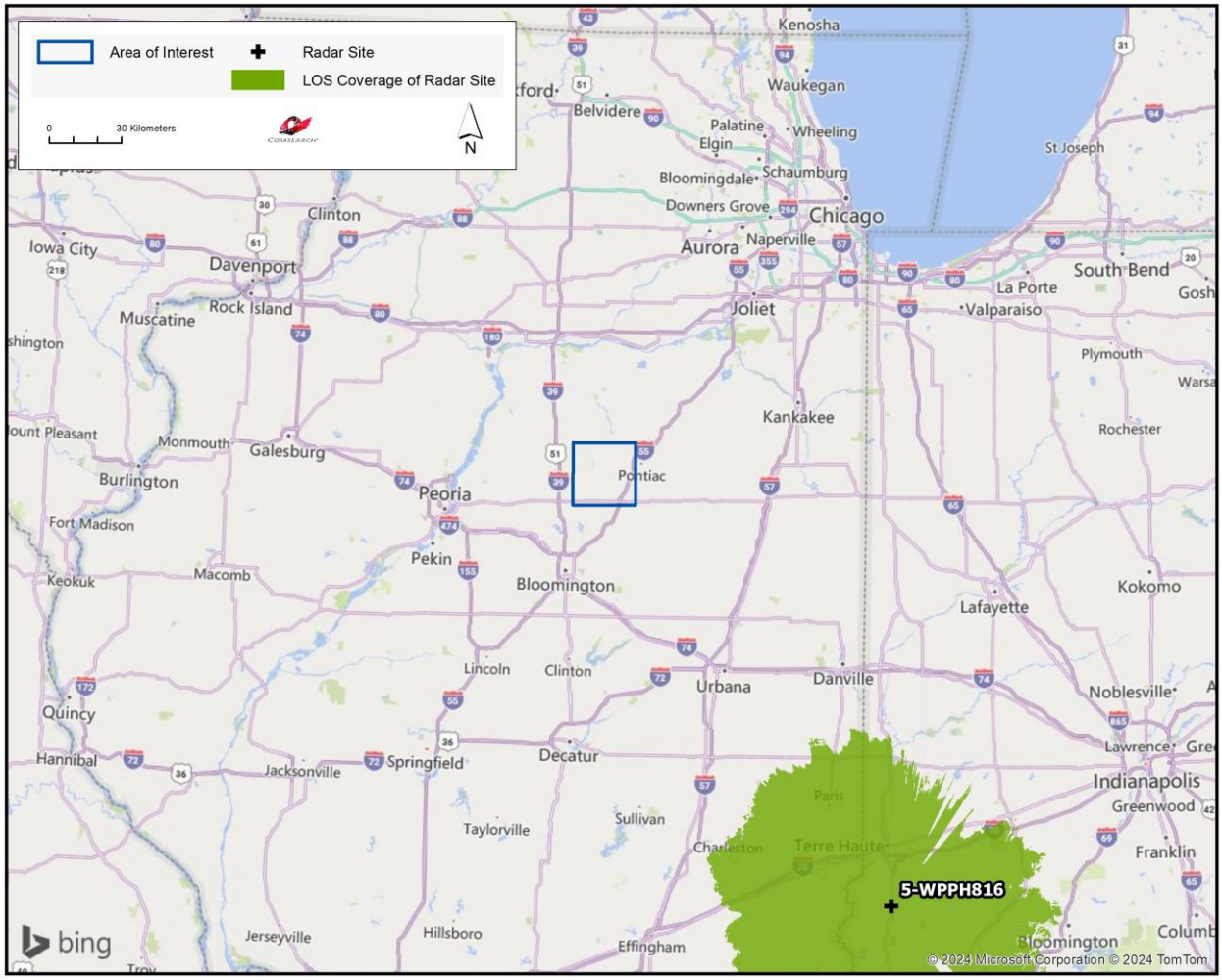

Figure A1-4: Line-of-Sight Coverage of WPPH816 with Respect to Panther Grove 2 Wind Project Area

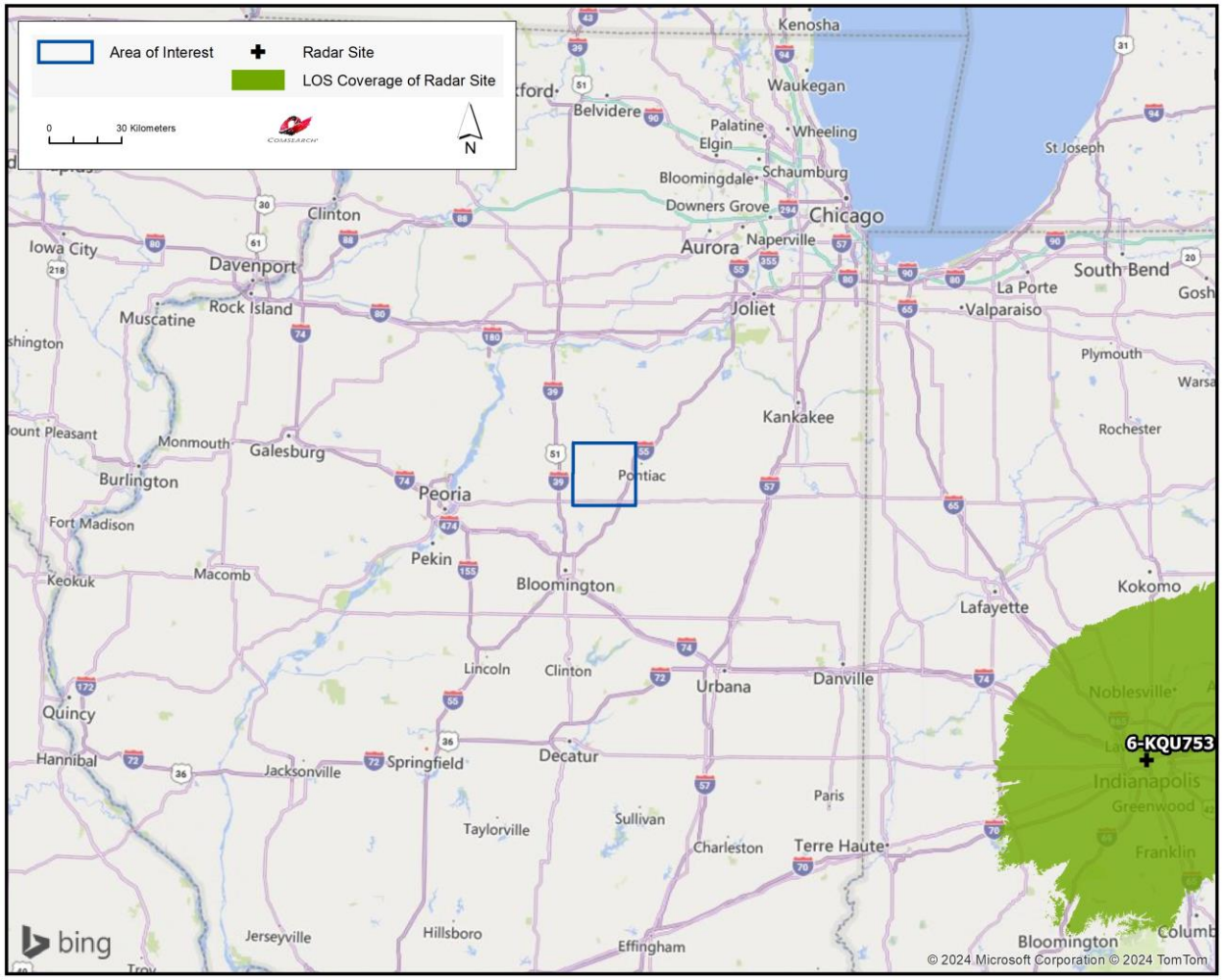

Figure A1-5: Line-of-Sight Coverage of KQU753 with Respect to Panther Grove 2 Wind Project Area

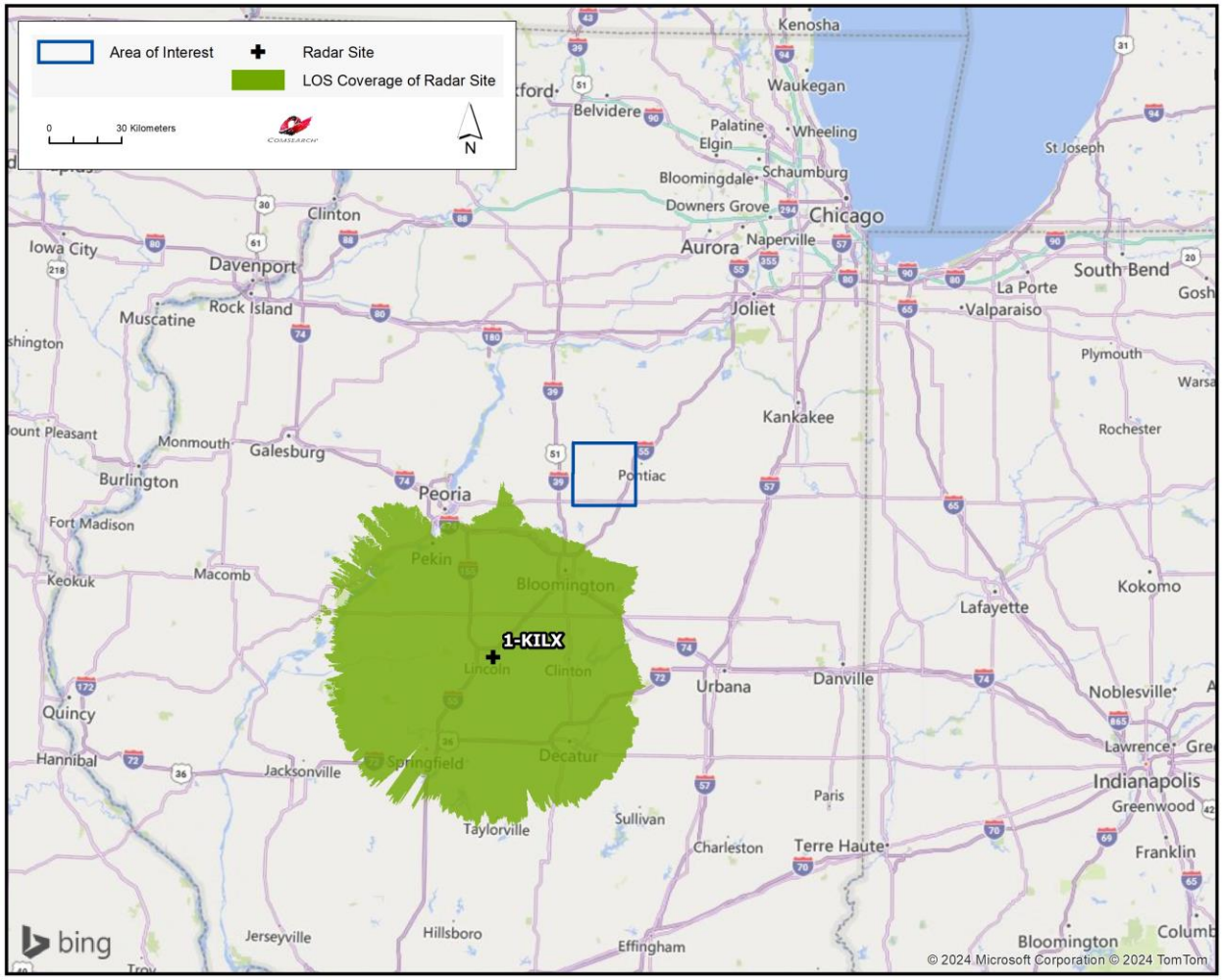

Figure A2-1: Line-of-Sight Coverage of KILX with Respect to Panther Grove 2 Wind Project Area

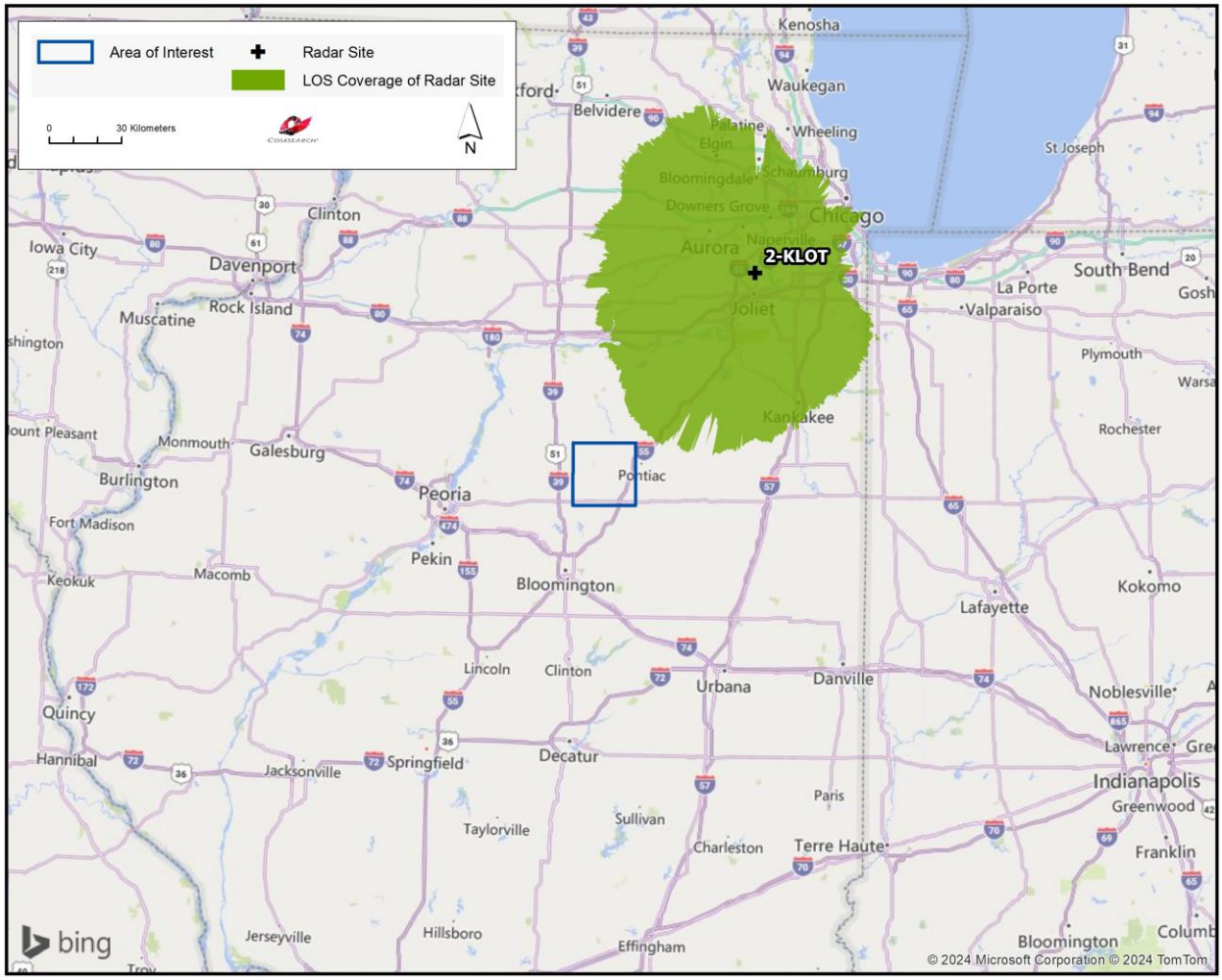

Figure A2-2: Line-of-Sight Coverage of KLOT with Respect to Panther Grove 2 Wind Project Area

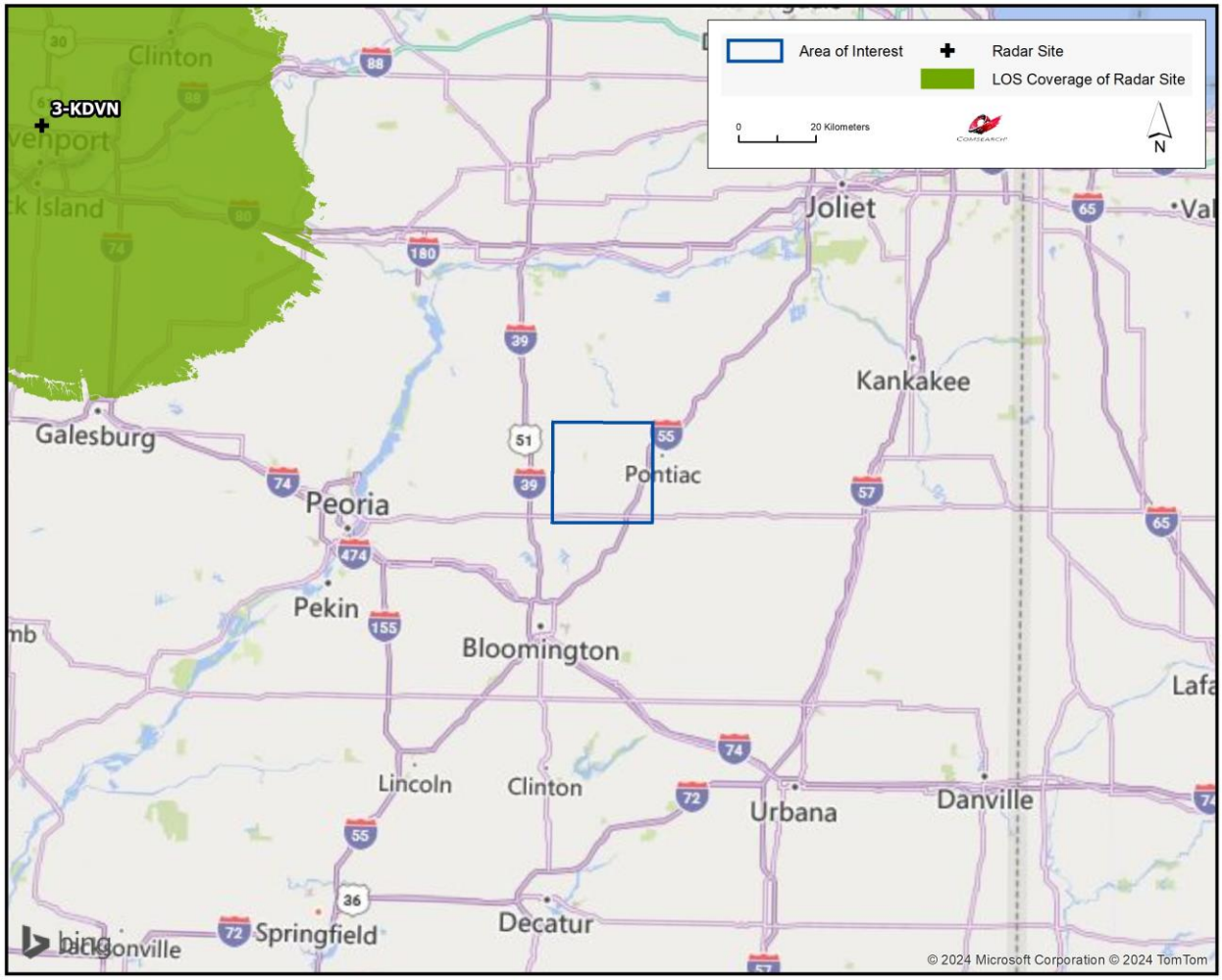

Figure A3-3: Line-of-Sight Coverage of KDVN with Respect to Panther Grove 2 Wind Project Area

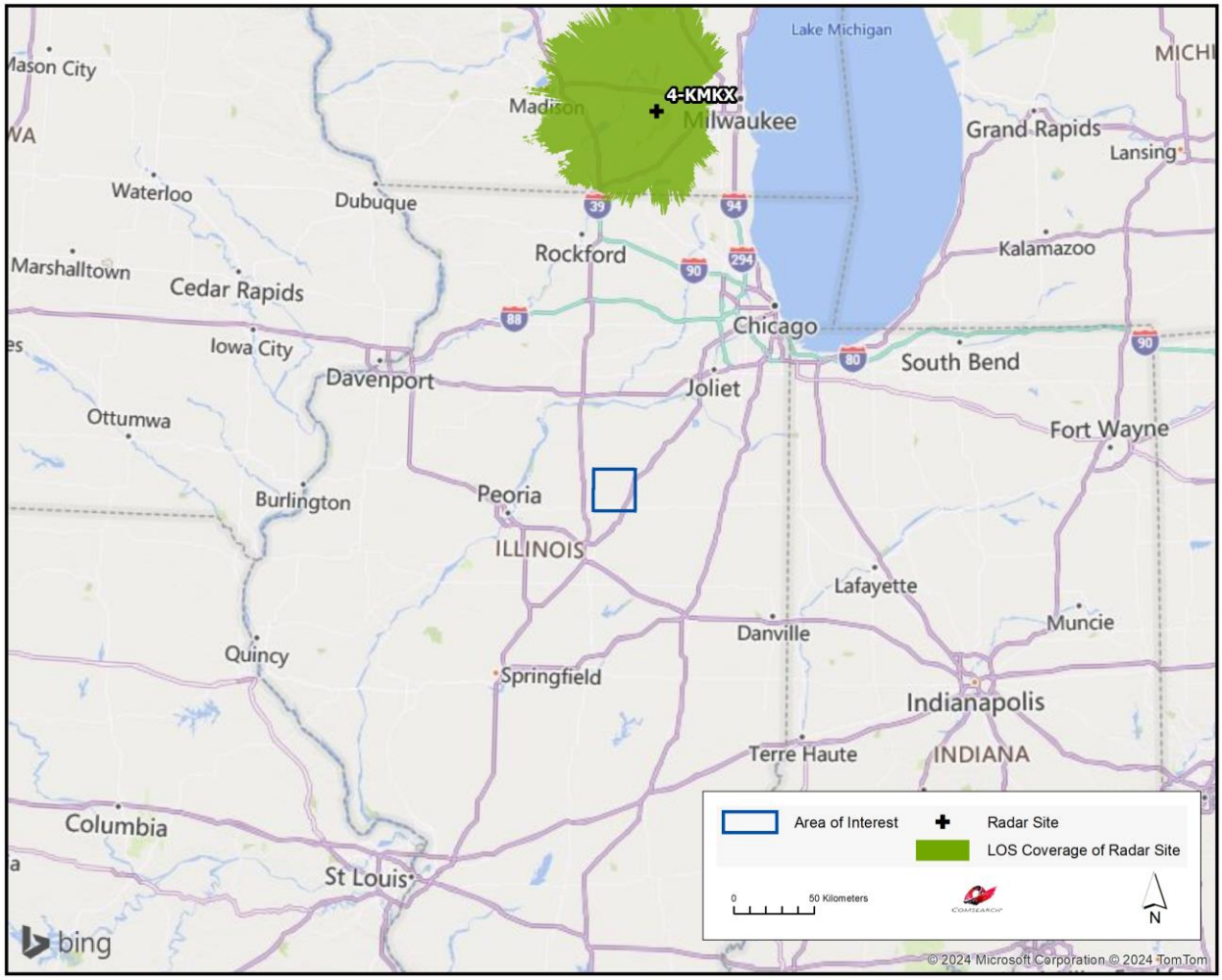

Figure A4-4: Line-of-Sight Coverage of KMKX with Respect to Panther Grove 2 Wind Project Area

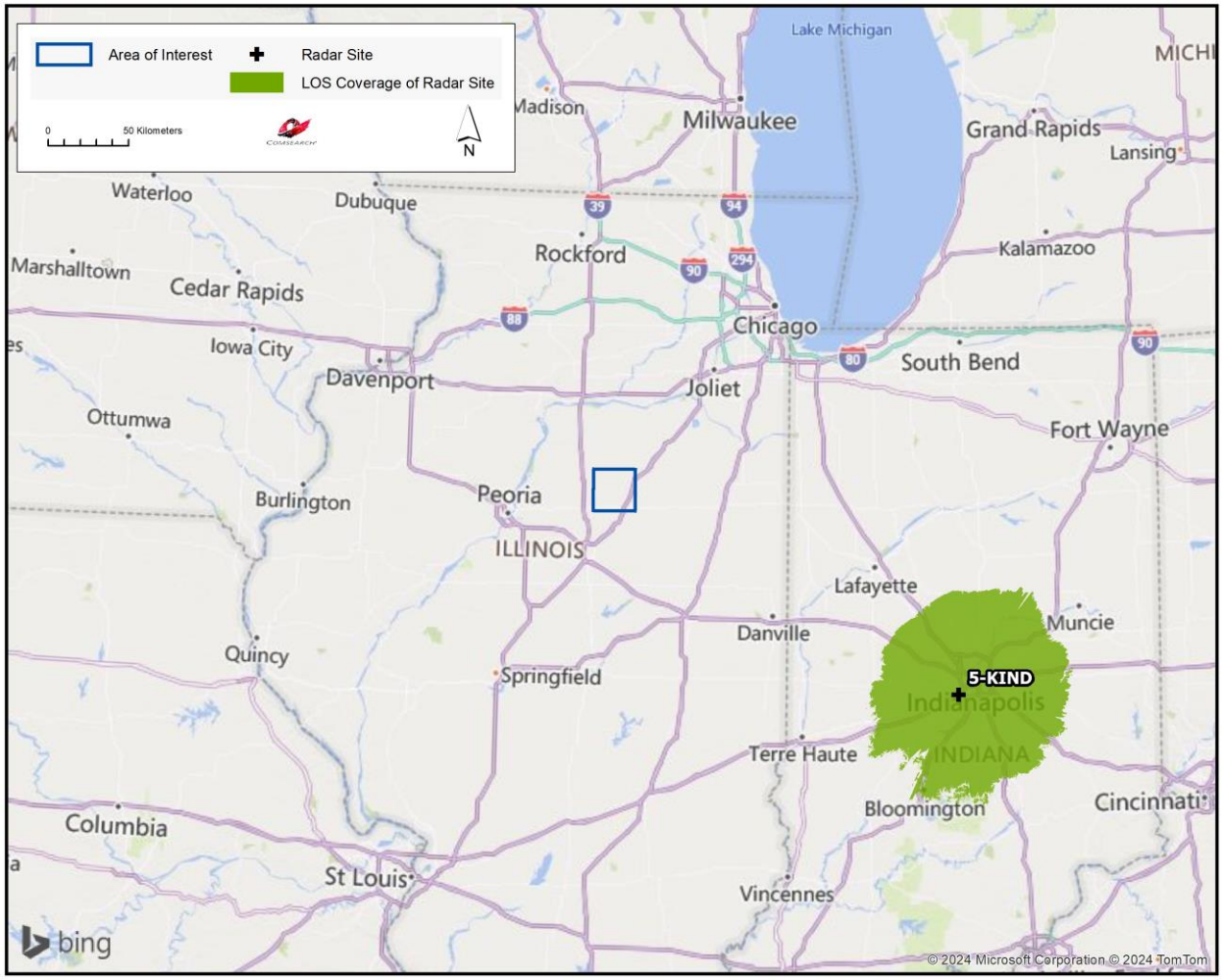

Figure A4-5: Line-of-Sight Coverage of KIND with Respect to Panther Grove 2 Wind Project Area

Wind Power GeoPlanner™

Microwave Study

Panther Grove 2

Prepared on Behalf of
Panther Grove 2 LLC

January 10, 2024

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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: Panther Grove 2

County: Livingston

State: Illinois

Number of Turbines: TBD

Turbine Tip Height: 213 meters

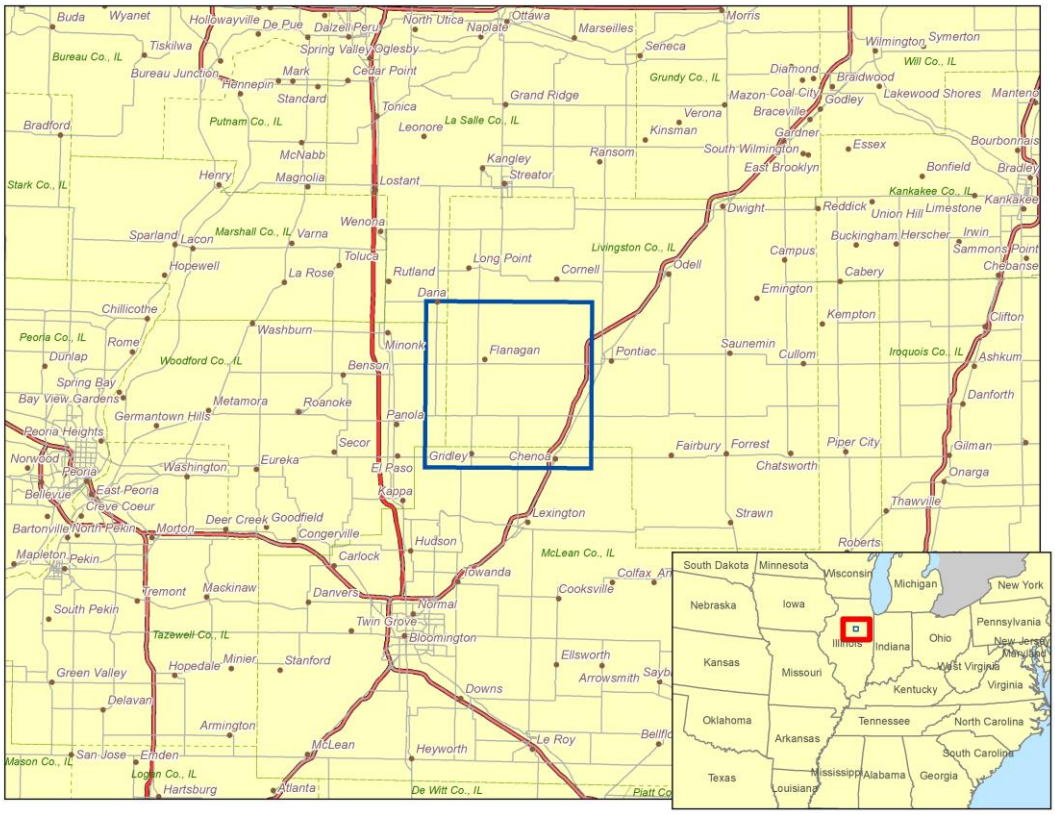


Figure 1: Area of Interest

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.

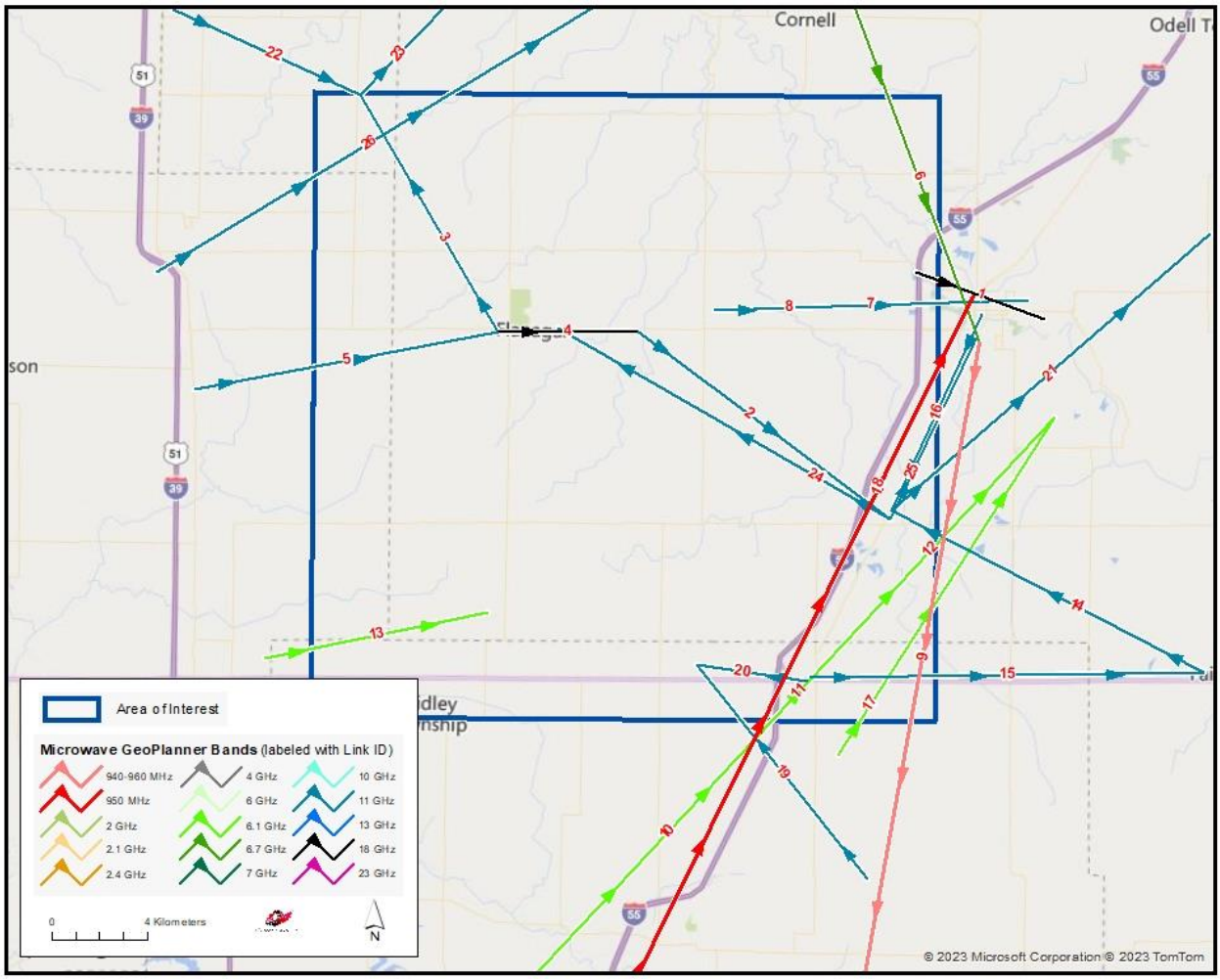


Figure 2: Microwave Paths that Intersect the Area of Interest

[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.

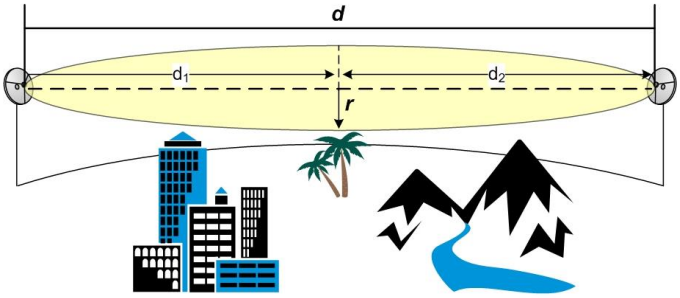
ID	Status	Callsign 1	Callsign 2	Band	Path Length (km)	Licensee
1	Applied	CH89103A	CH89006B	18 GHz	5.69	T-Mobile License LLC
2	Applied	IL-FLANA	IL-CHENO	11 GHz	13.14	AMG Technology Investment Group LLC
3	Applied	IL-FLANA	WROX918	11 GHz	11.42	AMG Technology Investment Group LLC
4	Applied	IL-FLANA	IL-FLANA	18 GHz	5.74	AMG Technology Investment Group LLC
5	Applied	IL-MINON	IL-FLANA	11 GHz	12.84	AMG Technology Investment Group LLC
6	Licensed	KJV88	KJV89	6.7 GHz	30.17	Illinois, State of DOT
7	Proposed	ROOKS CR	PONTIAC	11 GHz	13.07	Pontiac Township High School
8	Proposed	ROOKS CR	PONTIAC	11 GHz	13.07	Pontiac Township High School
9	Licensed	WAV645	WAV646	940-960 MHz	50.11	Illinois, State of DOT
10	Licensed	WPNC426	WSI45	6.1 GHz	39.67	ComEd a.k.a. Commonwealth Edison
11	Licensed	WPNC426	WSI45	6.1 GHz	39.67	ComEd a.k.a. Commonwealth Edison
12	Licensed	WPNC426	WSI45	6.1 GHz	39.67	ComEd a.k.a. Commonwealth Edison
13	Licensed	WQQZ402	WQQZ401	6.1 GHz	9.49	Cellco Partnership -IA/IL/IN/WI
14	Licensed	WQWK830	WRJT453	11 GHz	14.62	Maxwire Inc.
15	Licensed	WRBK835	WQWK830	11 GHz	16.42	Maxwire Inc.
16	Applied	WRCR412	WRJT453	11 GHz	8.97	Maxwire Inc.
17	Licensed	WREW294	WSI45	6.1 GHz	16.66	ComEd a.k.a. Commonwealth Edison
18	Licensed	WRHT554	RXONLY	950 MHz	38.22	2820 Communications Inc
19	Licensed	WRJE387	WRJP295	11 GHz	11.41	Maxwire Inc.
20	Licensed	WRJP294	WRJP295	11 GHz	4.66	Maxwire Inc.
21	Licensed	WRJT453	WRCR409	11 GHz	17.52	Maxwire Inc.
22	Licensed	WRMJ648	WROX918	11 GHz	8.57	AMG Technology Investment Group LLC
23	Licensed	WROX918	WRUI677	11 GHz	7.04	AMG Technology Investment Group LLC
24	Licensed	WRUI568	WRUI564	11 GHz	15.91	T-Mobile License LLC
25	Licensed	WRUI568	WRVH590	11 GHz	8.15	T-Mobile License LLC
26	Licensed	WRXG574	WRXG579	11 GHz	21.38	T-Mobile License LLC

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. Likewise, Comsearch recommends that an area directly in front of each microwave antenna should be avoided. This corresponds to the Consultation Zone which measures 1 kilometer along the main beam of the antenna and 24 ft (7.3 meters) wide. A depiction of the individual Fresnel and Consultation Zones is shown in Figure 3, and is also included in the shapefiles[3,4].

[3] The ESRI® shapefiles enclosed are in NAD 83 UTM Zone 16 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.

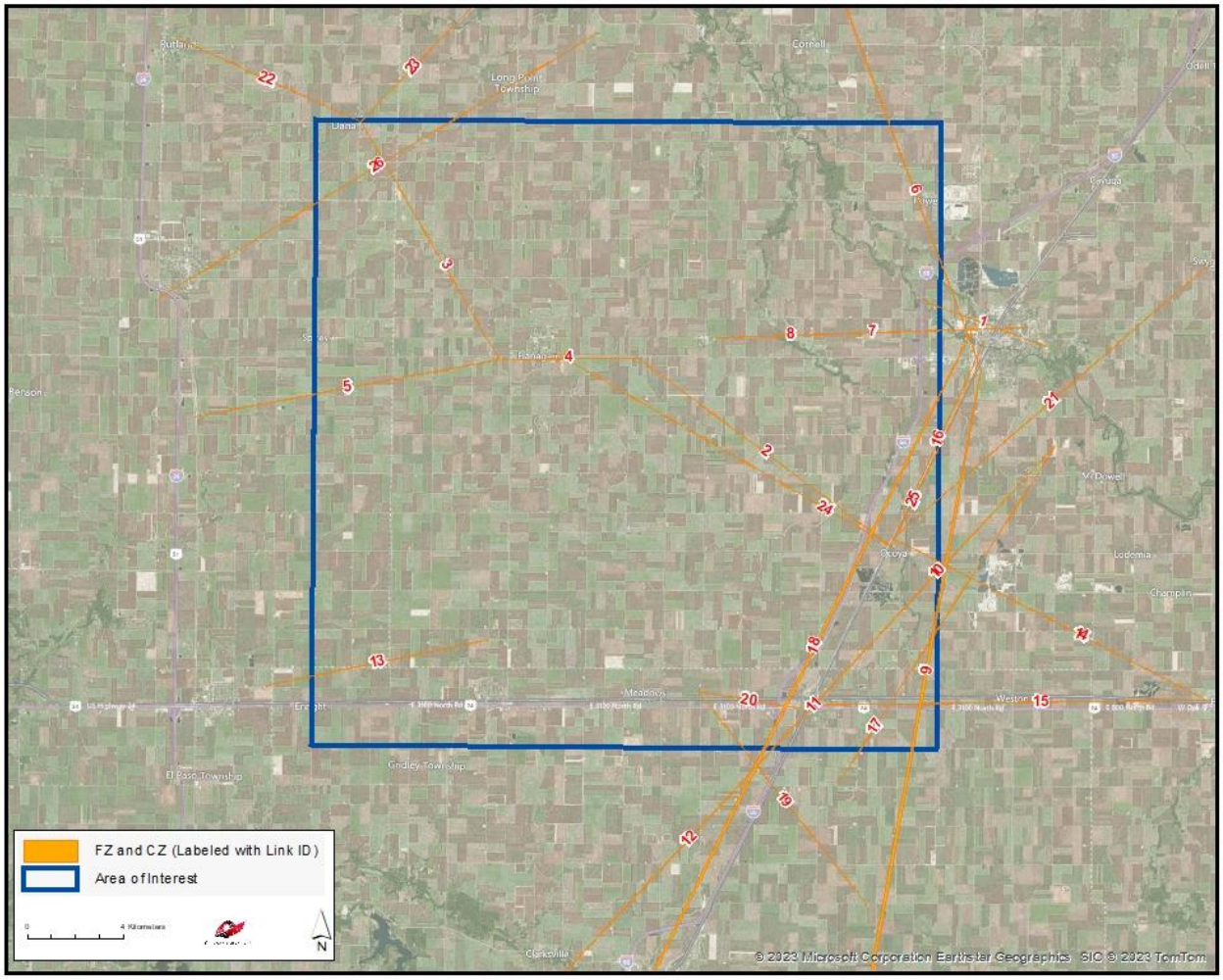


Figure 3: Fresnel and Consultation Zones in the Area of Interest

Discussion of Potential Obstructions

Total Microwave Paths	Paths with Affected Fresnel Zones	Total Turbines	Turbines intersecting Fresnel Zones
26	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 twenty-six microwave paths intersecting the Panther Grove 2 project area. The Fresnel and Consultation Zones for these microwave paths were calculated and mapped. We recommend that all turbines be sited in locations that will not encroach on these exclusion zones.

5. Contact

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

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Web site:	www.comsearch.com

Wind Power GeoPlanner™

AM and FM Radio Report

Panther Grove 2

Prepared on Behalf of
Panther Grove 2 LLC

January 12, 2024

COMSEARCH®
A CommScope Company

Table of Contents

1. Introduction

Comsearch analyzed AM and FM radio broadcast stations whose service could potentially be affected by the proposed Panther Grove 2 Project in Livingston County, Illinois.

2. Summary of Results

AM Radio Analysis
Comsearch found two database records[1] for AM stations within approximately 30 kilometers of the project, as shown in Table 1 and Figure 1. Both records are for station WSPL, which broadcasts out of Streator, Illinois, located 22.12 km to the north of the project area of interest (AOI). WSPL is licensed separately for daytime and nighttime operations with a lower power at night.

ID	Call Sign	Status[2]	Frequency (kHz)	Transmit ERP[3] (kW)	Operation Time	Latitude (NAD 83)	Longitude (NAD 83)	Minimum Separation Distance (km)	Distance to the AOI (km)
1	WSPL	LIC	1250	0.5	Daytime	41.158367	-88.837019	2.40	22.12
2	WSPL	LIC	1250	0.064	Nighttime	41.158367	-88.837019	2.40	22.12

Table 1: AM Radio Stations within 30 Kilometers of Project Area

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

[2] LIC = Licensed and operational station; APP = Application for construction permit; CP=Construction permit granted; CP MOD = Modification of construction permit.

[3] ERP = Transmit Effective Radiated Power.

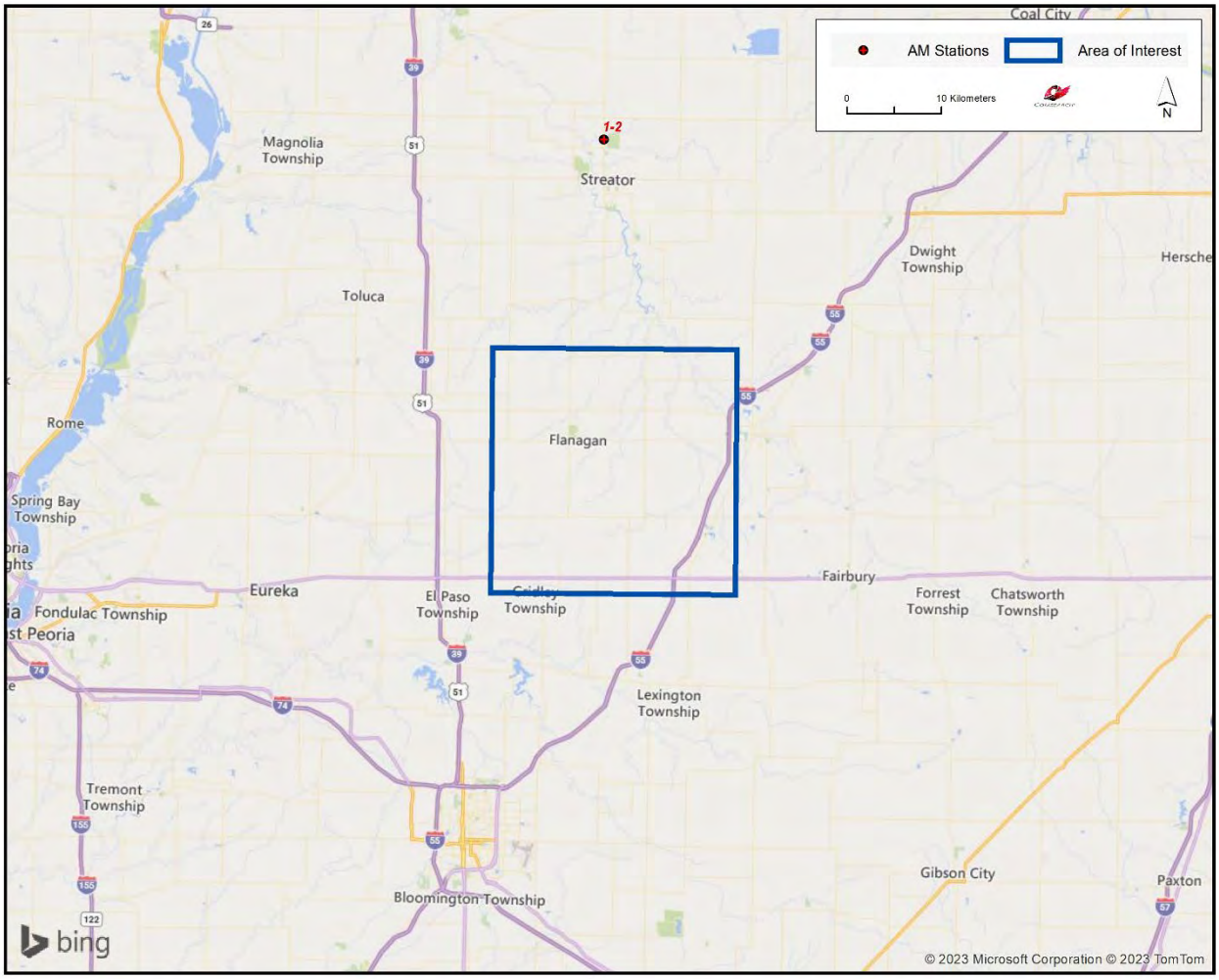

Figure 1: AM Radio Stations within 30 Kilometers of Project Area

FM Radio Analysis

Comsearch determined that there were twenty-nine database records for FM stations within a 30-kilometer radius of the Panther Grove 2 Project, as shown in Table 2 and Figure 2. All of the stations are currently licensed and operating, eight of which are translator stations, four are low power stations, and two are auxiliary (backup) stations that operate with limited range. The closest stations are W208AW and WPJC, both are currently licensed in Pontiac, Illinois, and are located 1.47 and 1.48 km respectively from the eastern edge of the project AOI.

ID	Call Sign	Status[4]	Service[5]	Frequency (MHz)	Transmit ERP[6] (kW)	Latitude (NAD 83)	Longitude (NAD 83)	Distance to the AOI (km)
1	W208AW	LIC	FX	89.5	0.08	40.886417	-88.644778	1.47
2	WPJC	LIC	FM	88.3	20.0	40.886389	-88.644722	1.48
3	WJBC-FM	LIC	FM	93.7	12.0	40.757528	-88.627833	2.74
4	WJWR	LIC	FM	90.3	18.0	40.683167	-88.762000	4.76
5	W234AO	LIC	FX	94.7	0.25	40.741972	-89.031167	5.40
6	WIBL	LIC	FM	107.7	14.0	40.630028	-88.781167	10.64
7	WIBL	LIC	FS	107.7	5.8	40.630028	-88.781167	10.64
8	WJHV-LP	LIC	FL	95.1	0.047	40.747250	-88.515611	12.20
9	WZIM	LIC	FM	99.5	6.0	40.575028	-88.837556	16.69
10	WJEZ	LIC	FM	98.9	1.3	41.035028	-88.436167	20.81
11	W221CY	LIC	FX	92.1	0.25	40.511194	-88.954194	23.63
12	WGLT	LIC	FS	89.1	2.2	40.511694	-89.000139	23.73
13	WZND-LP	LIC	FL	103.3	0.011	40.508361	-88.988667	24.01
14	WGVD-LP	LIC	FL	97.3	0.1	41.097444	-88.435778	24.42
15	WSTQ	LIC	FM	97.7	6.0	41.180306	-88.868417	24.59
16	W253BX	LIC	FX	98.5	0.25	41.180306	-88.868417	24.59
17	WXRJ-LP	LIC	FL	94.9	0.079	40.500583	-88.928694	24.84
18	W255AI	LIC	FX	98.9	0.055	40.500583	-88.928667	24.84
19	WESN	LIC	FM	88.1	0.12	40.491139	-88.993667	25.95
20	WRPW	LIC	FM	92.9	6.0	40.491139	-88.720611	26.13
21	W284BT	LIC	FX	104.7	0.038	40.489194	-89.006472	26.28
22	W261BK	LIC	FX	100.1	0.019	40.483083	-88.995361	26.85
23	WIHN	LIC	FM	96.7	3.9	40.476139	-89.033944	28.09
24	WGLT	LIC	FM	89.1	25.0	40.479472	-89.053389	28.11
25	W293DJ	LIC	FX	106.5	0.25	40.475528	-89.034111	28.16
26	WSPI	LIC	FM	89.5	7.0	40.477250	-88.553944	29.14

[4] LIC = Licensed and operational station; APP = Application for construction permit; CP=Construction permit granted; CP MOD = Modification of construction permit.

[5] FM = FM broadcast station; FX = FM translator station; FS = FM auxiliary (backup) station; FL = FM low power station.

[6] ERP = Transmit Effective Radiated Power.

ID	Call Sign	Status[4]	Service[5]	Frequency (MHz)	Transmit ERP[6] (kW)	Latitude (NAD 83)	Longitude (NAD 83)	Distance to the AOI (km)
27	WCSW	LIC	FM	88.1	0.1	40.477222	-88.553889	29.15
28	WBBE	LIC	FM	97.9	5.4	40.452250	-88.963417	30.17
29	WWHX	LIC	FM	100.7	4.2	40.452250	-88.963417	30.17

Table 2: FM Radio Stations within 30 km

ID	Call Sign	Status[7]	Frequency (MHz)	Antenna Make	Antenna Model	Antenna Size (m)	Recommended Minimum Separation Distance[8] (km)
1	W208AW	LIC	89.5	Unknown	Unknown	13.2 [9]	0.104
2	WPJC	LIC	88.3	PSI	FMR-4C-DA	13.6	0.109

Table 3: FM Radio Stations within 2 km of the Project Area with Calculated Separation Distances

[7] LIC = Licensed and operational station; APP = Application for construction permit; CP=Construction permit granted; CP MOD = Modification of construction permit.

[8] Recommended minimum separation distance is based on the far field distance of the antenna or 1.5 km if no antenna information is available and includes separation from both the turbine towers and blades.

[9] Maximum possible antenna size based on licensed station information. Antenna centerline = 54 meters, Overall tower height = 60.6 meters. Maximum antenna size = 2 x (60.6 m – 54 m) = 13.2 meters.

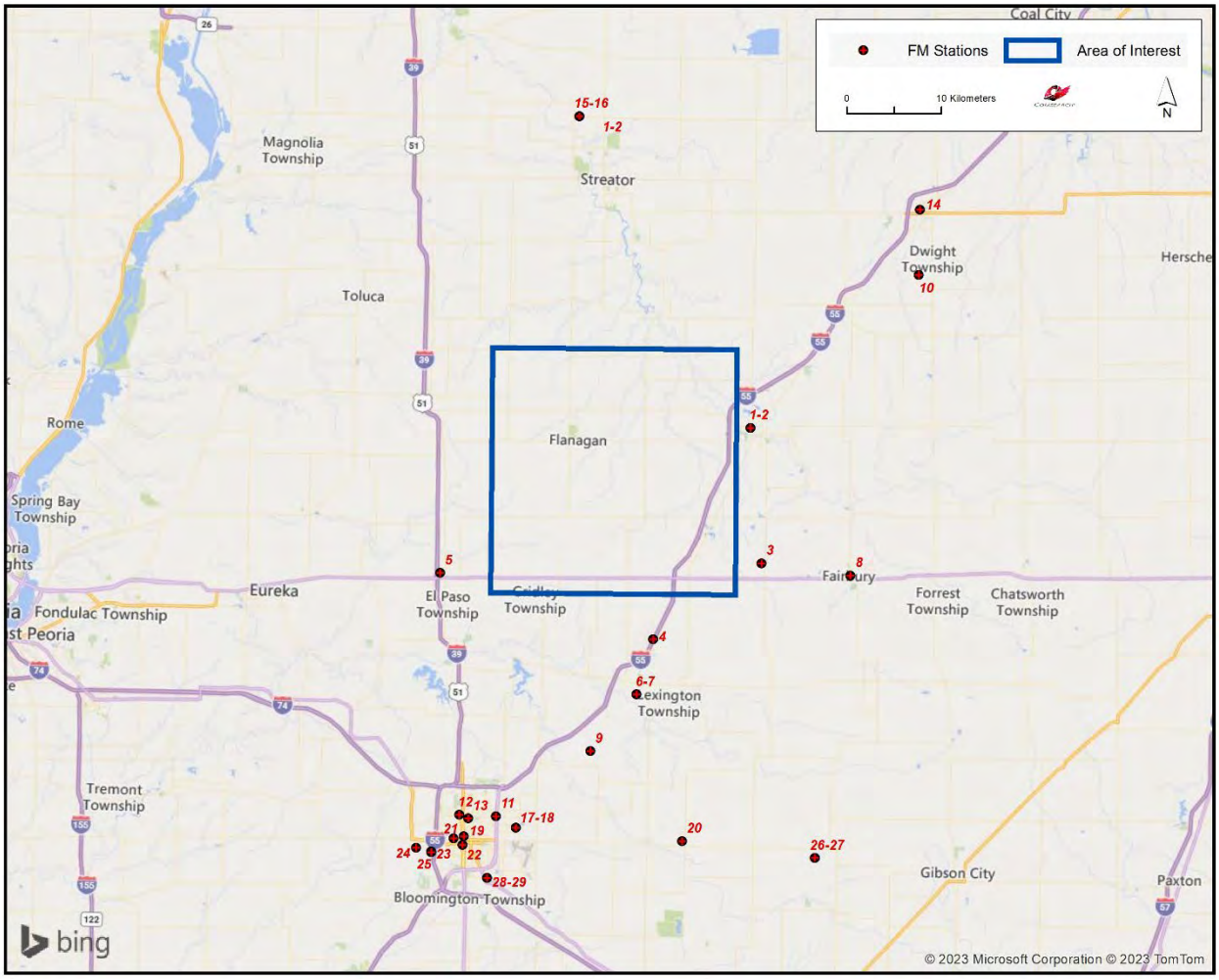

Figure 2: FM Radio Stations within 30 km

3. Impact Assessment

The exclusion distance for AM broadcast stations varies as a function of the antenna type and broadcast frequency. For directional antennas, the exclusion distance is calculated by taking the lesser of 10 wavelengths or 3 kilometers. For non-directional antennas, the exclusion distance is simply equal to 1 wavelength. Potential problems with AM broadcast coverage are only anticipated when AM broadcast stations are located within their respective exclusion distance limit from wind turbine towers. The closest AM station (WSPL) is located 22.12 km from the project. As there were no stations found within 3 kilometers of the project, which is the maximum possible exclusion distance based on a directional AM antenna broadcasting at 1000 KHz or less, the project should not impact the coverage of local AM stations.

The coverage of FM stations is generally not sensitive to interference due to wind turbines, especially when large objects (e.g., wind turbines) are located in the far field region of the radiating antenna to avoid the risk of distorting its radiation pattern. Stations W208AW and WPJC are the nearest FM stations to the AOI at 1.47 km and 1.48 km away respectively. Based on the licensed antenna information, W208AW requires a minimum separation distance of 0.104 km and WPJC requires a minimum separation distance of 0.109 km from the stations and any turbine tower and blade. Based on the separation distances from the AOI, the minimum separation distances are met and there should be adequate separation to avoid radiation pattern distortion. All other FM stations are located 2.74 km or further from the AOI and would not be impacted by the wind project.

4. Recommendations

Since no impact on the licensed and operational AM and FM broadcast stations was identified in our analysis, no recommendations or mitigation techniques are required for the AM and FM stations for this project.

5. Contact

For questions or information regarding the AM and FM Radio Report, please contact:

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Wind Power GeoPlanner™

Off-Air TV Analysis

Panther Grove 2

Prepared on Behalf of
Panther Grove 2 LLC

January 12, 2024

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Panther Grove 2 LLC
Wind Power GeoPlanner™
Off-Air Television Report
Panther Grove 2

1. Introduction

Off-air television stations broadcast signals from terrestrially-based facilities directly to television receivers. Comsearch identified those off-air stations whose service could potentially be affected by the proposed Panther Grove 2 wind project in Livingston County, Illinois. Comsearch then examined the coverage of the stations and the communities in the area that could potentially have degraded television reception due to the location of the proposed wind turbines.

2. Summary of Results

The proposed wind energy project area and local communities are depicted in Figure 1, below.

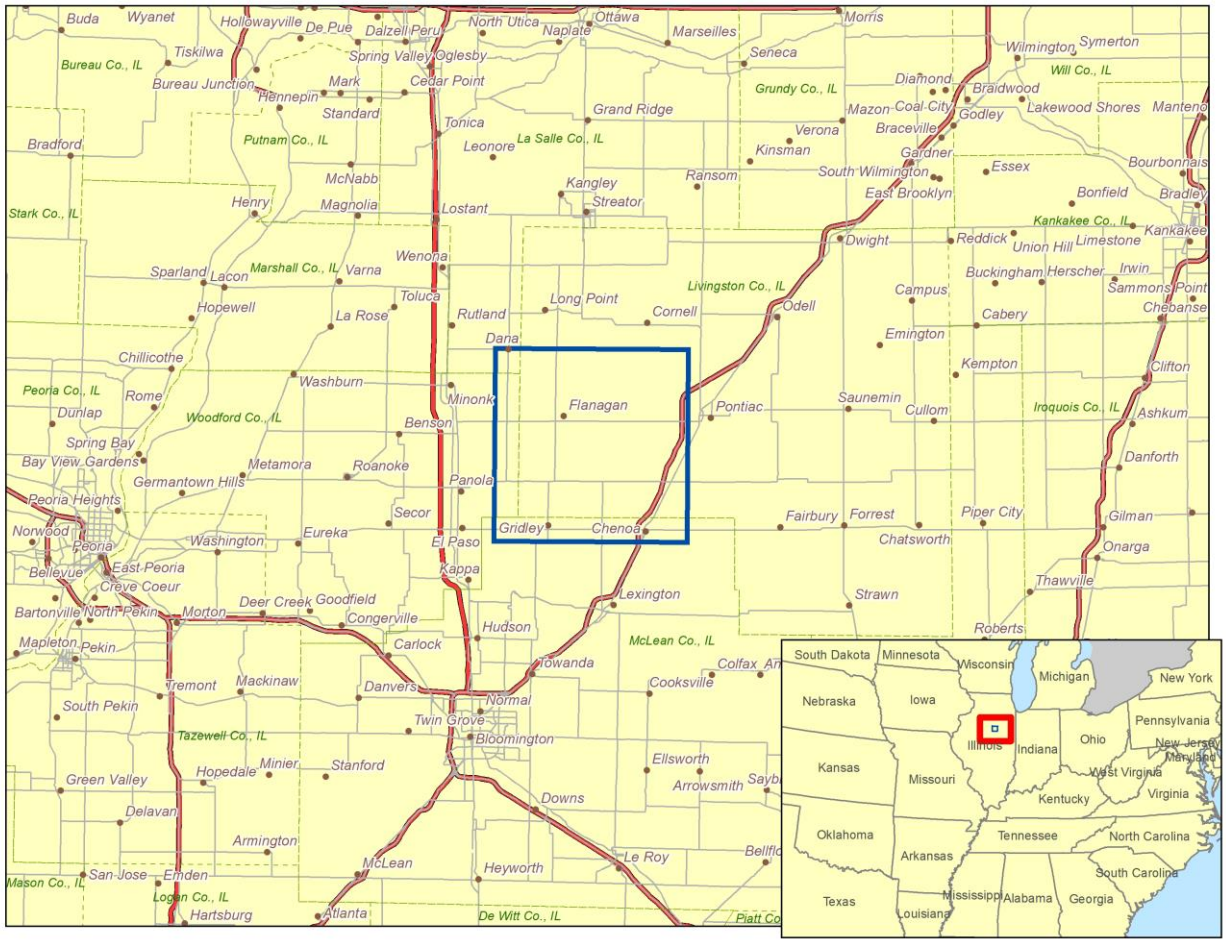

Figure 1: Wind Farm Project Area and Local Communities

To begin the analysis, Comsearch compiled all off-air television stations[1] within 150 kilometers of the proposed turbines. TV stations at a distance of 150 kilometers or less are the most likely to provide off-air coverage to the project area and neighboring communities. These stations are listed in Table 1, on the next page, and a plot depicting their locations is provided in Figure 2. There are a total of 103 database records for stations within approximately 150 kilometers of the project area of interest. Of these stations, only 80 stations are currently licensed and operating, 27 of which are low-power stations or translators. Translator stations are low-power stations that receive signals from distant broadcasters and retransmit the signal to a local audience. These stations serve local audiences and have limited range, which is a function of their transmit power and the height of their transmit antenna.

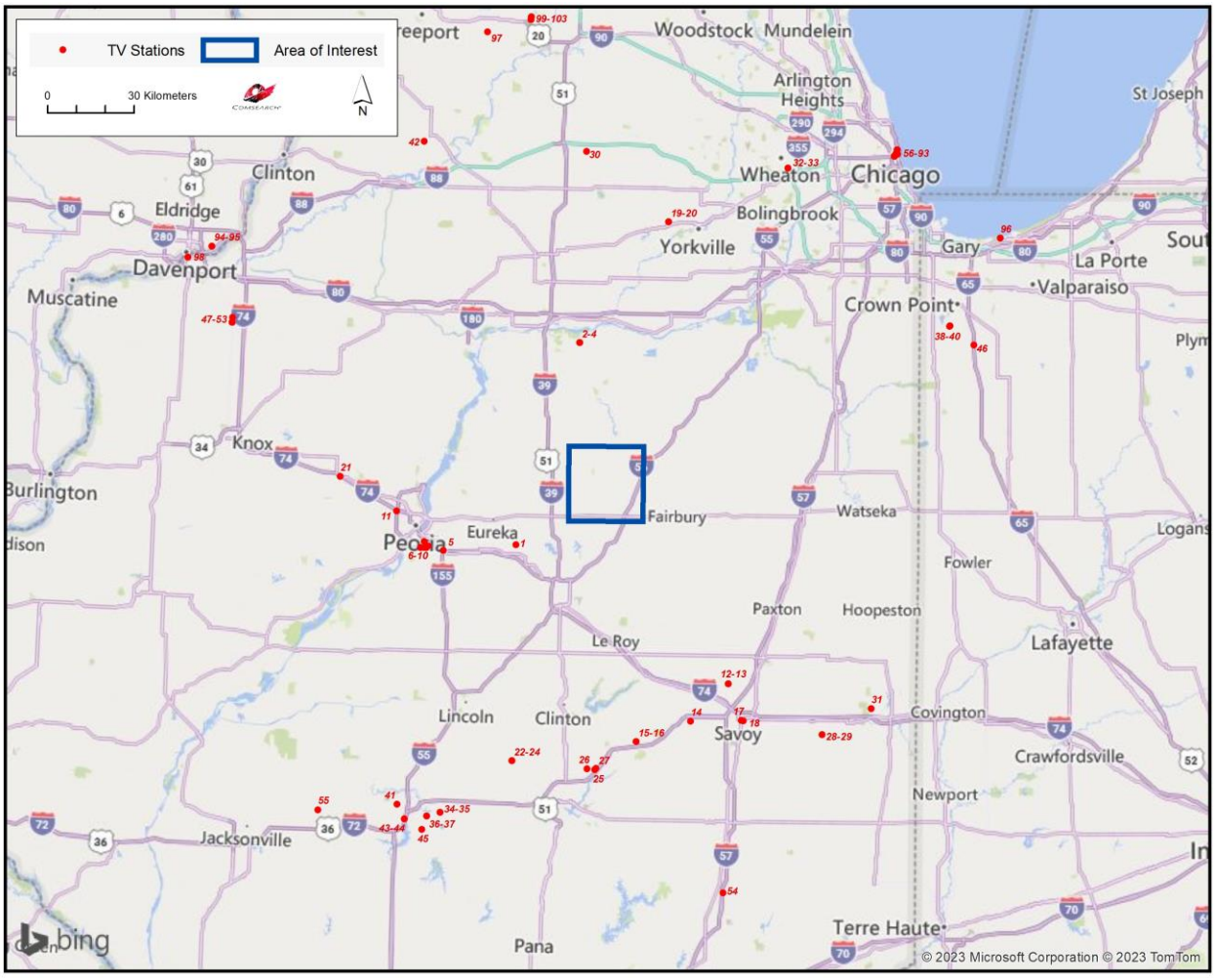

Figure 2: Plot of Off-Air TV Stations within 150 Kilometers of Area of Interest

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

ID	Call Sign	Status	Service[2]	Channel	Transmit ERP[3] (kW)	Latitude (NAD 83)	Longitude (NAD 83)	Distance to Area of Interest (km)
1	WYZZ-TV	LIC	DTV	28	1000.0	40.645833	-89.179167	19.93
2	WAOE	LIC	DTV	10	24.0	41.281833	-88.936417	35.94
3	WTVK	STA	DTV	10	30.0	41.281833	-88.936417	35.94
4	WTVK	LIC	DTS	10	30.0	41.281833	-88.936417	35.94
5	W27EQ-D	LIC	LPD	27	15.0	40.621944	-89.476667	44.57
6	WMBD-TV	LIC	DTV	26	822.0	40.635000	-89.538611	49.34
7	WHOI	LIC	DTV	24	402.0	40.629444	-89.548056	50.25
8	WEEK-TV	LIC	DTV	25	536.0	40.629444	-89.548056	50.25
9	WAOE	LIC	DRT	18	15.0	40.648056	-89.557222	50.61
10	WTVP	LIC	DTV	35	155.0	40.628889	-89.570000	52.07
11	WSIO-LD	CP	LPT	19	11.0	40.741153	-89.673717	59.67
12	W07DD-D	STA	LPD	7	0.1	40.224167	-88.298889	63.66
13	W07DD-D	LIC	LPD	7	0.28	40.224167	-88.298889	63.66
14	WCIA	LIC	DTV	34	681.0	40.105833	-88.450000	71.23
15	WILL-TV	APP	DTV	9	35.0	40.038889	-88.669444	76.39
16	WILL-TV	LIC	DTV	9	30.0	40.038889	-88.669444	76.39
17	WBXC-CD	LIC	DCA	18	15.0	40.111111	-88.243056	76.98
18	W27EL-D	LIC	LPD	27	15.0	40.109361	-88.234889	77.47
19	WAUR-LD	LIC	LPD	29	15.0	41.665278	-88.576111	78.56
20	WSPY-LD	LIC	LPD	30	10.8	41.665278	-88.576111	78.56
21	W19ES-D	LIC	LPT	19	1.62	40.843389	-89.911083	79.42
22	WCQA-LD	STA	LPD	12	1.5	39.971056	-89.174361	85.44
23	WCQA-LD	STA	LPD	12	1.5	39.971056	-89.174361	85.44

[2] Definitions of service and status codes:
ACA - Analog Class A
DCA - Digital Class A
DRT - Digital Replacement Translator
DT - ETL testing
DTS - Distributed Transmission System
DTV - Full Service Television
DTX - Digital TV Auxiliary
LPA - Low Power Analog TV
LPD - Low Power Digital TV
LPT - Digital TV Translator
LPX - Analog TV Translator
TS - Legacy Service for Analog TV Auxiliary
TV - Analog TV legacy

LIC – Licensed and operational station
CP – Construction permit granted
CP MOD – Modification of construction permit
APP – Application for construction permit, not yet operational
STA – Special transmit authorization, usually granted by FCC for temporary operation
AMD - Amendment

[3] ERP = Transmit Effective Radiated Power

ID	Call Sign	Status	Service[2]	Channel	Transmit ERP[3] (kW)	Latitude (NAD 83)	Longitude (NAD 83)	Distance to Area of Interest (km)
24	WCQA-LD	LIC	LPD	12	3.0	39.971056	-89.174361	85.44
25	WAND	LIC	DTV	20	1000.0	39.952389	-88.832389	85.82
26	WLCF-LD	LIC	LPD	17	15.0	39.950833	-88.868056	85.95
27	WBUI	LIC	DTV	22	325.0	39.948889	-88.836917	86.20
28	WICD	LIC	DTV	32	1000.0	40.069444	-87.912778	96.69
29	WCCU	LIC	DTV	36	125.0	40.069444	-87.912778	96.69
30	WYCH-LD	LIC	LPD	11	3.0	41.880028	-88.924889	102.36
31	W23EQ-D	LIC	LPT	23	12.1	40.151611	-87.713556	102.58
32	WAUR-LD	CP	LPD	29	12.3	41.838417	-88.080250	108.96
33	WWTO-TV	STA	DTV	35	15.0	41.838417	-88.080250	108.96
34	WICS	LIC	DTV	15	300.0	39.804167	-89.461111	110.45
35	WRSP-TV	LIC	DTV	16	310.0	39.804167	-89.461111	110.45
36	WCIX	CP	DTV	11	8.5	39.790944	-89.514722	113.60
37	WCIX	LIC	DTV	11	5.0	39.790944	-89.514722	113.60
38	WYIN	LIC	DTV	17	300.0	41.348889	-87.400556	114.39
39	WYIN	STA	DTV	17	300.0	41.349806	-87.399472	114.51
40	WYIN	CP	DTV	17	1000.0	41.349806	-87.399472	114.51
41	W27ES-D	LIC	LPD	27	5.6	39.825556	-89.636667	114.88
42	W27EJ-D	LIC	LPD	27	15.0	41.897861	-89.606056	117.12
43	WEAE-LD	LIC	LPD	21	15.0	39.780889	-89.605056	117.96
44	W31EH-D	LIC	LPD	31	0.1	39.780889	-89.605056	117.96
45	W23EW-D	LIC	LPD	23	15.0	39.748417	-89.532639	118.54
46	KPDS-LD	LIC	LPD	9	3.0	41.289917	-87.299917	120.15
47	WMWC-TV	LIC	DTV	8	23.0	41.312361	-90.379500	124.63
48	WMWC-TV	APP	DTV	8	39.0	41.312361	-90.379500	124.63
49	WQPT-TV	LIC	DTV	23	664.0	41.312361	-90.379500	124.63
50	KLJB	LIC	DTV	30	1000.0	41.312361	-90.379500	124.63
51	WQAD-TV	LIC	DTV	31	1000.0	41.312361	-90.379500	124.63
52	KQIN	LIC	DTV	34	199.5	41.312361	-90.379500	124.63
53	KGCW	LIC	DTV	21	1000.0	41.327500	-90.379444	125.16
54	WEIU-TV	LIC	DTV	30	174.0	39.570833	-88.307083	131.82
55	W19EE-D	LIC	LPD	19	0.2	39.800611	-89.955889	132.64
56	WMEU-CD	LIC	DCA	18	15.0	41.878917	-87.636167	133.27
57	WGN-TV	LIC	DTV	19	645.0	41.878917	-87.636167	133.27
58	WWME-CD	LIC	DCA	20	15.0	41.878917	-87.636167	133.27
59	WCIU-TV	LIC	DTV	23	1000.0	41.878917	-87.636167	133.27
60	WFLD	CP	DTV	24	1000.0	41.878917	-87.636167	133.27
61	WTTW	LIC	DTV	25	250.0	41.878917	-87.636167	133.27
62	WEDE-CD	LIC	DCA	28	2.84	41.878917	-87.636167	133.27
63	WMAQ-TV	LIC	DTV	29	350.0	41.878917	-87.636167	133.27
64	WSNS-TV	LIC	DTV	29	350.0	41.878917	-87.636167	133.27
65	WFLD	LIC	DTV	31	1000.0	41.878917	-87.636167	133.27

ID	Call Sign	Status	Service[2]	Channel	Transmit ERP[3] (kW)	Latitude (NAD 83)	Longitude (NAD 83)	Distance to Area of Interest (km)
66	WPWR-TV	LIC	DTV	31	1000.0	41.878917	-87.636167	133.27
67	WMAQ-TV	CP	DTV	33	398.0	41.878917	-87.636167	133.27
68	WRJK-LP	AMD	LPD	11	0.09	41.878889	-87.635556	133.30
69	WBBM-TV	CP	DTV	12	30.0	41.878889	-87.635556	133.30
70	WBBM-TV	LIC	DTV	12	10.9	41.878889	-87.635556	133.30
71	WJYS	LIC	DTV	21	140.0	41.878889	-87.635556	133.30
72	WXFT-DT	LIC	DTV	22	1000.0	41.878889	-87.635556	133.30
73	WLS-TV	LIC	DTV	22	1000.0	41.878889	-87.635556	133.30
74	WRJK-LP	CP	LPD	24	15.0	41.878889	-87.635556	133.30
75	WCPX-TV	LIC	DTV	34	400.0	41.878889	-87.635556	133.30
76	WDCI-LD	LIC	LPD	30	15.0	41.885028	-87.621583	134.57
77	WCHU-LD	LIC	LPD	7	3.0	41.889083	-87.626667	134.64
78	WOCK-CD	LIC	DCA	4	3.0	41.898917	-87.623111	135.66
79	WRME-LD	LIC	LPD	6	3.0	41.898917	-87.623111	135.66
80	WTVK	LIC	DTS	10	13.85	41.898917	-87.623111	135.66
81	WMEU-CD	CP	DCA	18	15.0	41.898917	-87.623111	135.66
82	WWME-CD	CP	DCA	20	15.0	41.898917	-87.623111	135.66
83	WCIU-TV	CP	DTV	23	1000.0	41.898917	-87.623111	135.66
84	WFLD	STA	DTV	24	1000.0	41.898917	-87.623111	135.66
85	WPVN-CD	LIC	DCA	26	15.0	41.898917	-87.623111	135.66
86	W27EB-D	LIC	DCA	27	15.0	41.898917	-87.623111	135.66
87	WDCI-LD	CP	LPD	30	0.85	41.898917	-87.623111	135.66
88	W31EZ-D	LIC	LPD	31	15.0	41.898917	-87.623111	135.66
89	WESV-LD	LIC	LPD	31	15.0	41.898917	-87.623111	135.66
90	WWTO-TV	LIC	DTV	32	15.0	41.898917	-87.623111	135.66
91	WLPD-CD	LIC	DCA	32	15.0	41.898917	-87.623111	135.66
92	WGBO-DT	LIC	DTV	35	635.0	41.898917	-87.623111	135.66
93	WRJK-LD	LIC	LPT	36	5.1	41.898917	-87.623111	135.66
94	WHBF-TV	LIC	DTV	4	33.7	41.546944	-90.476389	142.13
95	KWQC-TV	LIC	DTV	17	1000.0	41.546889	-90.477167	142.18
96	WODN-LD	LIC	LPD	13	3.0	41.624472	-87.191139	143.62
97	W35DY-D	LIC	LPT	35	3.44	42.245250	-89.353639	146.51
98	WHBF-TV	CP	DRT	19	0.25	41.510278	-90.574167	147.75
99	WTVO	LIC	DTV	16	196.0	42.287222	-89.170833	148.59
100	WQRF-TV	LIC	DTV	36	910.0	42.287222	-89.170833	148.59
101	WFBN-LD	LIC	LPD	23	15.0	42.296667	-89.170833	149.63
102	WSLN	LIC	DTV	9	30.0	42.296750	-89.170833	149.64
103	WIFR-LD	LIC	LPD	28	15.0	42.296750	-89.170833	149.64

Table 1: Off-Air TV Stations within 150 Kilometers of Area of Interest

3. Impact Assessment

Based on a contour analysis of the licensed stations within 150 kilometers of the Panther Grove 2, it was determined that 13 of the full-power digital stations, identified below in Table 2, along with low-power digital station W27EQ-D, may have their reception disrupted in and around the project. The areas primarily affected would include TV service locations within 10 kilometers of the turbines that have clear line-of-sight (LOS) to a proposed wind turbine but not to the respective station. After the wind turbines are installed, communities and homes in these locations may have degraded reception of these stations. This is due to multipath interference caused by signal scattering as TV signals are reflected by the rotating wind turbine blades and mast.

ID	Call Sign	Status	Service	Channel	Transmit ERP (kW)	Latitude (NAD 83)	Longitude (NAD 83)	Distance to Area of Interest (km)
1	WYZZ-TV	LIC	DTV	28	1000.0	40.645833	-89.179167	19.93
2	WAOE	LIC	DTV	10	24.0	41.281833	-88.936417	35.94
4	WTVK	LIC	DTS	10	30.0	41.281833	-88.936417	35.94
5	W27EQ-D	LIC	LPD	27	15.0	40.621944	-89.476667	44.57
6	WMBD-TV	LIC	DTV	26	822.0	40.635000	-89.538611	49.34
7	WHOI	LIC	DTV	24	402.0	40.629444	-89.548056	50.25
8	WEEK-TV	LIC	DTV	25	536.0	40.629444	-89.548056	50.25
10	WTVP	LIC	DTV	35	155.0	40.628889	-89.570000	52.07
14	WCIA	LIC	DTV	34	681.0	40.105833	-88.450000	71.23
16	WILL-TV	LIC	DTV	9	30.0	40.038889	-88.669444	76.39
25	WAND	LIC	DTV	20	1000.0	39.952389	-88.832389	85.82
27	WBUI	LIC	DTV	22	325.0	39.948889	-88.836917	86.20
28	WICD	LIC	DTV	32	1000.0	40.069444	-87.912778	96.69
29	WCCU	LIC	DTV	36	125.0	40.069444	-87.912778	96.69

Table 2: Licensed Off-Air TV Stations Subject to Degradation

4. Recommendations

While TV signals are reflected by wind turbines, which can cause multipath interference to the TV receiver, modern digital TV receivers have undergone significant improvements to mitigate the effects of signal scattering. When used in combination with a directional antenna, it becomes even less likely that signal scattering from wind farms will cause interference to digital TV reception.

Nevertheless, signal scattering could still impact certain areas currently served by the TV station mentioned above, especially those that would have line-of-sight to at least one wind turbine but not to the station antenna. In the unlikely event that interference is observed in any of the TV

service areas, it is recommended that a high-gain directional antenna be used, preferably outdoors, and oriented towards the signal origin in order to mitigate the interference.

Both cable service and direct broadcast satellite service will be unaffected by the presence of the wind turbine facility and may be offered to those residents who can show that their off-air TV reception has been disrupted by the presence of the wind turbines after they are installed.

5. Contact

For questions or information regarding the Off-Air TV Analysis, please contact:

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Company:	Comsearch
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Email:	David.Meyer@CommScope.com
Web site:	www.comsearch.com

Wind Power GeoPlanner™

Land Mobile & Emergency Services Report

Panther Grove 2

Prepared on Behalf of
Panther Grove 2, LLC

January 12, 2024

COMSEARCH®
A CommScope Company

Table of Contents

1. Introduction

An assessment of the emergency services in the Panther Grove 2 wind project area was performed by Comsearch to identify potential impact from the planned turbines. We evaluated the registered frequencies for the following types of first responder entities: police, fire, emergency medical services, emergency management, hospitals, public works, transportation and other state, county, and municipal agencies. We also identified all industrial and business land mobile radio (LMR) systems and commercial E911 operators within the proposed wind energy facility boundaries. This information is useful in the planning stages of the wind energy facility because the data can be used in support of facility communications needs and to evaluate any potential impact on the emergency services provided in that region. An overview of the project area, which is located in Livingston County, Illinois, appears below in Figure 1.

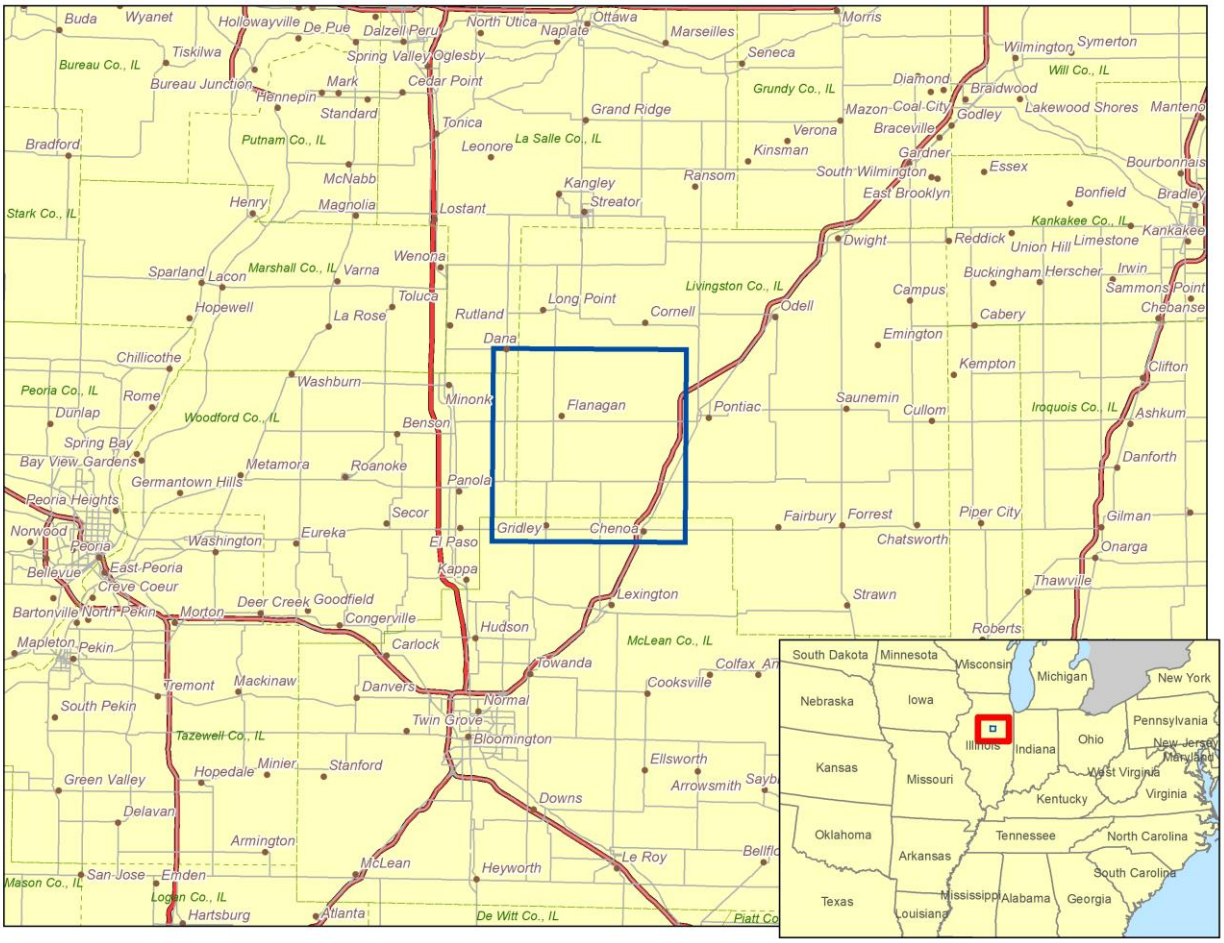

Figure 1: Area of Interest (AOI)

2. Summary of Results

Our land mobile and emergency services incumbent data[1] was derived from the FCC's Universal Licensing System (ULS) and the FCC's Public Safety & Homeland Security bureau. We identified both site-based licenses as well as regional area-wide licenses designated for public safety use.

Site-Based Licenses

The site-based licenses were imported into GIS software and geographically mapped relative to the wind energy project area of interest as defined by the customer. Each site on the map was given an ID number and associated with site information in a data table. A depiction of the fixed-site licenses in the project area appears in Figure 2.

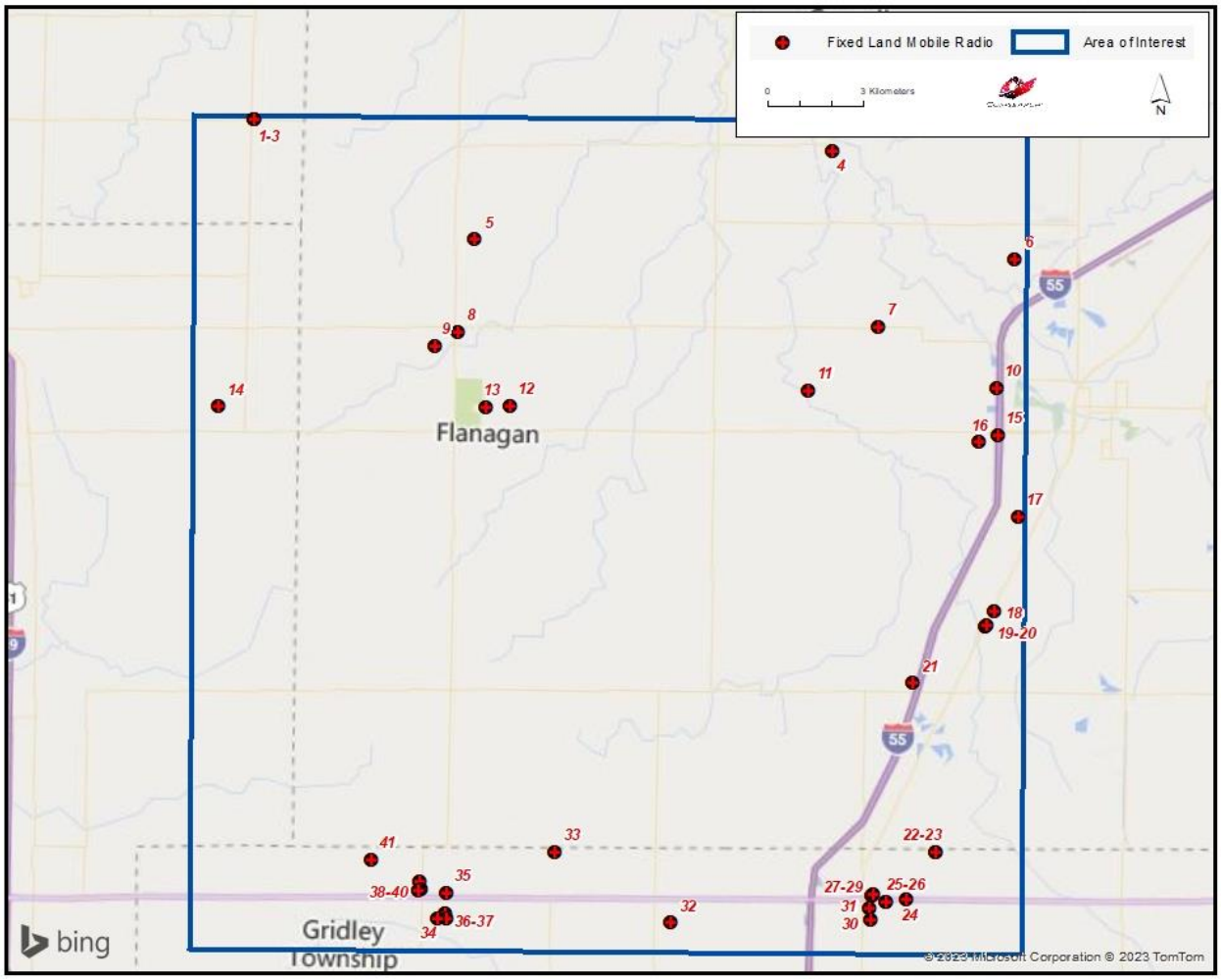

Figure 2: Land Mobile & Emergency Service Sites in Area of Interest

Figure 2 identifies forty-one site-based licenses in the Panther Grove 2 wind project area of interest. Specific information about these sites is provided in Table 1.

ID	Call Sign	Frequency Band (MHz)	Licensee	Antenna Height AGL (m)	Latitude (NAD83)	Longitude (NAD83)
1	WQJF824	450-470	Illinois American Water Company	30	40.957083	-88.949472
2	WQFH642	450-470	DANA FIRE PROTECTION DISTRICT	13.3	40.957000	-88.949528
3	WQFH642	150-174	DANA FIRE PROTECTION DISTRICT	15	40.957000	-88.949528
4	WRVB270	150-174	Erschen, Frank	13	40.951667	-88.735278
5	WNSZ338	150-174	RIENTS, JEFF	20	40.924750	-88.866750
6	WQQV800	450-470	LIVINGSTON LANDFILL DIVISION OF REPUBLIC SERVICES	10.6	40.922250	-88.666722
7	WQTF323	150-174	DUFFY, STEVE	18	40.902472	-88.716833
8	WNLP353	150-174	KOELLER, JAN	21	40.898639	-88.872306
9	WNUG260	150-174	HARMS, JAMES E	18	40.894750	-88.880639
10	WPEM984	150-174	Bressner, Roger	11	40.886139	-88.672833
11	WPRG706	800/900	Illinois Cooperative dba Clear Talk	133.5	40.884222	-88.742444
12	KNCC258	150-174	FLANAGAN GRAYMONT AMBULANCE SERV	18	40.878194	-88.852528
13	WNQR977	150-174	FLANAGAN FERTILIZER COMPANY INC	15	40.877806	-88.861194
14	WQQB202	450-470	Martin Sullivan Inc.	47	40.876278	-88.960250
15	KNIK458	150-174	ST. JAMES HOSPITAL	36.6	40.872778	-88.671944
16	WQHG537	72-76	St. James John W. Albrecht Medical Center	18.1	40.870778	-88.678889
17	WQUU959	150-174	HAAS, JEREMY	14	40.850000	-88.663889
18	WQKU939	150-174	Union Pacific Railroad Company	3	40.823278	-88.671889
19	WPMJ444	150-174	UNION PACIFIC RAILROAD COMPANY	4	40.819278	-88.674583
20	KFX965	150-174	UNION PACIFIC RAILROAD COMPANY	33.5	40.818917	-88.675056
21	WNDQ640	150-174	ZIMMERMAN, HOWARD	16	40.802806	-88.701444

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

ID	Call Sign	Frequency Band (MHz)	Licensee	Antenna Height AGL (m)	Latitude (NAD83)	Longitude (NAD83)
22	KSU993	150-174	Haney, Daryl	27	40.755583	-88.691722
23	WNPY659	450-470	Haney, Daryl	6	40.755583	-88.691722
24	WPQE263	150-174	JACOBS, DONALD D	10	40.741972	-88.702278
25	KSI382	150-174	CHENOA COMMUNITY FIRE PROTECTION DISTRICT	23	40.741111	-88.710000
26	KZV881	150-174, 450-470	CHENOA, CITY OF	12	40.741111	-88.710000
27	KUI731	150-174	CHENOA, CITY OF	8	40.743361	-88.714778
28	KNHG723	150-174	CHENOA, CITY OF	24	40.743083	-88.715333
29	KUI731	150-174	CHENOA, CITY OF	24	40.743083	-88.715333
30	WRWK381	150-174	PRAIRIE CENTRAL SCHOOL DISTRICT 8	14	40.736111	-88.715556
31	KSU993	150-174	Haney, Daryl	40	40.739472	-88.716167
32	WNPY659	450-470	Haney, Daryl	53	40.734194	-88.789222
33	WPKT450	450-470	A BEEP, LLC	125	40.753333	-88.832500
34	WPCR931	150-174	GRIDLEY, VILLAGE OF	46.3	40.734194	-88.871944
35	WQSD381	450-470	EL PASO-GRIDLEY CUSD #11	36.6	40.741389	-88.872389
36	WPCR931	150-174	GRIDLEY, VILLAGE OF	9	40.735583	-88.872556
37	WQPY262	450-470	BRANDT CONSOLIDATED,INC.	44	40.734194	-88.875056
38	WQDN329	150-174	GRIDLEY FIRE PROTECTION DISTRICT	4	40.742222	-88.881389
39	WNQU290	150-174	GRIDLEY, TOWNSHIP OF	18	40.744472	-88.882000
40	WQUX442	150-174	GRIDLEY FIRE PROTECTION DISTRICT	15.2	40.741889	-88.882417
41	WNSK285	150-174	KRUG, HAROLD	22	40.750028	-88.900361

Table 1: Land Mobile & Emergency Service Sites in Area of Interest

Mobile Licenses

In addition to the fixed-site licenses above, 576 mobile licenses defined by center point and radius were found to intersect the Panther Grove 2 wind project area. Appendix A contains a tabular summary of these stations.

Area-Wide Licenses

The regional area-wide licenses were compiled from FCC data sources and identified for each county intersected by the wind energy project area. The Panther Grove 2 wind project is located in Livingston County, Illinois, part of Public Safety Region #13, which contains all the counties in Illinois, excluding the greater Chicago metropolitan area. The regional public safety operations are overseen by the entity listed below.

William J. Carter
Chairperson, Public Safety Region #13
Illinois Department of Public Health
122 South Michigan Avenue, 7th Floor
Chicago, IL 60603
phone: 312-814-5208
email: billy.carter@illinois.gov

The chairperson for Region #13 serves as the representative for all public safety entities in the area and is responsible for coordinating current and future public safety use in the wireless spectrum. In the bands licensed by the FCC for area-wide first responders, which include 220 MHz, 700 MHz, 800 MHz and 4.9 GHz, as well as the traditional Part 90 public safety pool of frequencies, fifty-three licenses were found for the State of Illinois and three for the County of Livingston (see Table 2). These area-wide licenses are designated for mobile use only.

ID	Licensee	Area of Operation	Frequency Band (MHz)
1	ADVANCED MEDICAL TRANSPORT OF CENTRAL ILLINOIS	Statewide: IL	150-174
2	ALEXIS NORTH HENDERSON AMBULANCE SERVICE	Statewide: IL	150-174
3	AMERICAN MEDICAL RESPONSE INC	Statewide: IL	150-174, 450-470
4	American National Red Cross	Statewide: IL	25-50
5	Beecher Fire Protection District	Statewide: IL	150-174
6	Buncombe Fire Department	Statewide: IL	150-174
7	BUNKER HILL, CITY OF	Statewide: IL	150-174
8	CARLINVILLE, CITY OF	Statewide: IL	150-174

ID	Licensee	Area of Operation	Frequency Band (MHz)
9	CAVE EASTERN FIRE PROTECTION DISTRICT	Statewide: IL	150-174
10	City of Charleston	Statewide: IL	150-174
11	City of Chicago Heights Police Department	Statewide: IL	4940-4990
12	Deaconess regional Healthcare Services Illinois, Inc	Statewide: IL	150-174
13	DOWNERS GROVE, VILLAGE OF	Statewide: IL	150-174, 450-470
14	EVERGREEN PARK, VILLAGE OF	Statewide: IL	150-174
15	Farina, Village of	Statewide: IL	150-174
16	Findlay Fire Protection District	Statewide: IL	150-174
17	GALESBURG HOSPITALS AMBULANCE SERVICE	Statewide: IL	150-174
18	GALVA, CITY OF	Statewide: IL	150-174
19	GLENDALE HEIGHTS, VILLAGE OF	Statewide: IL	150-174
20	ILLINI NON EMERGENCY PATIENT TRANSPORT	Statewide: IL	150-174
21	Illinois Law Enforcement Alarm System	Statewide: IL	0-10
22	ILLINOIS LAW ENFORCEMENT ALARM SYSTEM (ILEAS)	Statewide: IL	25-50, 150-174, 450-470, 800/900
23	Illinois State Toll Highway Authority	Statewide: IL	0-10, 450-470, 800/900, 4940-4990
24	Illinois, State of	Statewide: IL	0-10, 25-50, 150-174, 150-174, 406-413, 421-430, 769-775/799-805, 800/900, 2450-2500
25	Illinois, State of Department of Transportation	Statewide: IL	0-10, 25-50, 150-174
26	JERSEY, COUNTY OF SHERIFF DEPARTMENT	Statewide: IL	150-174
27	JOHNSON COUNTY 9 1 1 ETSB	Statewide: IL	150-174
28	Lakeside EMS, LLC	Statewide: IL	150-174
29	LIVINGSTON COUNTY SHERIFF'S DEPT	Countywide: LIVINGSTON, IL	450-470, 800/900
30	LJH Ambulance dba Ambulnz by DocGo	Statewide: IL	150-174
31	Maine Township Emergency Management Agency	Statewide: IL	25-50, 150-174
32	MEDICONE MEDICAL RESPONSE	Statewide: IL	150-174

ID	Licensee	Area of Operation	Frequency Band (MHz)
33	METAMORA, CITY OF	Statewide: IL	150-174
34	MIDLOTHIAN, VILLAGE OF	Statewide: IL	150-174
35	MORGAN COUNTY ESDA	Statewide: IL	150-174
36	MOUNT ZION FIRE PROTECTION DISTRICT	Statewide: IL	150-174
37	MURPHYSBORO, CITY OF	Statewide: IL	150-174
38	MUTUAL AID BOX ALARM SYSTEM - IL	Statewide: IL	25-50, 150-174, 450-470
39	NATIONAL SKI PATROL SYSTEM INC	Statewide: IL	150-174
40	ONEIDA WATAGA FIRE PROTECTION DISTRICT	Statewide: IL	150-174
41	ORION FIRE PROTECTION DISTRICT	Statewide: IL	150-174
42	PARATECH AMBULANCE SERVICE INC	Statewide: IL	150-174
43	PATOKA FIRE PROTECTION DIST IL	Statewide: IL	150-174
44	RuralMed, LLC	Statewide: IL	150-174
45	Search And Rescue Mutual Aid (SARMA)	Statewide: IL	150-174
46	SOUTH EAST LIVINGSTON COUNTY AMBULANCE SERVICE, INC.	Countywide: LIVINGSTON, IL	150-174
47	SOUTH HOLLAND, VILLAGE OF	Statewide: IL	150-174
48	Stickney, Village of	Statewide: IL	150-174
49	Superior Air Ground Ambulance Inc.	Statewide: IL	150-174
50	United Life Care Ambulance Service Inc	Statewide: IL	150-174
51	United Medical Response, LLC	Statewide: IL	150-174
52	Vermilion Valley Regional ETSB	Countywide: LIVINGSTON, IL	150-174, 450-470
53	Village of University Park	Statewide: IL	150-174
54	WAYNE COUNTY AMBULANCE SERVICE	Statewide: IL	150-174
55	WEST CITY, VILLAGE OF	Statewide: IL	150-174
56	WILLIAMSFIELD FIRE PROTECTION DIST	Statewide: IL	150-174

Table 2: Regional Licenses

E911 Operators

Wireless operators are granted area-wide licenses from the FCC to deploy their cellular networks, which often include handsets with E911 capabilities. Since mobile phone market boundaries differ from service to service, we disaggregated the carriers' licensed areas down to the county level. We have identified the type of service for each carrier in Livingston County, Illinois, in Table 3.

Mobile Phone Carrier	Service[2]
AT&T	700 MHz, AWS, Cellular, PCS, WCS
DISH Network	700 MHz, AWS
MTCO Communications	Cellular
T-Mobile	700 MHz, AWS, PCS
US Cellular	700 MHz
Verizon	700 MHz, AWS, PCS

Table 3: Mobile Phone Carriers in Area of Interest with E911 Service

3. Impact Assessment

The first responder, industrial/business land mobile sites, area-wide public safety, and commercial E-911 communications as described in this report are typically unaffected by the presence of wind turbines, and we do not anticipate any significant harmful effect to these services in the Panther Grove 2 wind project area. Although each of these services operates in different frequency ranges and provides different types of service including voice, video and data applications, there is commonality among these different networks with regard to the impact of wind turbines on their service. Each of these networks is designed to operate reliably in a non-line-of-sight (NLOS) environment. Many land mobile systems are designed with multiple base transmitter stations covering a large geographic area with overlap between adjacent transmitter sites in order to provide handoff between cells. Therefore, any signal blockage caused by the wind turbines does not materially degrade the reception because the end user is likely receiving signals from multiple transmitter locations. Additionally, the frequencies of operation for these services have characteristics that allow the signal to

[2] AWS: Advanced Wireless Service at 1.7/2.1 GHz
CELL: Cellular Service at 800 MHz
PCS: Personal Communication Service at 1.9 GHz
WCS: Wireless Communications Service at 2.3 GHz
700 MHz: Lower 700 MHz Service

propagate through wind turbines. As a result, very little, if any, change in their coverage should occur when the wind turbines are installed.

When planning the wind energy turbine locations in the area of interest, a conservative approach would dictate not locating any turbines within 77.5 meters of land mobile fixed-base stations to avoid any possible impact to the communications services provided by these stations. This distance is based on FCC interference emissions from electrical devices in the land mobile frequency bands. As long as the turbines are located more than 77.5 meters from the land mobile stations, they will meet the setback distance criteria for FCC interference emissions in the land mobile bands.

4. Recommendations

In the event that a public safety entity believes its coverage has been compromised by the presence of the wind energy facility, it has many options to improve its signal coverage to the area through optimization of a nearby base station or even adding a repeater site. Utility towers, meteorological towers or even the turbine towers within the wind project area can serve as the platform for a base station or repeater site.

5. Contact

For questions or information regarding the Land Mobile & Emergency Services Report, please contact:

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Email:	David.Meyer@CommScope.com
Web site:	www.comsearch.com

Appendix A

ID	Call Sign	Frequency Band (MHz)	Licensee	Mobile Area Radius (km)	Latitude (NAD83)	Longitude (NAD83)
1	WPKT450	450-470	A BEEP, LLC	32	40.753333	-88.832500
2	WPMS678	25-50	A C JONES TRUCKING INC	161	39.991167	-90.257056
3	WRZH646	150-174	Abry, Jim	40	41.020000	-88.563611
4	WPAJ404	450-470	AFFILIATED CUSTOMER SERVICE	121	41.797528	-87.954778
5	WQVS239	450-470	AG VIEW FS, INC.	32	41.029944	-89.223444
6	WQOX297	450-470	AHW LLC	32	41.158194	-88.652028
7	KB70306	450-470	ALARM DETECTION SYSTEMS INC	113	41.779750	-88.295917
8	KCX586	25-50	ALARM DETECTION SYSTEMS INC	113	41.779750	-88.296194
9	WNCG283	450-470	ALARM DETECTION SYSTEMS, INC.	112	41.779750	-88.296194
10	WPKN431	450-470	ALARM DETECTION SYSTEMS, INC.	120	41.780306	-88.296750
11	WPXK705	450-470	Alarm Detection Systems, Inc.	120	41.625361	-87.728417
12	WPED653	450-470	ALPHA PRIME WIRELESS COMMUNICATIONS	113	41.530306	-87.805056
13	WNQJ842	800/900	Ameren Services Company	402	38.669194	-92.208528
14	WPIX671	800/900	Ameren Services Company	113	40.791972	-89.619806
15	WPLY438	800/900	Ameren Services Company	113	41.063083	-89.585639
16	WPMP607	800/900	Ameren Services Company	113	40.794194	-89.198417
17	WQYG488	450-470	AMERICAN BUILDINGS COMPANY	32	40.738583	-88.974111
18	WNXH406	450-470	American National Red Cross	80	41.307500	-88.146111
19	WQVN419	450-470	AMERICAN TIME & SIGNAL CO.	20	41.060667	-88.818028
20	WPFZ494	150-174	AMITY, TOWNSHIP OF	32	40.988917	-88.740333
21	WQLV439	450-470	Andy Wurm Tire & Wheel Co Inc	320	38.740667	-90.304083
22	WRWE995	450-470	Apostolic Christian Church	32	40.778556	-89.240806
23	KD23109	150-174	Archer Daniels Midland Company	121	41.357250	-88.421167
24	WPPX534	150-174	Archer Daniels Midland Company	113	41.313361	-89.198139

ID	Call Sign	Frequency Band (MHz)	Licensee	Mobile Area Radius (km)	Latitude (NAD83)	Longitude (NAD83)
25	WQPP409	450-470	AREZ, LLC	32	40.941250	-89.273444
26	WQSU430	450-470	ATKINS, DEAN	32	40.755556	-88.606944
27	WRJH392	150-174	B&B Ag. Products, Inc.	40	40.856667	-88.806667
28	WPWA437	150-174	BAHLER FARMS	16	40.686111	-88.593889
29	WPUT980	450-470	BARBECK COMMUNICATIONS GROUP INC.	32	40.483056	-88.995278
30	WQTH581	450-470	BARNARD, TED	32	40.755583	-88.607000
31	WQTB800	150-174	Bauman Farms	40	40.815167	-89.021194
32	WQRC450	150-174	BCS LLC	40	40.486333	-88.632639
33	WQRC450	150-174	BCS LLC	40	40.744222	-88.623139
34	WPMZ946	450-470	BEARDSLEY, CRAIG L	250	41.694194	-87.687556
35	KBE854	150-174	BECKS SUPERIOR HYBRIDS INC	32	40.773333	-88.985361
36	KXV841	25-50	BELL ENTERPRISES INC	64	40.637250	-89.358417
37	WPOG356	150-174	BENNETT, DOUGLAS V	40	40.477806	-88.403389
38	WPTN613	150-174	BENSON COMMUNITY FIRE PROTECTION DISTRICT	32	40.842250	-89.101472
39	WQYG630	150-174	BERG FARMS	80	41.501111	-88.386667
40	WRAS995	450-470	BIRKENBEIL, JASON	32	40.574778	-88.445889
41	WRAS995	450-470	BIRKENBEIL, JASON	32	40.628333	-88.386583
42	WQFB702	25-50, 150-174, 450-470, 470-512, 800/900	B-K ELECTRIC INC	300	39.713278	-90.722639
43	WSN404	25-50	BLEIGH CONSTRUCTION COMPANY	169	39.930889	-90.332056
44	WRDG956	450-470	BLOOMINGTON COUNTRY CLUB	32	40.484917	-88.968444
45	KUH383	450-470	BLOOMINGTON NORMAL PUBLIC TRANSIT SYSTEM	32	40.475028	-88.993139
46	KVT384	450-470	BLOOMINGTON NORMAL WATER RECLAMATION DISTRICT	32	40.453611	-88.962778
47	WPKE365	450-470	BLOOMINGTON SCHOOL DISTRICT 87	32	40.480028	-88.997306

ID	Call Sign	Frequency Band (MHz)	Licensee	Mobile Area Radius (km)	Latitude (NAD83)	Longitude (NAD83)
48	WQKI719	150-174, 450-470	Bloomington School District 87	32	40.486611	-88.977778
49	KD4839	150-174	BLOOMINGTON, CITY OF	40	40.466667	-89.000000
50	KSD332	150-174	BLOOMINGTON, CITY OF	32	40.479833	-88.993167
51	KSD332	150-174	BLOOMINGTON, CITY OF	32	40.475028	-88.993139
52	WPBK497	450-470	BLOOMINGTON, CITY OF	32	40.468556	-89.006194
53	WPDR889	150-174	BLOOMINGTON, CITY OF	32	40.466694	-89.000083
54	WPIX238	800/900	BLOOMINGTON, CITY OF	32	40.477556	-88.993667
55	WPTR821	450-470	BLOOMINGTON, CITY OF	32	40.480000	-88.992889
56	WPTR821	450-470	BLOOMINGTON, CITY OF	32	40.480000	-88.991944
57	WQHD838	450-470	BLOOMINGTON, CITY OF	32	40.449667	-89.005139
58	WQHD838	450-470	BLOOMINGTON, CITY OF	32	40.461056	-88.993000
59	WRBP975	800/900	BLOOMINGTON,CITY OF	8	40.658556	-88.934778
60	KBB346	150-174	BNSF Railway Co.	40	41.002333	-89.122639
61	KNCT660	150-174	BNSF Railway Co.	40	41.157167	-88.657833
62	WNAH497	450-470	Bogner 634, Denny A	48	41.075028	-89.466472
63	WQLB828	150-174	BOUCHER, MATTHEW	40	41.118056	-88.500000
64	WQTD624	150-174	BRAASCH, BOB	40	40.416944	-88.501667
65	WQZN274	450-470	BRADLE, NATHAN D	24	40.739778	-89.138833
66	WPEY520	150-174	BRADLE, ROGER	72	40.729194	-89.135083
67	WQPY263	450-470	BRANDT CONSOLIDATED, INC.	32	40.553361	-88.907861
68	WQPY262	450-470	BRANDT CONSOLIDATED,INC.	32	40.734194	-88.875056
69	WQPY262	450-470	BRANDT CONSOLIDATED,INC.	32	40.639194	-88.776167
70	WQPY262	450-470	BRANDT CONSOLIDATED,INC.	32	40.602806	-88.480611
71	WQUP972	150-174	BRESSNER, JEFF	45	40.877250	-88.772556
72	WPEM984	150-174	Bressner, Roger	40	40.886139	-88.672833

ID	Call Sign	Frequency Band (MHz)	Licensee	Mobile Area Radius (km)	Latitude (NAD83)	Longitude (NAD83)
73	KD28606	450-470	BRINK'S INCORPORATED	121	39.850028	-88.950083
74	KD28607	450-470	BRINK'S INCORPORATED	121	40.950028	-90.366806
75	KD28608	450-470	BRINK'S INCORPORATED	121	40.695028	-89.592611
76	KD28610	450-470	BRINK'S INCORPORATED	121	39.799500	-89.647611
77	KD28612	450-470	BRINK'S INCORPORATED	121	41.783361	-89.191750
78	KD28613	450-470	BRINK'S INCORPORATED	121	40.783361	-88.250056
79	KNIA629	150-174	BROWN, GARY DBA G & J FARMS INC	32	40.820306	-88.383944
80	KZZ283	150-174	BUCKLEY FIRE PROTECTION DISTRICT	64	40.600028	-88.038917
81	KNIY210	150-174	BUREAU, COUNTY	80	41.370306	-89.465083
82	WNKR589	150-174	BUSCH, KENNETH	48	41.208917	-89.041750
83	WPEC498	450-470	CAILTEUX, KENNETH	80	40.930306	-87.932250
84	KSO911	25-50, 150-174, 450-470	Carlock Fire Protection District	32	40.582250	-89.138972
85	KNBS746	450-470	CATERPILLAR OF DELAWARE INC	48	40.618361	-89.453694
86	WPXW383	800/900	CATERPILLAR OF DELAWARE INC	48	40.618361	-89.453694
87	WPXW383	800/900	CATERPILLAR OF DELAWARE INC	48	40.618639	-89.447583
88	WQR410	450-470	CATERPILLAR OF DELAWARE, INC.	16	40.885583	-88.652278
89	WQT290	450-470	Caterpillar of Delaware, Inc.	10	40.885583	-88.652278
90	KSI382	150-174	CHENOA COMMUNITY FIRE PROTECTION DISTRICT	40	40.741111	-88.710000
91	KUI731	150-174	CHENOA, CITY OF	40	40.743083	-88.715333
92	KZV881	150-174, 450-470	CHENOA, CITY OF	40	40.741111	-88.710000
93	WQNZ370	150-174	CHIEF REDI-MIX,INC.	40	40.882778	-88.619444
94	KZV871	150-174	Chillicothe Township	48	40.927806	-89.494528
95	WQVA715	450-470	CLARK, BRENT A	32	40.960944	-88.601417
96	WNCD378	450-470	COLESON, DALE	48	41.070583	-89.268417

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97	WPGE359	450-470	COLLEGE OF DU PAGE	121	41.843361	-88.083389
98	WRMP752	800/900	Commonwealth Edison Company	113	41.759194	-89.610722
99	WRMP752	800/900	Commonwealth Edison Company	113	41.687250	-88.477556
100	WRMP758	800/900	Commonwealth Edison Company	113	41.880556	-88.751389
101	WRMP758	800/900	Commonwealth Edison Company	113	41.388333	-88.281111
102	WRMP758	800/900	Commonwealth Edison Company	113	41.624167	-87.932222
103	WRMP758	800/900	Commonwealth Edison Company	113	41.208889	-87.913333
104	WRMT870	800/900	Commonwealth Edison Company	113	41.041667	-88.765000
105	WRMZ768	800/900	Commonwealth Edison Company	113	41.719444	-89.067222
106	WRMZ768	800/900	Commonwealth Edison Company	113	41.008056	-88.265833
107	WPAS564	450-470	COMMUNITY UNIT SCHOOL DISTRICT 140	32	40.630917	-89.282944
108	WPAS564	150-174, 450-470	COMMUNITY UNIT SCHOOL DISTRICT 140	40	40.718917	-89.273417
109	WPAS564	450-470	COMMUNITY UNIT SCHOOL DISTRICT 140	32	40.700944	-89.270917
110	WPAS564	450-470	COMMUNITY UNIT SCHOOL DISTRICT 140	32	40.617500	-89.200639
111	WPCP881	150-174	CONGERVILLE EMERGENCY MEDICAL TRANSPORT	48	40.615306	-89.205083
112	WQQZ995	150-174	CONNESS, TOM	40	41.105778	-88.947917
113	WNCL915	216-220	Constellation Energy Generation, LLC	121	41.298361	-88.434778
114	WNPK678	800/900	Constellation Energy Generation, LLC	113	41.389750	-88.270333
115	WQEL763	800/900	COOK DUPAGE TRANSPORTATION INC	113	41.512500	-88.255556
116	KTE868	150-174	CORN BELT ENERGY CORPORATION	80	40.417667	-88.906500
117	WNVG232	150-174	Corteva Agriscience LLC	5	40.737806	-89.000917
118	WPGS412	450-470	Corteva Agriscience LLC	16	40.737806	-89.000917
119	WPHV625	450-470	Corteva Agriscience LLC	16	40.737806	-89.001472
120	WPUB488	800/900	Craig, Larry W	113	39.851667	-89.099444
121	KW8774	150-174	CULLOM FIRE PROTECTION DISTRICT	48	40.878917	-88.255333

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122	WPGQ917	450-470	D & I ELECTRONICS, INC.	121	41.564750	-88.219778
123	WRWX643	150-174, 450-470	Dale, Township of	40	40.408917	-89.063972
124	WRWX643	150-174	Dale, Township of	32	40.475528	-89.034167
125	WQFH642	150-174	DANA FIRE PROTECTION DISTRICT	24	40.957000	-88.949528
126	WQFH642	450-470	DANA FIRE PROTECTION DISTRICT	32	40.957000	-88.949528
127	KVM538	150-174	DANFORTH, TOWNSHIP OF	64	40.824472	-87.976972
128	KNIF947	150-174	DANVERS COMMUNITY FIRE PROTECTION DIST	40	40.529194	-89.180639
129	WRYY757	450-470	DANVERS FARMERS ELEVATOR COMPANY	32	40.527028	-89.177639
130	WRPN290	150-174	DANVERS TOWNSHIP OF	32	40.526944	-89.173611
131	WQBY377	450-470	Darnall Concrete Products	32	40.517611	-88.976306
132	WQHF679	450-470	DEAL, SAM	32	40.527222	-89.177778
133	WQGH690	150-174	DEER CREEK POLICE DEPARTMENT	40	40.629861	-89.331694
134	WPDT431	450-470	DEFENBAUGH, ANN	64	41.088917	-88.688389
135	WQSB645	150-174	DIEMER, DALE D	40	40.945556	-88.453333
136	WNLV656	150-174	DOWNS COMMUNITY FIRE PROTECTION DISTRICT	40	40.397806	-88.877861
137	WQTF323	150-174	DUFFY, STEVE	40	40.902472	-88.716833
138	WRAS761	450-470	Duffy-Baier-Snedecor Ambulance Service, LLC	32	40.881167	-88.628417
139	WQPI750	450-470	DURDAN MR, JUSTIN	32	41.149167	-88.970833
140	WPMN729	150-174	DWIGHT, VILLAGE OF	40	41.092528	-88.429500
141	WRFD599	450-470	East Peoria Elementary School Dist. 86	80	40.663972	-89.572278
142	WNKP742	150-174, 450-470	EASTERN ILLINI ELECTRIC COOPERATIVE	129	40.453083	-88.103111
143	KD42341	150-174	EASTERN MARSHALL COUNTY EMS	80	41.050028	-89.049250
144	WQKU965	150-174	EL PASO FIRE PROT. DIST. DBA EL PASO EMERGENCY SQUAD	32	40.736389	-89.008306
145	WQKU227	150-174	EL PASO FIRE PROTECTION DISTRICT	32	40.738611	-89.011944
146	WQMQ484	150-174	EL PASO TOWNSHIP ROAD DISTRICT	32	40.736417	-89.016944

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147	KTC925	25-50, 150-174	EL PASO, CITY OF	17	40.738361	-89.017306
148	WPJG635	450-470	EL PASO, CITY OF	20	40.737528	-89.005639
149	WQSD381	450-470	EL PASO-GRIDLEY CUSD #11	32	40.744083	-89.021611
150	WQSD381	450-470	EL PASO-GRIDLEY CUSD #11	32	40.741389	-88.872389
151	KNIG682	150-174	Elliot, Randall	72	40.993083	-87.972278
152	WPDU891	450-470	ELSASSER, ROSS A	64	41.031694	-89.590083
153	WREM265	150-174	EMINGTON - CAMPUS FIRE PROTECTION DISTRICT	40	41.024889	-88.307944
154	WQRD828	450-470	Enbridge Energy Company, Inc.	32	40.945111	-88.646000
155	WPHA781	800/900	ENERSTAR POWER COMPANY	113	41.301417	-88.953139
156	WRVB270	150-174	Erschen, Frank	40	40.951667	-88.735278
157	WPIK959	450-470	ESP Wireless Technology Group, Inc	113	41.496417	-88.298944
158	WRKU312	800/900	Estate of Terry J Mack	113	41.610278	-88.439167
159	WQVV829	450-470	Euramax International Inc	3	40.739694	-88.930778
160	WQTT712	450-470	EUREKA COLLEGE	32	40.715722	-89.263028
161	KGC960	450-470	EUREKA, CITY OF	32	40.722778	-89.273833
162	KGC960	25-50, 150-174	EUREKA, CITY OF	40	40.722778	-89.273833
163	WQVE754	450-470	FAIRBURY FIRE PROTECTION DISTRICT	32	40.747056	-88.518194
164	WQRD732	450-470	FARMERS COOP ASSOCIATION	32	41.036417	-89.226111
165	WRVH880	800/900	FBA Corporation	113	41.496417	-88.298944
166	WRVH880	800/900	FBA Corporation	113	41.565833	-88.062222
167	WQTN610	150-174	FEHR, DARREN	40	40.982194	-88.644861
168	WPEW492	450-470	FEVER, RONALD	48	40.701417	-89.005639
169	KSF842	150-174	FIRST STUDENT INC	40	41.238639	-88.830083
170	WNJX878	150-174	First Student Inc	64	40.461139	-88.990361
171	WPBB689	800/900	First Student Inc	64	40.619472	-89.572333

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172	WNQR977	150-174	FLANAGAN FERTILIZER COMPANY INC	40	40.877806	-88.861194
173	WQNZ372	150-174	FORREST REDI- MIX,INC.	40	40.737500	-88.416667
174	WQPP891	150-174	FOX, BRODY	121	40.497167	-87.417083
175	WQTL950	150-174	FOX, RICH	40	40.991250	-88.412917
176	WPWY702	800/900	Francis Ms., Bini	113	40.180861	-88.317833
177	WPKL271	450-470	FSS Technologies, L.L.C.	120	41.755583	-87.956444
178	WPZE770	450-470	FURROW FARMS	32	40.761139	-89.030639
179	WNVW473	150-174	GARBER, JOHN J	48	40.821417	-89.325083
180	WRZP608	450-470	GENSLER FARMS INC	32	41.029778	-89.209889
181	WQYF694	150-174	Getty, David	35	40.543083	-88.716444
182	WRCB359	450-470	Global Wind Services US Inc.	32	40.684972	-88.659806
183	WQWH819	150-174	GOODFIELD, VILLAGE OF	32	40.628389	-89.275472
184	WROP929	150-174	GRAF FARMS DBA GRAF LAWN CARE & LANDSCAPING	40	40.467944	-88.860028
185	WPGH577	450-470	GRAINLAND COOPERATIVE	80	40.744472	-89.134806
186	WQZU398	150-174	GRAND RIDGE GRADE SCHOOL	40	41.237778	-88.835556
187	WPQB968	450-470	GRANDVIEW SERVICE COMPANY	32	41.033083	-89.222583
188	WQMI710	470-512	GRAY TELEVISION LICENSEE, LLC	270	41.528639	-90.573444
189	KNBC405	150-174	GREENE, TOWNSHIP OF	16	40.823917	-89.073972
190	WPZW710	150-174, 450-470	GREMLEY & BIEDERMANN	160	41.962500	-87.732500
191	WPJG816	150-174	GRIDLEY EMERGENCY MEDICAL SERVICE	24	40.750028	-88.883389
192	WQDN329	150-174	GRIDLEY FIRE PROTECTION DISTRICT	16	40.742222	-88.881389
193	WQUX442	150-174	GRIDLEY FIRE PROTECTION DISTRICT	24	40.741889	-88.882417
194	WNQU290	150-174	GRIDLEY, TOWNSHIP OF	48	40.744472	-88.882000
195	WPCR931	150-174	GRIDLEY, VILLAGE OF	20	40.735583	-88.872556
196	WPCR931	150-174	GRIDLEY, VILLAGE OF	20	40.734194	-88.871944

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197	KSE889	25-50	GROHNE CONCRETE PRODUCTS COMPANY	113	39.832528	-88.955083
198	WPEP959	25-50	GRUNDY, COUNTY OF	113	41.371139	-88.432833
199	WPPD445	150-174	GUNDERSEN LUTHERAN MEDICAL CENTER	600	43.794417	-91.249583
200	WQUU959	150-174	HAAS, JEREMY	40	40.850000	-88.663889
201	WPBS287	450-470	Hagenbuch Hag, Henry	64	41.454194	-88.961750
202	KSU993	150-174	Haney, Daryl	56	40.755583	-88.691722
203	WNPY659	450-470	Haney, Daryl	56	40.734194	-88.789222
204	WNBS407	450-470	HANSEN, DONALD	56	40.576694	-88.243111
205	WQXD817	150-174	Harbison, Brandon	40	40.784333	-89.087528
206	WPZZ858	450-470	Hardee's Food Systems, LLC	121	40.138556	-87.630333
207	WROS636	150-174	Harms, Daniel	40	40.784528	-89.354722
208	WQZX257	450-470	HARMS, DANIEL J	40	40.662778	-88.561556
209	WNUG260	150-174	HARMS, JAMES E	32	40.894750	-88.880639
210	WRKR329	150-174	Harms, Paul E	40	40.803250	-88.439528
211	WPGX814	150-174	HARMS, RONALD J	48	41.023917	-88.894528
212	WRNS818	150-174	Harrison, David	40	40.704167	-88.658889
213	WQKZ728	150-174	HARTMAN, JOHN	48	40.686111	-88.484722
214	KSS291	450-470	HARTZOLD, JOE B	48	40.510306	-89.127306
215	WPDT375	450-470	HARVEY STAHL & WIELAND BROTHERS	80	40.932250	-89.689000
216	WREX928	450-470	HEARTLAND COMMUNITY COLLEGE	32	40.535111	-89.014194
217	WQU866	150-174	HEINS, DORREN	32	40.726417	-88.652833
218	WQI355	150-174	HELENA AGRI-ENTERPRISES, LLC	121	41.002250	-89.132028
219	WPEY269	150-174	HERITAGE FS INC	121	40.572250	-88.247278
220	WPEY269	150-174	HERITAGE FS INC	121	40.569167	-88.247111
221	WPEY269	150-174	HERITAGE FS INC	121	40.750583	-87.996694

ID	Call Sign	Frequency Band (MHz)	Licensee	Mobile Area Radius (km)	Latitude (NAD83)	Longitude (NAD83)
222	WPEY269	150-174	HERITAGE FS INC	121	40.768917	-87.922528
223	WPEY269	150-174	HERITAGE FS INC	121	40.555306	-87.885306
224	WPEY269	150-174	HERITAGE FS INC	121	40.538361	-87.680861
225	WPGV644	150-174	Heritage FS, Inc.	40	40.818500	-88.289250
226	WRXC718	450-470	HERITAGE GRAIN FARMS, INC	32	40.744889	-89.234944
227	WQOS765	450-470	HILL RADIO, INC	32	40.472750	-88.767472
228	WQQF218	450-470	HILL RADIO, INC	32	40.563500	-88.898611
229	WQQF435	450-470	HILL RADIO, INC	32	40.502111	-88.925528
230	WQUY276	150-174	Hill, Richard	40	40.822639	-89.216389
231	WQNM251	450-470	HINTHORN, BRETT	32	40.560806	-88.827167
232	WNNN659	450-470	HINTON, DAVID O	80	40.162528	-88.945917
233	WNWC378	150-174	HOBLIT, FRANK A	80	40.261972	-89.232861
234	KUL525	150-174	Hodel Brothers Farms	32	40.774194	-89.192861
235	KUL525	150-174	Hodel Brothers Farms	80	40.774194	-89.192861
236	WQRM638	25-50	Hoosier Energy Rural Electric Cooperative, Inc.	240	39.093750	-86.914056
237	WQYN709	450-470	Hoosier Energy Rural Electric Cooperative, Inc.	32	40.931500	-88.655472
238	WQRA438	150-174	HUDSON, TOWNSHIP OF	16	40.606361	-88.994000
239	WQHN319	150-174	IFFT, MATTHEW D	80	40.752778	-88.325000
240	KSD939	800/900	Illinois American Water Company	56	40.735028	-89.568417
241	WQKM894	450-470	ILLINOIS CENTRAL SCHOOL BUS LLC	32	40.469889	-88.977750
242	WQWF517	450-470	ILLINOIS CENTRAL SCHOOL BUS LLC	32	41.018611	-88.593889
243	WQCT757	800/900	Illinois Cooperative Association, Inc.	56	41.301389	-88.953056
244	KNET289	800/900	Illinois Cooperative dba Clear Talk	113	41.309750	-88.812306
245	WNMO293	800/900	Illinois Cooperative dba Clear Talk	113	40.793639	-87.754750
246	WNWB448	800/900	Illinois Cooperative dba Clear Talk	113	41.151139	-87.855611

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247	WPBW403	800/900	Illinois Cooperative dba Clear Talk	113	40.149778	-89.371194
248	WPBZ996	800/900	Illinois Cooperative dba Clear Talk	113	41.106694	-87.888389
249	WPEN242	800/900	Illinois Cooperative dba Clear Talk	113	39.951944	-88.831944
250	WPER444	800/900	Illinois Cooperative dba Clear Talk	113	40.126389	-88.290278
251	WPHA805	800/900	Illinois Cooperative dba Clear Talk	113	40.161417	-87.696417
252	WPHA808	800/900	Illinois Cooperative dba Clear Talk	113	40.891417	-88.445889
253	WPJI402	800/900	Illinois Cooperative dba Clear Talk	113	39.952389	-88.832389
254	WPJK853	800/900	Illinois Cooperative dba Clear Talk	113	40.645833	-89.179167
255	WPLY587	800/900	Illinois Cooperative dba Clear Talk	113	40.645833	-89.179167
256	WPLY617	800/900	Illinois Cooperative dba Clear Talk	90	41.301389	-88.953056
257	WPMD703	800/900	Illinois Cooperative dba Clear Talk	113	41.077528	-87.756139
258	WPMD711	800/900	Illinois Cooperative dba Clear Talk	113	39.990333	-89.512889
259	WPMD731	800/900	Illinois Cooperative dba Clear Talk	113	40.891417	-88.445889
260	WPMF885	800/900	Illinois Cooperative dba Clear Talk	113	41.372222	-89.487778
261	WPPA251	800/900	Illinois Cooperative dba Clear Talk	113	41.336972	-88.763972
262	WPPA256	800/900	Illinois Cooperative dba Clear Talk	113	41.871111	-89.020833
263	WPRG706	800/900	Illinois Cooperative dba Clear Talk	113	40.884222	-88.742444
264	WPRG707	800/900	Illinois Cooperative dba Clear Talk	113	41.138889	-87.852194
265	WPRG708	800/900	Illinois Cooperative dba Clear Talk	113	40.793611	-87.754722
266	WPRH230	800/900	Illinois Cooperative dba Clear Talk	113	40.161528	-87.696444
267	WPRM207	800/900	Illinois Cooperative dba Clear Talk	113	39.952389	-88.832389
268	WPSM625	800/900	Illinois Cooperative dba Clear Talk	113	40.508333	-88.987500
269	WPSM641	800/900	Illinois Cooperative dba Clear Talk	113	40.644722	-89.179722
270	WPST700	800/900	Illinois Cooperative dba Clear Talk	113	40.733056	-89.486111
271	WPSU481	800/900	Illinois Cooperative dba Clear Talk	113	40.508333	-88.987500

ID	Call Sign	Frequency Band (MHz)	Licensee	Mobile Area Radius (km)	Latitude (NAD83)	Longitude (NAD83)
272	WPTA328	800/900	Illinois Cooperative dba Clear Talk	113	39.952389	-88.832389
273	WPTB208	800/900	Illinois Cooperative dba Clear Talk	113	39.952389	-88.832389
274	WPTF624	800/900	Illinois Cooperative dba Clear Talk	113	40.126389	-88.290278
275	WPTF927	800/900	Illinois Cooperative dba Clear Talk	112	40.126389	-88.290278
276	WPUI397	800/900	Illinois Cooperative dba Clear Talk	113	40.161528	-87.696444
277	WQTD443	150-174	ILLINOIS COOPERATIVE DBA CLEAR TALK	32	40.644833	-89.179833
278	WQXC660	800/900	Illinois Cooperative dba Clear Talk	64	40.349278	-88.763472
279	WRCN753	800/900	Illinois Cooperative dba Clear Talk	113	40.981611	-90.165194
280	WPET634	450-470	ILLINOIS FARM BUREAU	32	40.497528	-88.956194
281	WNXS419	800/900	ILLINOIS PUBLIC SAFETY AGENCY NETWORK	112.7	40.729750	-89.554806
282	WPNY807	450-470	ILLINOIS WESLEYAN UNIVERSITY	32	40.492556	-88.990306
283	KEO371	150-174	ILLINOIS, STATE OF	64	41.363056	-89.098611
284	KNNU245	150-174	ILLINOIS, STATE OF	145	39.829222	-89.646222
285	WNMM383	450-470	ILLINOIS, STATE OF	48	40.468361	-88.952861
286	WPHS867	800/900	ILLINOIS, STATE OF	20	40.869250	-88.641472
287	WQCT761	800/900	ILLINOIS, STATE OF	32	40.644833	-89.179833
288	WQCW207	800/900	ILLINOIS, STATE OF	32	40.869250	-88.641472
289	WQCX408	800/900	ILLINOIS, STATE OF	32	40.508028	-88.988056
290	WPFU938	450-470	Illinois, State of Department of Transportation	16	40.881139	-88.644222
291	WRNU712	450-470	Immke, Don	48	40.855000	-88.408333
292	WQKF981	150-174	INDIAN GROVE TOWNSHIP	40	40.741972	-88.514222
293	WRJL460	450-470	Invenergy Services, LLC	32	40.643222	-88.723861
294	WPQE263	150-174	JACOBS, DONALD D	25	40.719472	-88.770889
295	WNSP648	450-470	JACOBS, MARY A	48	40.391694	-89.222306
296	WQBV416	150-174	Jehle Bros., Inc.	40	40.878083	-88.269444

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297	WPGS819	150-174	JESSE, RICK	32	41.041694	-89.216750
298	WPJT201	800/900	JOLIET, CITY OF	113	41.524194	-88.085056
299	WQSW631	450-470	JRM Farms LLC	32	41.013000	-89.272639
300	WRWD568	450-470	K BROS LLC	32	41.008556	-88.731611
301	WQTA695	150-174	KAFER TILING & EXCAVATING, INC.	40	40.746139	-88.491806
302	WRFC799	150-174	KAMINKE, TOM	40	40.988056	-88.873056
303	WPUY811	450-470	Keltron Corporation	120	41.672222	-88.004167
304	KBS718	150-174	KENDALL COUNTY CONCRETE INC	120.7	41.500028	-88.500083
305	WPGE449	150-174	KENNELL, LAWRENCE A	40	40.894750	-89.319250
306	WQTB631	150-174	Klendworth Farms	40	40.945389	-89.033889
307	WQSA357	450-470	KOCH, RODNEY	32	41.029167	-89.241944
308	WNLP353	150-174	KOELLER, JAN	56	40.898639	-88.872306
309	KYD498	150-174	KRAFT, ROYCE	32	40.538917	-88.882028
310	WPOE493	450-470	KRAFT, ROYCE C	32	40.538917	-88.882028
311	WNSK285	150-174	KRUG, HAROLD	40	40.750028	-88.900361
312	WPCV359	150-174	LAKE WILDWOOD ASSOCIATION INC	40	41.074833	-89.273000
313	KWK423	150-174	LANDER, WILLIAM A	40	41.125028	-88.838694
314	WNNQ252	450-470	LASSWELL, DARRELL G	48	40.905861	-89.267861
315	WQOK773	450-470	LAZY H INC.	32	40.893306	-88.405889
316	KTW257	150-174	LEXINGTON AMBULANCE SERVICE	24	40.650028	-88.986194
317	WRFA545	450-470	Lexington Chenoa Wind Farm LLC c/o Bright Stalk Wind Farm	32	40.675806	-88.693750
318	KAZ439	150-174	LEXINGTON COMMUNITY FIRE PROT DIST	24	40.650028	-88.786167
319	WQYH422	450-470	Lexington CUSD #7	32	40.644306	-88.780750
320	WQUD203	450-470	LEXINGTON, CITY OF	32	40.640806	-88.780500
321	WQUD941	450-470	LEXINGTON, TOWNSHIP OF	24	40.640806	-88.780500

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322	WPFJ917	450-470	LINDSTROM, RICHARD	48	41.059750	-89.186194
323	WQQV800	450-470	LIVINGSTON LANDFILL DIVISION OF REPUBLIC SERVICES	8	40.922250	-88.666722
324	WRDH542	450-470	LIVINGSTON STONE,INC.	32	40.795778	-88.619806
325	WRDG977	150-174	Lucas Ambulance & Medi-Car Service, Inc.	161	41.760361	-87.860917
326	WRDH564	450-470	LUTJENS, RANDY	16	40.845583	-88.940167
327	WNPZ490	150-174	LYONS, LAWRENCE	64	41.442806	-88.782861
328	WRZS917	150-174	MACKINAW FIRE PROTECTION DISTRICT	40	40.537806	-89.332583
329	KB47727	150-174	MACKINAW, VILLAGE OF	64	40.536972	-89.358972
330	WPUT990	150-174	MARSHALL, COUNTY OF	32	41.033056	-89.222500
331	KNBF445	150-174	MARSHALL, COUNTY OF ESDA	48	41.024472	-89.407583
332	WQQB202	450-470	Martin Sullivan Inc.	32	40.801556	-89.184667
333	WQQB202	450-470	Martin Sullivan Inc.	32	40.527056	-89.178278
334	WQQB202	450-470	Martin Sullivan Inc.	32	40.876278	-88.960250
335	WQQB202	450-470	Martin Sullivan Inc.	32	40.643111	-88.785139
336	KNJP864	450-470	MASCHING, WILLIAM	48	41.037250	-88.305889
337	WPHZ795	450-470	MATERIAL SERVICE CORPORATION	80	41.327806	-88.483389
338	KLK903	150-174	MC ILVAINE, CLIFFORD J	121	41.901972	-88.317861
339	KNDS656	150-174	MC LEAN COUNTY UNIT DISTRICT 5	40	40.541111	-88.991833
340	KNNK867	800/900	MC LEAN, COUNTY OF	43	40.516694	-88.828972
341	WQOR387	450-470	MCCLURE, STEVEN M	32	41.074333	-88.949417
342	KCW420	25-50, 150-174	MCLEAN COUNTY 911 CENTER	56	40.479194	-88.991750
343	WPIV283	150-174	McLean County 911 Center	40	40.475528	-89.034111
344	WPIV283	150-174	McLean County 911 Center	40	40.516694	-88.828972
345	WPIV287	150-174	McLean County 911 Center	40	40.516694	-88.828972
346	WNBH314	450-470	MCLEAN COUNTY AREA EMS SYSTEM	32	40.504194	-89.005639

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347	WRDH249	150-174	MCLEAN COUNTY UNIT 5 SCHOOL DISTRICT	32	40.582583	-89.137333
348	WRDH249	150-174	MCLEAN COUNTY UNIT 5 SCHOOL DISTRICT	32	40.522722	-89.023167
349	WRDH249	150-174	MCLEAN COUNTY UNIT 5 SCHOOL DISTRICT	40	40.540639	-88.990389
350	WRDH249	150-174	MCLEAN COUNTY UNIT 5 SCHOOL DISTRICT	32	40.533167	-88.914722
351	WRDH249	150-174	MCLEAN COUNTY UNIT 5 SCHOOL DISTRICT	32	40.459750	-88.868000
352	WQXT409	800/900	MCLEAN COUNTY UNIT DISTRICT 5	24	40.533250	-88.914500
353	WRCH744	150-174	MEISS, DAVID	38	40.745972	-88.929250
354	KUR809	150-174	METAMORA COMM CONS GRADE SCHOOL	40	40.792250	-89.355361
355	KNCH461	25-50, 150-174	METAMORA, VILLAGE OF	40	40.790583	-89.361194
356	WRQZ806	450-470	Midwest Fiber Inc	32	40.501222	-89.024667
357	WPJQ496	150-174	MINONK, CITY OF	40	40.903917	-89.034528
358	WNBL422	150-174	MINONK, TOWNSHIP OF	32	40.865861	-88.988139
359	WRMY753	150-174	Moser Holdings, Inc.	40	40.715000	-88.542778
360	WREI892	450-470	MUELLER, JOHN	40	40.650278	-88.439583
361	WNGP923	150-174, 450-470	N9JOZ Enterprises LLC-Series Communications dba Midwest 2-Way Communications	64	40.604194	-89.525361
362	WNGP923	450-470	N9JOZ Enterprises LLC-Series Communications dba Midwest 2-Way Communications	32	40.947250	-89.309250
363	WPIG593	150-174	NAFFZIGER, RONALD	121	40.665306	-89.463694
364	WQUQ687	450-470	NEISLER FARMS	32	40.702500	-88.951389
365	WQTV955	450-470	NEPTUNE TECHNOLOGY GROUP, INC.	32	40.514222	-88.995389
366	WQTV955	450-470	NEPTUNE TECHNOLOGY GROUP, INC.	32	40.544000	-88.989278
367	WQTV955	450-470	NEPTUNE TECHNOLOGY GROUP, INC.	32	40.518000	-88.934306
368	WRDZ591	150-174	NETTLES, HENRY	40	40.601417	-88.394917
369	WQCM665	450-470	NEWTOWN, TOWNSHIP OF	32	41.069472	-88.780639
370	WQVZ521	800/900	NEXGEN COMMUNICATIONS CORP.	113	41.415278	-88.271944

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371	WNPH280	150-174	Noe Farms	80	40.342528	-88.484500
372	KTE293	150-174	Norfolk Southern Railway Company	40	41.098417	-88.811528
373	WNBV939	150-174	Norfolk Southern Railway Company	40	40.518417	-89.047194
374	WNBV939	150-174	Norfolk Southern Railway Company	40	40.518528	-89.047139
375	WNBV939	150-174	Norfolk Southern Railway Company	40	40.518500	-89.047056
376	WNJI332	150-174	Norfolk Southern Railway Company	40	40.628083	-89.416750
377	WPCC418	150-174	Norfolk Southern Railway Company	40	40.478944	-89.007778
378	WQKD709	150-174	NORFOLK SOUTHERN RAILWAY COMPANY	40	40.626944	-89.332500
379	WPIX239	800/900	NORMAL, TOWN OF	32	40.628917	-88.781167
380	WQWZ678	150-174	NORMAL, TOWN OF	32	40.500556	-88.980833
381	WPAH495	800/900	NORTHERN INDIANA PUBLIC SERVICE COMPANY	257	41.116167	-86.163889
382	WQSJ209	450-470	NORTHERN INDIANA PUBLIC SERVICE COMPANY	257	41.116167	-86.163889
383	WPXW241	450-470	NUTRIEN AG SOLUTIONS INC	32	40.738889	-88.511111
384	WQNL853	450-470	OAK STATE PRODUCTS, INC.	32	41.038528	-89.050722
385	WNFH351	150-174	OAKWOOD COMMUNITY UNIT 76	121	40.113639	-87.828083
386	WNNW432	150-174	OBERY FARMS INC	40	40.806139	-89.320639
387	WQLM727	450-470	OBrien Steel Service	16	40.894528	-89.031444
388	WPML765	150-174	ODELL, TOWNSHIP OF	32	40.997528	-88.518667
389	WNQJ460	150-174	OGLESBY, CITY OF	103	41.297250	-89.061194
390	WQYE800	450-470	OHIO SEMITRONICS OF CA, INC	80	40.813056	-89.614167
391	WRYT529	450-470	Ohio Semitronics of California, Inc.	80	40.961472	-88.544861
392	KNJK878	150-174	OLIO, TOWNSHIP OF	32	40.723639	-89.274806
393	WQIS472	450-470	OLSON, DONNA J	32	41.158278	-88.651500
394	WNAF297	150-174	OLTMAN & SONS INC	64	41.146417	-89.349528
395	WQZP371	150-174	Oltman Jr, Edward	32	40.882194	-89.104833

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396	WQYK528	450-470	ONEALL BROTHERS & SCHOLL	32	40.472750	-88.767472
397	WNWC408	150-174	OSF Healthcare System, d/b/a OSF Heart of Mary Medical Center (Urbana)	121	40.117778	-88.227500
398	WQCY417	150-174, 450-470	OSF SAINT ELIZABETH	32	41.100028	-88.833417
399	KNDN546	150-174, 450-470	OSF SAINT JOSEPH MEDICAL CENTER	40	40.486139	-88.953417
400	WREC954	450-470	Otter Creek Wind, LLC	32	41.114000	-88.719083
401	WPKZ525	450-470	PANDUIT CORPORATION	120	41.590028	-88.020056
402	KNNK875	800/900	PDV Spectrum Holding Company, LLC	113	41.301111	-87.826389
403	WPKX425	800/900	PDV Spectrum Holding Company, LLC	113	41.301111	-87.826389
404	WPML271	800/900	PDV Spectrum Holding Company, LLC	113	41.769444	-88.245556
405	WPML271	800/900	PDV Spectrum Holding Company, LLC	113	41.301111	-87.826389
406	WPTG711	800/900	PDV Spectrum Holding Company, LLC	113	41.301111	-87.826389
407	WPTU725	800/900	PDV Spectrum Holding Company, LLC	112	41.496417	-88.298944
408	KSA946	150-174	PEORIA, CITY OF	56	40.687806	-89.594833
409	KZP220	150-174	PEORIA, CITY OF	56	40.748361	-89.619833
410	KSD295	25-50, 150-174, 450-470	PEORIA, COUNTY OF	72	40.777250	-89.757056
411	KSH226	25-50, 150-174, 450-470	PEORIA, COUNTY OF SHERIFFS DEPT	72	40.690583	-89.696500
412	KNIK497	150-174	PERKINS, JAMES	80	40.835722	-88.335833
413	WNRQ347	150-174	PFISTER, MARVIN:PFISTER, STEVE	40	40.778361	-89.262028
414	WREM969	450-470	Pontiac Community Consolidated School Dist #429	32	40.882750	-88.616806
415	WQCJ535	450-470	PONTIAC SCHOOL DISTRICT 90	32	40.992500	-88.598056
416	WNWA393	150-174	PONTIAC, CITY OF	40	40.908917	-88.630333
417	WNCY806	450-470	POPEJOY PLUMBING & HEATING	64	40.735583	-88.515333
418	WQEV221	450-470	PORTILLO'S HOT DOGS LLC	80	40.513556	-88.954056
419	WQEV221	450-470	PORTILLO'S HOT DOGS LLC	80	40.144194	-88.257028

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420	WPHH411	150-174	POWER FARMS INC	65	40.356972	-88.552833
421	WQLF337	150-174	PRAIRIE CENTRAL SCHOOL DISTRICT 8	40	40.745028	-88.507833
422	WRWK381	150-174	PRAIRIE CENTRAL SCHOOL DISTRICT 8	20	40.736111	-88.715556
423	WRWK381	150-174	PRAIRIE CENTRAL SCHOOL DISTRICT 8	40	40.755028	-88.409222
424	WQPS937	450-470	Prairie State Tractor LLC	32	41.032722	-89.227778
425	WQPS937	450-470	Prairie State Tractor LLC	32	40.917222	-88.593056
426	WNQV617	450-470	PRINCETON HIGH SCHOOL DISTRICT 500	64	41.363639	-89.393417
427	WNIW885	450-470	PROBYN, JUSTIN	64	41.017528	-89.476194
428	WQNF752	450-470	PROTECTION ASSOCIATES, INC	80	41.116944	-87.865972
429	WQVW909	450-470	PROTECTION ASSOCIATES, INC.	80	41.116944	-87.865972
430	WNHD772	800/900	RAGAN COMMUNICATIONS INC	113	40.653056	-89.587333
431	WNHD772	800/900	RAGAN COMMUNICATIONS INC	113	40.697806	-89.471750
432	WNIC994	800/900	RAGAN COMMUNICATIONS INC	113	40.834306	-89.616667
433	WQYT860	450-470	RAMP AG.,INC	32	40.531944	-88.615833
434	WNNL226	450-470	RANSOM FERTILIZER SALES INC	56	41.157528	-88.655333
435	WQLD611	800/900	RCP Enterprises, Inc	113	41.540556	-88.035556
436	KRV214	150-174	READING TOWNSHIP VOLUNTEER FIRE DEPT	48	41.105583	-88.832861
437	KBL646	150-174	RIBER CONSTRUCTION INC	40	41.105028	-88.417278
438	KNGV388	450-470	RIDGEVIEW SCHOOL DISTRICT #19	48	40.564194	-88.614222
439	WNSZ338	150-174	RIENTS, JEFF	64	40.924750	-88.866750
440	WPCZ540	450-470	Rivian Automotive, LLC	32	40.512528	-89.055639
441	WQSW615	450-470	RJ & Sons Equipment LLC	32	41.013639	-89.277028
442	KNNK414	150-174	ROANOKE, VILLAGE OF	40	40.790861	-89.195917
443	WPPG947	150-174	ROANOKE, VILLAGE OF	40	40.792806	-89.197861
444	WRQV523	150-174	Roberts, Adam	48	40.799167	-88.775833

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445	KNJE387	150-174	ROBISKY, JOHN	64	40.892250	-88.268111
446	WPNT402	450-470	Ruff Brothers Grain	6	40.741694	-88.877833
447	WQYG812	450-470	RUFF BROTHERS GRAIN	32	41.013333	-89.056667
448	WQCR252	25-50	RUFF, JERRY	40	40.991694	-88.825639
449	KC25309	450-470	SAGA COMMUNICATIONS OF ILLINOIS, LLC	80.5	40.126389	-88.290278
450	KC62825	450-470	SAGA COMMUNICATIONS OF ILLINOIS, LLC	80.5	40.126389	-88.290278
451	WQEP556	150-174	Saint Joseph Medical Center	32	40.480111	-88.957306
452	WRJI718	150-174	Sancken, Brandon E	40	40.871389	-88.489167
453	WQHL595	150-174	SANCKEN, WALTER	32	40.877222	-88.415278
454	WRXB749	450-470	SC2 SERVICES CORPORATION	32	40.503722	-89.037806
455	WRXB749	450-470	SC2 SERVICES CORPORATION	32	40.503611	-89.037778
456	WQWJ613	150-174	SCHAFFER, KEVIN W	40	40.790583	-88.587556
457	WRNQ843	150-174	Schaffer, Matthew	40	40.831389	-88.603056
458	WNDF633	450-470	SCHAUMBURG, BRIAN	72	40.755583	-88.607000
459	WQUP340	150-174	Scherer, David	32	40.804833	-89.161972
460	KNIE705	150-174	SCHERR, ROGER	48	40.661139	-88.512556
461	WQZW206	150-174	Schertz Aerial Service, Inc.	40	40.580750	-88.708528
462	WQWM596	150-174	SCHICK, NATHAN	48	40.643361	-89.403417
463	WQQA326	150-174	SECOR FIRE PROTECTION DISTRICT	32	40.741333	-89.137389
464	WRKU576	450-470	Securitas Technology Corporation	80	40.719056	-89.593417
465	WQPD704	450-470	Siemens Gamesa Renewable Energy, Inc.	32	40.878056	-89.008056
466	WQML239	150-174	SLAGEL, DONALD	40	40.715278	-88.451389
467	WQOH885	450-470	Southwest Airlines Company	32	40.477222	-88.915833
468	KNIK458	150-174	ST. JAMES HOSPITAL	56	40.872778	-88.671944

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469	WNWI441	800/900	STATE FARM MUTUAL AUTOMOBILE INSURANCE COMPANY	48	40.477250	-88.955083
470	WRPV690	450-470	STATE LINE FARMS	121	40.193889	-87.522583
471	WQWM975	150-174	STEPHENS, DOUG	40	40.817639	-88.439750
472	WNDQ702	150-174	STERLING ROCK FALLS READY MIX INC	121	41.787806	-89.761222
473	WNIR674	450-470	Sterrenberg, Casey	56	40.834472	-88.314778
474	WQJM518	450-470	STREATOR TOWNSHIP HIGH SCHOOL	32	41.116944	-88.831111
475	WRKC238	150-174	Streator Woodland Community Unit District 5	32	41.126556	-88.837083
476	WQKT892	450-470	Streator-Cayuga Ridge Wind Power, LLC	32	40.980722	-88.441139
477	WQSU415	450-470	Streator-Cayuga Ridge Wind Power, LLC	32	40.961111	-88.445444
478	WPKQ827	150-174	STROH, LOUIS	40	40.541694	-88.452833
479	WQXX632	150-174	STUBBLEFIELD MR., ANDY	40	40.446028	-88.986194
480	WNFK437	150-174	SULLIVAN, DUANE R	48	40.915306	-89.070361
481	WQLD452	450-470	Sun Ag, Inc.	40	40.761139	-89.030639
482	WPEH988	450-470	SUPREME RADIO COMMUNICATIONS INC	56	41.063083	-89.585639
483	WPEH989	450-470	SUPREME RADIO COMMUNICATIONS INC	56	41.063083	-89.585639
484	WPSM245	450-470	Supreme Radio Communications Inc	32	40.483056	-88.995278
485	WPWT951	450-470	Supreme Radio Communications Inc	32	40.483056	-88.995278
486	WQBX471	450-470	Supreme Radio Communications Inc	32	40.483056	-88.995278
487	WNGS881	800/900	SUPREME RADIO COMMUNICATIONS, INC	113	40.619472	-89.572333
488	WNGS881	800/900	SUPREME RADIO COMMUNICATIONS, INC	113	40.483056	-88.995278
489	WPKY787	450-470	SUPREME RADIO COMMUNICATIONS, INC	52	40.736972	-89.575083
490	WNXX459	450-470	Supreme Radio Communications, Inc.	32	40.483083	-88.995361
491	WNXX459	450-470	Supreme Radio Communications, Inc.	80	40.483056	-88.995278
492	WPRY235	450-470	Supreme Radio Communications, Inc.	32	40.483056	-88.995278

ID	Call Sign	Frequency Band (MHz)	Licensee	Mobile Area Radius (km)	Latitude (NAD83)	Longitude (NAD83)
493	WPSE344	450-470	Supreme Radio Communications, Inc.	32	40.483056	-88.995278
494	WQCH508	150-174	SWARTZ, GARY	80	40.920278	-88.388056
495	WNFC332	450-470	SWEARINGEN, JOHN	64	40.268917	-89.230639
496	WQWZ467	800/900	Tate & Lyle Ingredients Americas LLC	113	39.841139	-88.924528
497	WRKX712	800/900	TCJ ENTERPRISES, INC	88	41.496417	-88.298944
498	WQMI805	150-174	Texas Eastern Communications, LLC	80	40.720194	-89.088889
499	WQMI805	150-174	Texas Eastern Communications, LLC	80	40.162389	-89.042306
500	WQMI805	150-174	Texas Eastern Communications, LLC	80	40.828806	-88.861111
501	WQMI805	150-174	Texas Eastern Communications, LLC	80	41.099694	-88.277306
502	WRJC321	150-174	THORSON, RYAN W	40	40.993333	-88.643889
503	WQTV818	450-470	Toepper, Allen	40	40.999389	-89.082500
504	KZZ424	150-174	Toledo Peoria & Western Railway	80	40.639194	-89.581222
505	WQUC790	150-174	Toledo Peoria & Western Railway Inc	40	40.751111	-88.335556
506	WPVK970	150-174	TOLUCA FIRE PROTECTION AND AMBULANCE DISTRICT	32	41.001417	-89.135639
507	WNXN918	450-470	TOLUCA, CITY OF	24	41.002389	-89.134472
508	WPMS274	150-174	TOWANDA FIRE PROTECTION DISTRICT	40	40.563361	-88.902861
509	KNCS876	25-50	TOWANDA, TOWNSHIP OF	48	40.563361	-88.902861
510	WPGZ665	450-470	TRACY, MATTHEW W	64	41.031417	-89.620361
511	WRJI305	150-174	TRAUB, JOHN C	64	40.736111	-88.516389
512	WQTA209	150-174	TREE LINE GRAIN INC.	40	40.760917	-89.177250
513	KNNT689	450-470	TUCCI INDUSTRIES INC	32	40.451417	-89.007028
514	WNSB463	450-470	TUCCI, BYRON	32	40.451417	-89.007028
515	WQHT325	450-470	U. S. Truck Body	32	41.137667	-88.835056
516	WQWJ306	450-470	UNICOMM ELECTRONICS	121	41.638083	-88.080056
517	KFX965	150-174	UNION PACIFIC RAILROAD COMPANY	40	40.818917	-88.675056

ID	Call Sign	Frequency Band (MHz)	Licensee	Mobile Area Radius (km)	Latitude (NAD83)	Longitude (NAD83)
518	WQER916	150-174	Union Pacific Railroad Company	40	41.064778	-88.463111
519	WQKU424	150-174	Union Pacific Railroad Company	40	40.515111	-88.973722
520	WQKU761	150-174	Union Pacific Railroad Company	40	40.564611	-88.897583
521	WQKU939	150-174	Union Pacific Railroad Company	40	40.873667	-88.640556
522	WQKU939	150-174	Union Pacific Railroad Company	40	41.111111	-88.405278
523	WQKV224	150-174	Union Pacific Railroad Company	40	40.675472	-88.763694
524	WPFN897	450-470	UNITED RADIO	64	40.833361	-89.318972
525	KB82881	216-220	UNIVERSITY OF MEMPHIS	640	36.000056	-86.000000
526	WQBY549	450-470	Vactor Manufacturing, Inc	32	41.100000	-88.824444
527	WPTZ724	150-174	VARNA FIRE DEPARTMENT AMBULANCE SERVICE	32	41.037250	-89.220083
528	WRXM842	150-174	VARNA, CITY OF	40	41.030000	-89.223722
529	KRJ514	150-174	VEATCH AND SONS	121	40.585861	-88.143111
530	WQQJ756	150-174	Vercler, Aaron	40	40.704833	-89.364417
531	WPGW541	450-470	Vermilion Valley Regional ETSB	40	40.992500	-88.598056
532	WPHP729	450-470	Vermilion Valley Regional ETSB	40	40.880861	-88.629778
533	WPHX984	450-470	Vermilion Valley Regional ETSB	40	40.880861	-88.629778
534	WPTQ622	450-470	Vermilion Valley Regional ETSB	32	40.870861	-88.639611
535	WPZS315	150-174	Vermilion Valley Regional ETSB	40	40.992500	-88.598056
536	WREP875	150-174	VILLAGE OF DANA POLICE DEPARTMEN	40	40.957028	-88.949444
537	WPXA381	150-174	Vollmer, Francis G	40	40.967250	-88.728111
538	WQFH265	450-470	VON MAUR	79	40.515278	-88.951111
539	WNSF383	450-470	WALLRICH, GENE	64	40.833361	-88.300611
540	KTR830	150-174	WALTER, PETER D	48	40.706972	-88.411167
541	WQOT887	150-174	WATTERS, ROBERT K	48	41.055583	-88.470889
542	WQXM282	450-470	WENGER FARMS	25	40.714722	-88.467778

ID	Call Sign	Frequency Band (MHz)	Licensee	Mobile Area Radius (km)	Latitude (NAD83)	Longitude (NAD83)
543	WRZI370	150-174	Wenger, Nathan D	40	40.741389	-88.523611
544	WRDM900	450-470	WENONA POLICE DEPARTMENT	30	41.052278	-89.051250
545	WRFH997	150-174	WENONA, CITY OF	40	41.051778	-89.049889
546	WQZT877	800/900	Western Will County Communication Center	113	41.308722	-88.146083
547	WQZT878	800/900	Western Will County Communication Center	113	41.435389	-88.183333
548	WQOC966	450-470	White Oak Energy, LLC	32	40.591250	-89.047417
549	WQQI865	450-470	White Oak Energy, LLC	32	40.586611	-89.072694
550	WQMB294	450-470	WHITE, TODD	32	40.948083	-89.309806
551	WQUU895	450-470	White, Todd	32	40.948083	-89.309806
552	WQUU895	450-470	White, Todd	40	40.946028	-89.270139
553	WNZW872	450-470	WIELAND BROS	64	40.619472	-89.572333
554	WPSH670	450-470	Willet Hofmann & Assoc Inc	161	41.850000	-89.475000
555	WRKA855	450-470	Wireless Data Net, LLC	32	40.477222	-88.553889
556	WPEH585	800/900	Wireless US LC	113	40.180861	-88.317833
557	KD50657	150-174	WISCONSIN POWER AND LIGHT COMPANY	241	43.005000	-89.196222
558	KJM544	450-470	WLS TELEVISION, INC.	160	41.878917	-87.636167
559	WQAH288	150-174	WOODFORD COUNTY EMERGENCY TELEPHONE SYSTEM BOARD	40	40.723083	-89.272028
560	KCN993	25-50, 150-174, 450-470	WOODFORD, COUNTY OF	32	40.723083	-89.272028
561	KSM967	25-50, 150-174	WOODFORD, COUNTY OF	40	40.790417	-89.195917
562	KTE360	150-174	WOODFORD, COUNTY OF	48	40.723083	-89.270639
563	WRDF445	800/900	WOODFORD, COUNTY OF	64	40.823889	-89.311389
564	WRDF445	800/900	WOODFORD, COUNTY OF	64	40.900944	-89.039444
565	KRB707	150-174	WORTH ROAD DISTRICT	40	40.777528	-89.415917
566	WQVQ393	450-470	WYSS FARMS INC.	32	40.675722	-89.336472

ID	Call Sign	Frequency Band (MHz)	Licensee	Mobile Area Radius (km)	Latitude (NAD83)	Longitude (NAD83)
567	WQMP631	150-174	YATES ROAD & BRIDGE	15	40.755556	-88.691667
568	WNGC296	800/900	Young, Joseph	113	40.716667	-88.001111
569	WNGC296	800/900	Young, Joseph	113	40.923250	-87.825889
570	WNGC296	800/900	Young, Joseph	113	40.753333	-87.747778
571	WPEY408	800/900	Young, Joseph	113	40.181111	-88.317500
572	WQOT723	150-174	YOUNG, RICHARD L	40	40.502778	-88.505556
573	WPMT254	450-470	YOUNGS SECURITY SYSTEMS	120	39.827278	-89.595389
574	WNDQ640	150-174	ZIMMERMAN, HOWARD	32	40.802806	-88.701444
575	WNXE971	150-174	ZOSS, JAMES A	32	40.852806	-89.283139
576	WNYV635	150-174	ZOSS, STANLEY	32	40.851139	-89.260639

Table A: Mobile Licenses Intersecting Project Area

Wind Power GeoPlanner™

Mobile Phone Carrier Report

Panther Grove 2

Prepared on Behalf of
Panther Grove 2, LLC

January 12, 2024

COMSEARCH®
A CommScope Company

Table of Contents

1. Introduction

Comsearch has developed and maintains comprehensive technical databases containing information on licensed mobile phone carriers across the US. Mobile phone carriers operate in multiple frequency bands and are often referred to as Advanced Wireless Service (AWS), Personal Communication Service (PCS), 700 MHz Band, Wireless Communications Service (WCS), and Cellular. They hold licenses on an area-wide basis which are typically comprised of several counties.

This report focuses on the potential impact of wind turbines on mobile phone operations in and around the project area.

2. Summary of Results

Methodology

Our mobile phone analysis was performed using Comsearch's proprietary carrier database, which is derived from a variety of sources including the Federal Communications Commission (FCC). Since mobile phone market boundaries differ from service to service, we disaggregated the carriers' licensed areas down to the county level. Then we compiled a list of all mobile phone carriers in the main counties that intersect the area of interest. The area of interest was defined by the client and encompasses the planned turbine locations. A depiction of the wind project area and counties appears below.

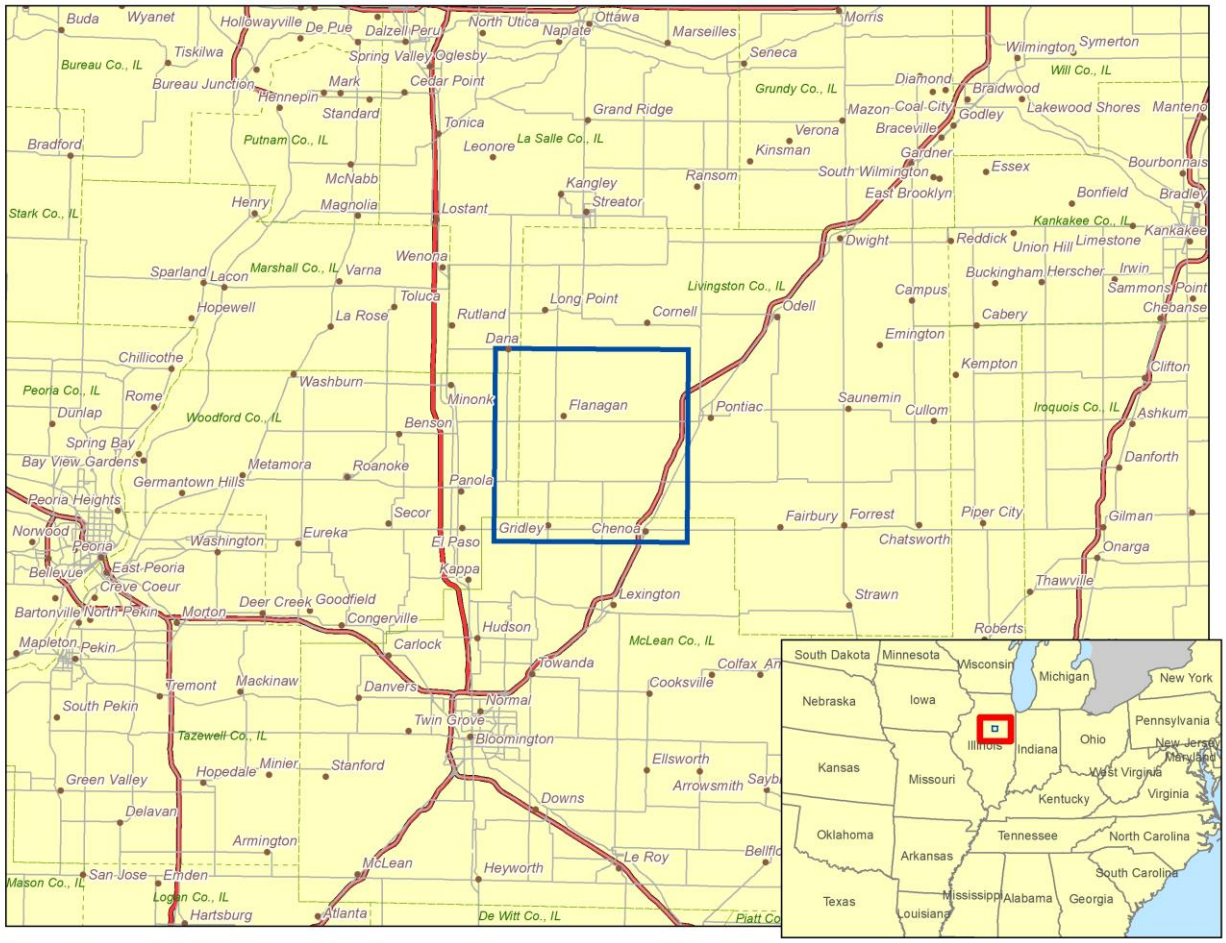

Figure 1: Counties that intersect the Area of Interest

Results
The Panther Grove project is located in Livingston County, Illinois. We have identified the type of service, channel block, market ID and FCC callsign for each carrier in the county of interest. A description of the various service types and geographic market areas is below with a summary table on the following page.

AWS
AWS licensees won their spectrum in an auction that started in August 2006. The licensees are authorized by 734 Cellular Market Areas (CMA) for Block A, 176 Economic Areas (BEA) for Blocks B and C, and 12 Regional Economic Area Groupings (REAG) for Blocks D, E and F. This spectrum at 1.7 and 2.1 GHz was allocated for mobile broadband and advanced wireless services. Partitioning and leases are permitted in the band.

Cellular
Licensees are authorized by Metropolitan and Rural Statistical Areas, also known as CMAs. Unserved areas can be covered by licensees other than the original A or B block licensee. To determine the most realistic coverage, we compiled the Cellular Geographic Service Areas (CGSA) from the 32 dBu contours defined by Part 22.911(a) of the FCC rules. Mobile services are provided at 800 MHz and partitioning and leases are permitted in the band.

PCS
There have been nine auctions for this band, with the last one being held in August 2008. Licensees are authorized by 51 Major Trading Areas (MTA) for Blocks A and B, 493 Basic Trading Areas (BTA) for Blocks C through F, and 176 Economic Areas (EA) for Block G. This band has been heavily partitioned and disaggregated both by counties and by smaller polygons within counties (known as undefined areas or partial counties). The 1.9 GHz PCS carriers provide mobile services and leases are permitted in the band.

700 MHz Band
Originally used for analog television broadcasting, this band consists of an upper and lower band, each having its own set of frequency blocks. There have been three auctions in this band with the last one (Auction 73) being held in 2008 and mobile phone carriers eventually winning licenses for Blocks A, B, and C of the Lower 700 MHz band and Block C of the Upper 700 MHz band. Licensees are authorized by 176 Economic Areas (EA) for Lower Block A, 734 Cellular Market Areas (CMA) for Lower Blocks B and C, and 12 Regional Economic Area Groupings (REAG) for Upper Block C. Partitioning and leases are permitted in the band.

WCS
Mobile services provided in the 2.3 GHz band occupy frequency blocks above and below the spectrum allocated for Satellite Digital Audio Radio Service (SDARS) from 2320 MHz to 2345 MHz. WCS licensees are authorized by 52 Major Economic Areas (MEA) for Blocks A and B and 12 Regional Economic Area Groupings (REAG) for Blocks C and D. Partitioning and leases are permitted in the band.

Service[1]	Mobile Phone Carrier	Channel Block	County	ST	Market ID	Callsign
700 MHz	T-Mobile	Lower A	Livingston	IL	BEA064	WQJQ707
700 MHz	US Cellular	Lower B	Livingston	IL	CMA395	WQLE725
700 MHz	AT&T	Lower C	Livingston	IL	CMA395	WPYZ902
700 MHz	AT&T	Lower D	Livingston	IL	EAG704	WPZA238
700 MHz	DISH Network	Lower E	Livingston	IL	BEA064	WQJZ206
700 MHz	Verizon	Upper C	Livingston	IL	REA003	WQJQ691
AWS	Verizon	A	Livingston	IL	CMA395	WQGB347
AWS	Verizon	B	Livingston	IL	BEA064	WQGA952
AWS	AT&T	C	Livingston	IL	BEA064	WQGA776
AWS	AT&T	D	Livingston	IL	REA003	WQGV784
AWS	T-Mobile	E	Livingston	IL	REA003	WQGB376
AWS	T-Mobile	F	Livingston	IL	REA003	WQPZ970
Cellular	AT&T	A	Livingston	IL	CMA395	KNKN328
Cellular	Cellular One	B	Livingston	IL	CMA395	KNKN583
Cellular	Cellular One	B	Livingston	IL	CMA395	KNKN581
Cellular	Cellular One	B	Livingston	IL	CMA395	KNKN582
PCS	AT&T	A	Livingston	IL	MTA003	KNLF206
PCS	AT&T	A	Livingston	IL	MTA003	WPSF246
PCS	Verizon	B	Livingston	IL	MTA003	KNLF207
PCS	T-Mobile	B	Livingston	IL	MTA003	WQRJ905
PCS	T-Mobile	C	Livingston	IL	BTA046	WPOK680
PCS	T-Mobile	C	Livingston	IL	BTA046	WQND997
PCS	T-Mobile	D	Livingston	IL	BTA046	KNLH478
PCS	Verizon	E	Livingston	IL	BTA046	KNLF927
PCS	T-Mobile	F	Livingston	IL	BTA046	KNLF892
PCS	T-Mobile	G	Livingston	IL	BEA064	WQKT278
WCS	AT&T	A	Livingston	IL	MEA018	KNLB305

[1] AWS: Advanced Wireless Service at 1.7/2.1 GHz
CELL: Cellular Service at 800 MHz
PCS: Personal Communication Service at 1.9 GHz
700 MHz: Commercial Mobile Phone at 700 MHz
WCS: Wireless Communication Service at 2.3 GHz

Service[1]	Mobile Phone Carrier	Channel Block	County	ST	Market ID	Callsign
WCS	AT&T	B	Livingston	IL	MEA018	KNLB279
WCS	AT&T	C	Livingston	IL	REA003	WPQL712
WCS	AT&T	D	Livingston	IL	REA003	KNLB325

Table 1: Mobile Phone Carriers in the Area of Interest

FCC-Licensed Sites

For competitive and confidentiality reasons, most mobile phone carriers' individual sites are not licensed with the FCC. However, in the cellular band, if a base station extends the existing Cellular Geographic Service Area (CGSA), then it must be recorded with the FCC. We identified two cellular sites within the Panther Grove area of interest. Figure 2 on the next page depicts their locations in relation to the area of interest and Table 2 contains the technical parameters on the FCC license.

Callsign	Licensee	Antenna Height (m)	ASR Number	Latitude (NAD83)	Longitude (NAD83))
KNKA792	AT&T	unknown	1230146	40.727111	-88.731639
KNKN328	AT&T	58	none	40.871222	-88.810639

Table 2: FCC-Licensed Mobile Phone Sites

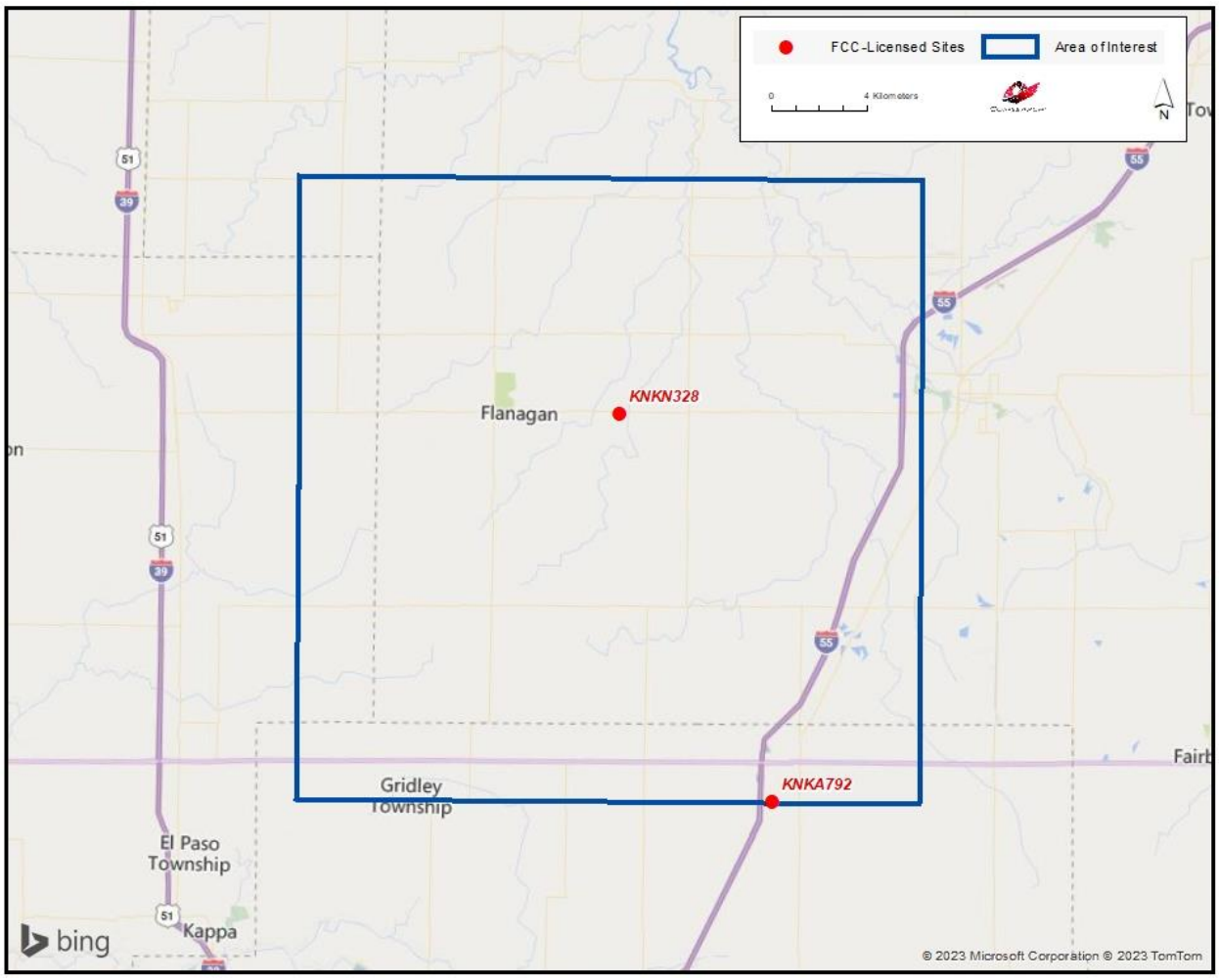

Figure 2: FCC-Licensed Mobile Phone Sites within the Area of Interest

Impact Assessment and Distance Setback Requirements

The cellular mobile phone signal propagation is typically not affected by physical structures because the beam widths of the radiated signal from the base stations and mobile units are very wide and the wavelength of the signal is long enough to wrap around objects such as wind turbine towers and blades. In addition, the cellular network consists of multiple base stations that are designed so that if the connection cannot be made to one base station it will shift to adjacent base stations to make the connection. This enables cellular mobile telephone systems to provide coverage in areas that are congested with physical structures such as downtown urban areas. Areas containing wind turbines have less of a coverage issue than urban areas, so the wind turbines presence does not require any special setback for signal obstruction consideration other than physical clearance of the blades. From an electromagnetic interference standpoint, the emissions from the wind turbines, which are specified by the FCC, should be taken into account to ensure they will not interfere with the base stations or the mobile units. Part 15 of the FCC regulations covers the emissions from unintentional radiating devices, such as wind turbines. The field strength limits for the emissions from unintentional radiators is given in paragraph 15.109 of Part 15 of the FCC rules. The emission limits are stated for a distance of 3 meters or approximately 10 feet and are shown below.

Radiated Emission Limits at 3 Meters

Frequency of Emission (MHz)	Field Strength (microVolts/meter)
30 – 88	100
88 – 216	150
216 – 960	200
> 960	500

From these limits and the receiver sensitivity of the cellular base stations and mobile units we can determine a setback requirement for wind turbines and cellular system. The typical sensitivity of mobile units is -90 dBm ($1X10^{-12}$ Watts) and the typical sensitivity of base stations is -93 dBm ($5X10^{-13}$ Watts). The gain of mobile unit antennas are -10dB or 0.1 and the gain of base station antennas are 17 dB or 50. The effective area (A) of the mobile unit and base station antennas are determined from the following formula.

$$A = G*\lambda^2 / 4*\pi$$

Where,
G = Antenna Gain, number
λ = Wavelength, 0.353 meters
π = 3.14

This gives us an effective area for the mobile unit antenna of $9.9X10^{-4}$ meter^2 and the effective area for the base station antenna of 0.496 meter^2. Using the typical receiver sensitivities of the mobile and base units above, we can determine their power flux density (P_D) from the following formula:

$$P_D = S/A$$

Where S is defined as the sensitivity for Mobile Unit or for the Base Station expressed in Watts

To calculate the electric field strength (E) we use the following formula:

$$E = (P_D * 377)^{½}$$

So for the mobile unit, $P_D = 1.01X10^{-9}$ Watts/meter^2 and E = 617 microVolts/meter. And, for the base station unit, $P_D = 1.008X10^{-12}$ Watts/meter^2 and E= 19.4 microVolts/meter.

These results show that the mobile units' sensitivity expressed as field strength is above the level allowed as an emission for the wind turbines at a distance of 3 meters. Therefore, no setback for the use of a mobile unit is needed beyond 3 meters. Since the base station has field strength sensitivity below the allowed emission level of the wind turbines a setback distance is needed to ensure that the base stations will not be affected. The field strength of the emission is inversely proportional to separation distance in meters. To determine the setback distance to reduce the field strength to 19.4 microVolts/meter the following formula is used.

D = (500 MicroVolts/meter)*(3 meters) / 19.4 MicroVolts/meter

Where,
D = Setback Distance for Base Station to avoid interference, meters

Thus the setback distance for the cellular tower base station from the wind turbines should be 77.3 meters or greater.

Summary

The telephone communications in the mobile phone carrier bands are typically unaffected by the presence of the wind turbines and we do not anticipate any significant harmful effect to mobile phone services in Panther Grove 2 project area. Mobile phone systems are designed with multiple base transmitter stations covering a specific area. Since mobile telephone signals are designed with overlap between adjacent base transmitter sites in order to provide handoff between cells, any signal blockage caused by the wind turbines does not materially degrade the reception because the end user may be receiving from multiple transmitter locations. For example, if a particular turbine attenuates the signal reception into a mobile phone, the phone may receive an alternate signal from a different transmit location, resulting in no disruption in service. Mobile phone systems that are implemented in urban areas near large structures and buildings often have to combat even more problematic signal attenuation and reflection conditions than rural areas containing a wind energy turbine facility.

For the cellular towers located within the project area, no setback distance is required from an interference standpoint other than physical clearance of the blades. From an electromagnetic

standpoint, a setback distance of 77.3 meters should be used to meet FCC emission requirements.

In the unlikely event that a mobile phone carrier believes their coverage has been compromised by the presence of the wind energy facility, they have many options to improve their signal coverage to the area through optimization of a nearby base transmitter or even adding a new sector or cell site. Utility towers, meteorological towers or even the turbine towers within the wind project area can serve as the platform for a base transmit site or cell enhancer.

3. Contact Us

For questions or information regarding the Mobile Phone Carrier Report, please contact:

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Company:	Comsearch
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Email:	David.Meyer@CommScope.com
Web site:	www.comsearch.com

Wind Power GeoPlanner™

Communication Tower Study

Panther Grove 2

Prepared on Behalf of
Panther Grove 2 LLC

January 15, 2023

COMSEARCH®
A CommScope Company

Table of Contents

1. Introduction

This Communication Tower Study was performed for the Panther Grove 2 project in Livingston County, Illinois to identify the tower structures as well as FCC-licensed communication antennas that exist in the project area of interest. This information is useful in the planning stages of the wind energy facilities to identify turbine setbacks and to prevent disruption to the services provided by the tenants on the towers. This data can be used in support of the wind energy facilities communications needs in addition to avoiding any potential impact to the current communications services provided in the region.

2. Summary of Results

The communication towers and antennas in the study area were derived from a variety of sources including the FCC's Antenna Structure Registration (ASR) database, Universal Licensing System (ULS), national and regional tower owner databases, and the local planning and zoning boards. The data[1] was imported into GIS software and the structures mapped in the wind energy area of interest. Each tower location is identified with a unique ID number associated with detailed structure and contact information provided in a spreadsheet attachment.

Thirteen tower structures and fifty-six communication antennas were identified within the Panther Grove 2 project area of interest using the data sources described in our methodology above. Ten of the structures found were registered with the FCC. The towers identified contain eleven of the fifty-six communication antennas. The remaining antennas may be located on a variety of structure types such as guyed towers, monopoles, silos, rooftops or portable structures. The specific type of structure would normally need to be determined by an on-site visit.

Detailed information about the tower structures and communication antennas is provided in Table 1 and Table 2 including location coordinates, structure height above ground level, and owner-operator name[2].

A discussion of turbine setback distances is provided in section three.

[1] 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.

[2] Please note that this report analyzes all known operators on the towers from data sources available to Comsearch. Unidentified operators may exist on the towers due to unlicensed or federal government systems, mobile phone operators with proprietary locations, erroneous data on the FCC license, and other factors beyond our control.

Tower ID	ASR Number	Owner	Structure Height AGL (m)	Latitude (NAD83)	Longitude (NAD83)
Tower001	1230146	Pinnacle Towers Acquisition LLC	76.2	40.72711111	-88.73163889
Tower002	N/A	American Tower	53.0	40.74015000	-88.86827000
Tower003	N/A	American Tower	56.4	40.74151000	-88.74489000
Tower004	1009717	FBA Corporation	125.9	40.75155556	-88.83613889
Tower005	1009856	Cellco Partnership	91.4	40.76472222	-88.88083333
Tower006	1219889	American Towers LLC	76.5	40.80255556	-88.68375000
Tower007	N/A	American Tower	56.7	40.81519000	-88.69930000
Tower008	1257490	Cellco Partnership	76.2	40.86941667	-88.87863889
Tower009	N/A	American Tower	51.8	40.87125000	-88.81062000
Tower010	1280273	VB-S1 Assets, LLC	76.2	40.87161111	-88.84908333
Tower011	1005592	American Towers LLC	128.3	40.88422222	-88.74244444
Tower012	1060642	American Towers LLC	57.9	40.89522222	-88.67336111
Tower013	1250408	Cellco Partnership	47.2	40.89877778	-88.67452778

Table 1: Summary of Tower Structures

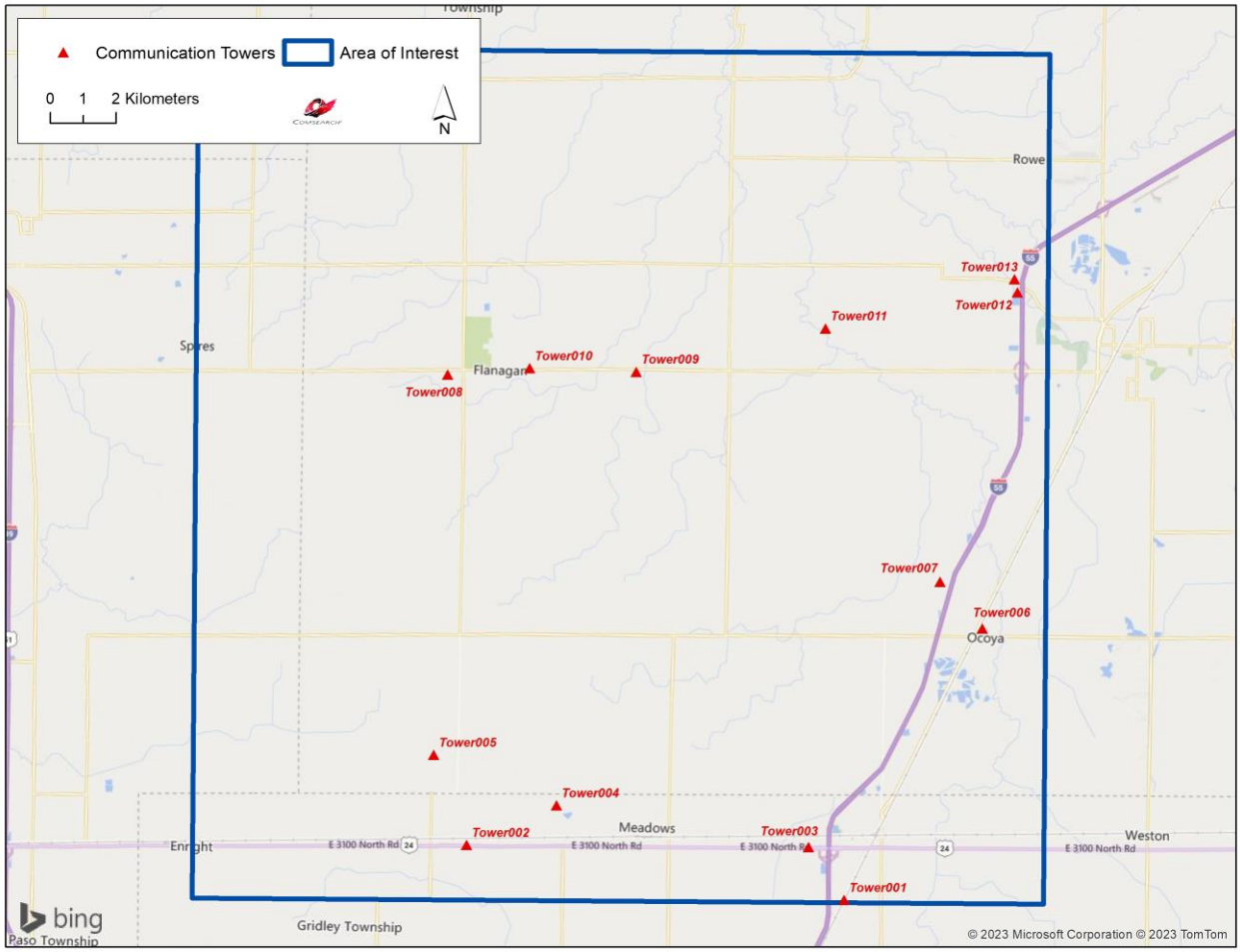

Figure 1: Towers within the Area of Interest

ID	Tower ID	Callsign	Service Type	Licensee	Antenna Height AGL (m)	Latitude (NAD83)	Longitude (NAD83)
1	Tower001	KNKA792	Cellular	AT&T Mobility Spectrum, LLC	Unknown	40.72711111	-88.73163889
2		WQPY262	Land Mobile	BRANDT CONSOLIDATED,INC.	44.0	40.73419444	-88.87505556
3		WPCR931	Land Mobile	GRIDLEY, VILLAGE OF	46.3	40.73419444	-88.87194444
4		WNPY659	Land Mobile	Haney, Daryl	53.0	40.73419444	-88.78922222
5		WPCR931	Land Mobile	GRIDLEY, VILLAGE OF	9.0	40.73558333	-88.87255556
6		WRWK381	Land Mobile	PRAIRIE CENTRAL SCHOOL DISTRICT 8	14.0	40.73611111	-88.71555556
7		KSU993	Land Mobile	Haney, Daryl	40.0	40.73947222	-88.71616667
8		WRJP294	Microwave	Maxwire Inc.	6.1	40.74105556	-88.72266667
9		KSI382	Land Mobile	CHENOA COMMUNITY FIRE PROTECTION DISTRICT	23.0	40.74111111	-88.71000000
10		KZV881	Land Mobile	CHENOA, CITY OF	12.0	40.74111111	-88.71000000
11		WQSD381	Land Mobile	EL PASO-GRIDLEY CUSD #11	36.6	40.74138889	-88.87238889
12		WQUX442	Land Mobile	GRIDLEY FIRE PROTECTION DISTRICT	15.2	40.74188889	-88.88241667
13		WPQE263	Land Mobile	JACOBS, DONALD D	10.0	40.74197222	-88.70227778
14		WQDN329	Land Mobile	GRIDLEY FIRE PROTECTION DISTRICT	4.0	40.74222222	-88.88138889
15		WRBK835	Microwave	Maxwire Inc.	27.43	40.74277778	-88.72191667
16		KUI731	Land Mobile	CHENOA, CITY OF	24.0	40.74308333	-88.71533333
17		KNHG723	Land Mobile	CHENOA, CITY OF	24.0	40.74308333	-88.71533333
18		KUI731	Land Mobile	CHENOA, CITY OF	8.0	40.74336111	-88.71477778
19		WNQU290	Land Mobile	GRIDLEY, TOWNSHIP OF	18.0	40.74447222	-88.88200000
20		WRJP295	Microwave	Maxwire Inc.	25.91	40.74688889	-88.77733333
21		WNSK285	Land Mobile	KRUG, HAROLD	22.0	40.75002778	-88.90036111
22	Tower004	WPKT450	Land Mobile	A BEEP, LLC	125.0	40.75333333	-88.83250000
23		KSU993	Land Mobile	Haney, Daryl	27.0	40.75558333	-88.69172222

ID	Tower ID	Callsign	Service Type	Licensee	Antenna Height AGL (m)	Latitude (NAD83)	Longitude (NAD83)
24		WNPY659	Land Mobile	Haney, Daryl	6.0	40.75558333	-88.69172222
25	Tower005	WQQZ401	Microwave	Cellco Partnership -IA/IL/IN/WI	12.19	40.76472222	-88.88083333
26	Tower006	WRUI568	Microwave	T-Mobile License LLC	71.628	40.80255556	-88.68375000
27	Tower006	IL-CHENO	Microwave	AMG Technology Investment Group LLC	66.142	40.80255556	-88.68375000
28		WNDQ640	Land Mobile	ZIMMERMAN, HOWARD	16.0	40.80280556	-88.70144444
29		WRJT453	Microwave	Maxwire Inc.	32/33.5	40.80569444	-88.68286111
30		KFX965	Land Mobile	UNION PACIFIC RAILROAD COMPANY	33.5	40.81891667	-88.67505556
31		WPMJ444	Land Mobile	UNION PACIFIC RAILROAD COMPANY	4.0	40.81927778	-88.67458333
32		WQKU939	Land Mobile	Union Pacific Railroad Company	3.0	40.82327778	-88.67188889
33		WQUU959	Land Mobile	HAAS, JEREMY	14.0	40.85000000	-88.66388889
34	Tower008	IL-FLANA	Microwave	AMG Technology Investment Group LLC	66.142	40.86941667	-88.87863889
35		WQHG537	Land Mobile	St. James John W. Albrecht Medical Center	18.1	40.87077778	-88.67888889
36	Tower009	KNKN328	Cellular	AT&T Mobility Spectrum, LLC	58.2	40.87122222	-88.81063889
37	Tower009	IL-FLANA	Microwave	AMG Technology Investment Group LLC	52.73	40.87125000	-88.81061111
38	Tower010	WRUI564	Microwave	T-Mobile License LLC	76.2	40.87161111	-88.84908333
39		KNIK458	Land Mobile	ST. JAMES HOSPITAL	36.6	40.87277778	-88.67194444
40		KTS203	Paging	AMS Spectrum Holdings, LLC	85.3	40.87583333	-88.75444444
41		WQQB202	Land Mobile	Martin Sullivan Inc.	47.0	40.87627778	-88.96025000
42		WNQR977	Land Mobile	FLANAGAN FERTILIZER COMPANY INC	15.0	40.87780556	-88.86119444
43		KNCC258	Land Mobile	FLANAGAN GRAYMONT AMBULANCE SERV	18.0	40.87819444	-88.85252778
44		ROOKS CR	Microwave	Pontiac Township High School	42.7	40.87916667	-88.77258333
45	Tower011	WPRG706	Land Mobile	Illinois Cooperative dba Clear Talk	133.5	40.88422222	-88.74244444
46		WPEM984	Land Mobile	Bressner, Roger	11.0	40.88613889	-88.67283333
47		WNUG260	Land Mobile	HARMS, JAMES E	18.0	40.89475000	-88.88063889
48	Tower012	CH89103A	Microwave	T-Mobile License LLC	52.73	40.89522222	-88.67336111

ID	Tower ID	Callsign	Service Type	Licensee	Antenna Height AGL (m)	Latitude (NAD83)	Longitude (NAD83)
49		WNLP353	Land Mobile	KOELLER, JAN	21.0	40.89863889	-88.87230556
50		WQTF323	Land Mobile	DUFFY, STEVE	18.0	40.90247222	-88.71683333
51		WQQV800	Land Mobile	LIVINGSTON LANDFILL DIVISION OF REPUBLIC SERVICES	10.6	40.92225000	-88.66672222
52		WNSZ338	Land Mobile	RIENTS, JEFF	20.0	40.92475000	-88.86675000
53		WRVB270	Land Mobile	Erschen, Frank	13.0	40.95166667	-88.73527778
54		WQFH642	Land Mobile	DANA FIRE PROTECTION DISTRICT	13.3/15.0	40.95700000	-88.94952778
55		WQJF824	Land Mobile	Illinois American Water Company	30.0	40.95708333	-88.94947222
56		WROX918	Microwave	AMG Technology Investment Group LLC	30.48	40.95713889	-88.94933333

Table 2: Summary of Communication Antennas

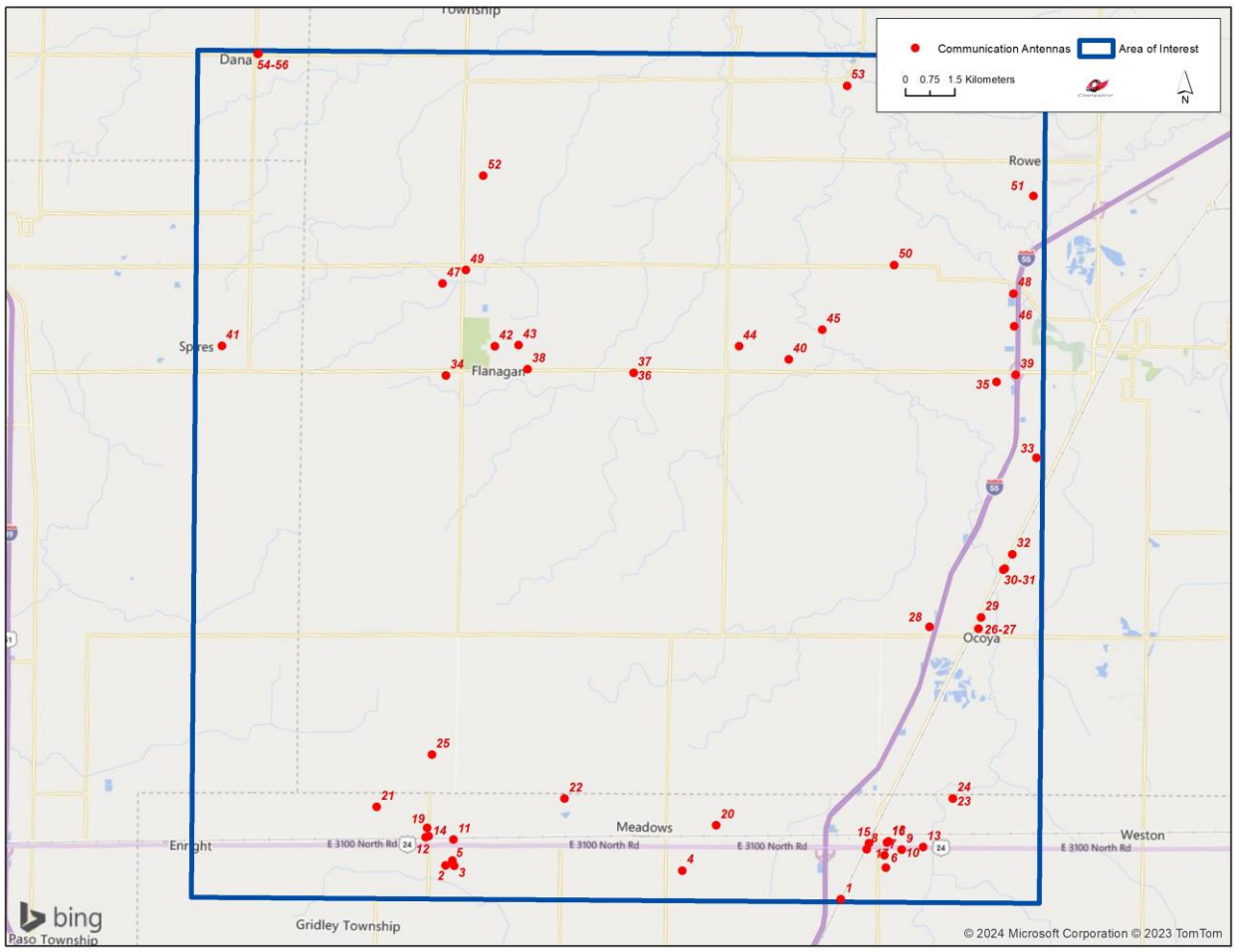

Figure 2: Communication Antennas within the Area of Interest

3. Discussion of Separation Distances

In planning the wind energy turbine locations, a conservative approach would dictate not locating any turbines in close proximity to existing tower structures to avoid any possible impact to the communications services provided by the structures. Reasonable distance between communication towers and wind turbine towers is a function of two things: (1) the physical turning radius of the wind turbine blades and (2) the characteristics of the communication systems on the communication tower.

Since wind turbine blades can rotate 360º in both the vertical and horizontal planes, the first consideration of separation distance to other structures is clearance of the rotating blades. If the blade radius is 50 meters, then a separation distance greater than 50 meters is necessary. From a practical standpoint, a setback distance greater than the maximum height of the turbine is necessary to ensure a “fall” safety zone in the unlikely event of a turbine tower failure. Setback requirements for “fall” safety are typically specified by the local zoning ordinances.

The separation distance required based on the characteristics of the communication systems will vary depending on the type(s) of communication antennas located on the tower. For example, AM, FM and TV communication antennas should be separated by distances that allow for normal coverage. For RADAR and microwave systems, line-of-sight (LOS) is used as the criteria for separation distance as well as the physical clearance necessary for the turbine blades. For land mobile, mobile phone, and wireless Internet systems, setback distances are based on FCC interference emissions from electrical devices according to their respective frequency bands.

4. Conclusions

Our study identified 13 tower structures and 56 communication antennas within the project area. They are used for microwave, cellular, land mobile, and paging services in the area.

5. Contact Us

For questions or information regarding the Communication Tower Study, please contact:

Contact person:	David Meyer
Title:	Senior Manager
Company:	Comsearch
Address:	21515 Ridgetop Circle, Suite 300, Sterling, VA 20166
Telephone:	703-726-5656
Fax:	703-726-5595
Email:	David.Meyer@CommScope.com
Web site:	www.comsearch.com

Wind Power GeoPlanner™

GPS Study

Panther Grove 2

Prepared on Behalf of
Panther Grove 2 LLC

September 17, 2024

COMSEARCH®
A CommScope Company

Table of Contents

1. Introduction

This report examines whether or not the proposed Panther Grove Wind Project would cause signal blockage of GPS antennas which are used as part of a network of continuously operating reference stations (CORS). These stations are registered with the NOAA CORS database and are used to measure GPS carrier phase and code range information to mitigate the effects of the atmosphere, multipath, and timing errors on satellite signals. These measurements are used to generate correction files which are then stored and used to post-process GPS data collected by various users including government, academic and private organizations to improve data accuracy. The correction files are available free of charge and can be found at the following website link: www.ngs.noaa.gov/CORS from a few days to several months after the GPS data was collected.

Likewise, this report examines the impact on the FAA's Wide-Area Augmentation System (WAAS) which was developed primarily to assist aerial navigation but could also be used for agricultural, surveying, recreational and other applications. WAAS antennas are located throughout North America which collect signals from GPS satellites to correct position, velocity, or timing errors and improve data accuracy. Unlike the CORS methodology for correcting GPS data, the WAAS network provides GPS error correction in real time. If real-time correction is not needed, however, CORS offers greater accuracy. Each WAAS station sends data to one of three WAAS Master Stations (WMS) via a terrestrial communications link and transmits messages to one of three WAAS geosynchronous (GEO) satellites using any one of six ground uplink stations (GUS). GPS users could then access the correction data via downlink from one of the GEO satellites.

2. Project Area

The location of the Panther Grove 2 Wind Project in Livingston County, Illinois is shown in Figure 1.

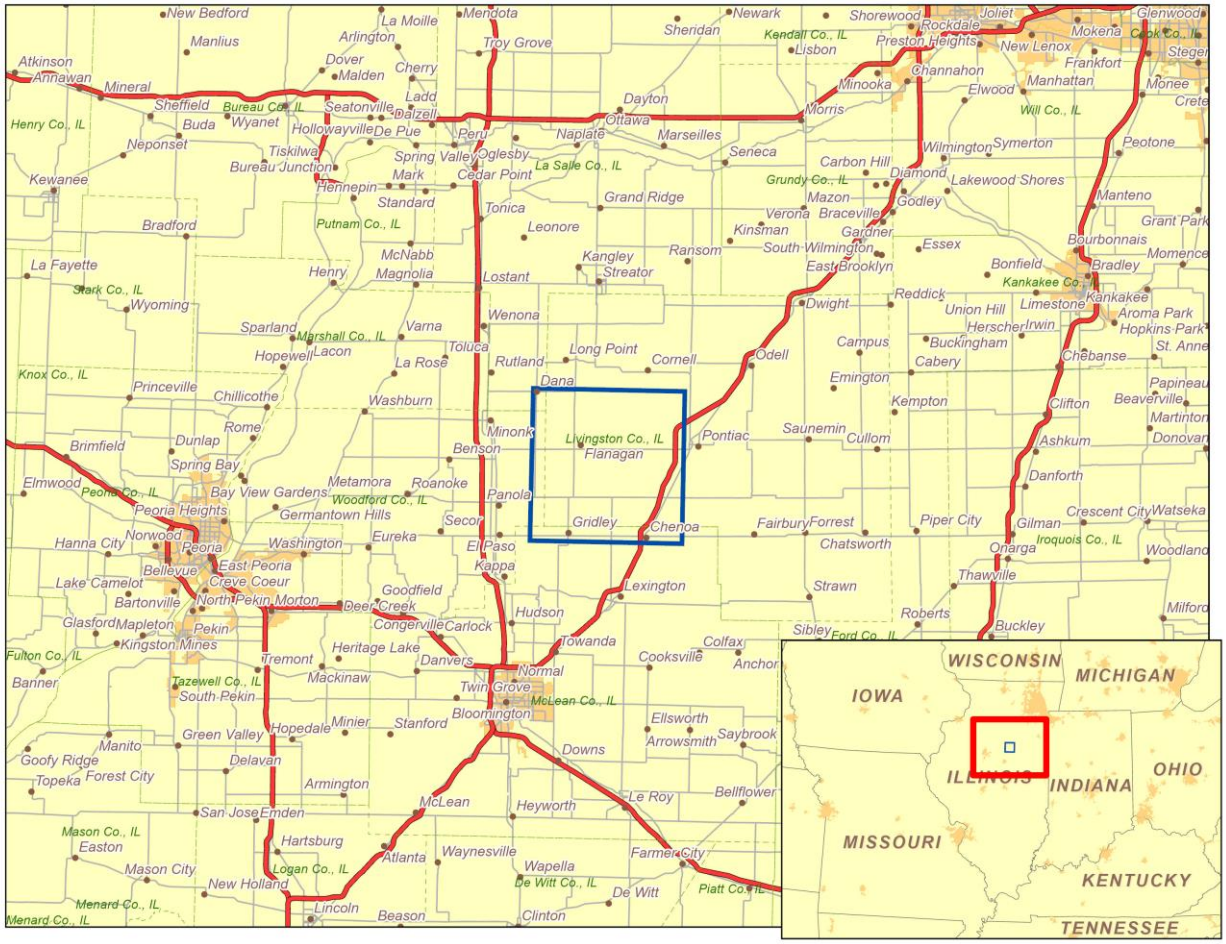

Figure 1: Location of the Panther Grove 2 Wind Project in Illinois

3. Impact Assessment

The locations of the project area of interest (AOI) with respect to the three nearest CORS antenna locations are shown in Figure 2. The callsigns of the three antennas and corresponding distances from the area of interest are listed in table 1.

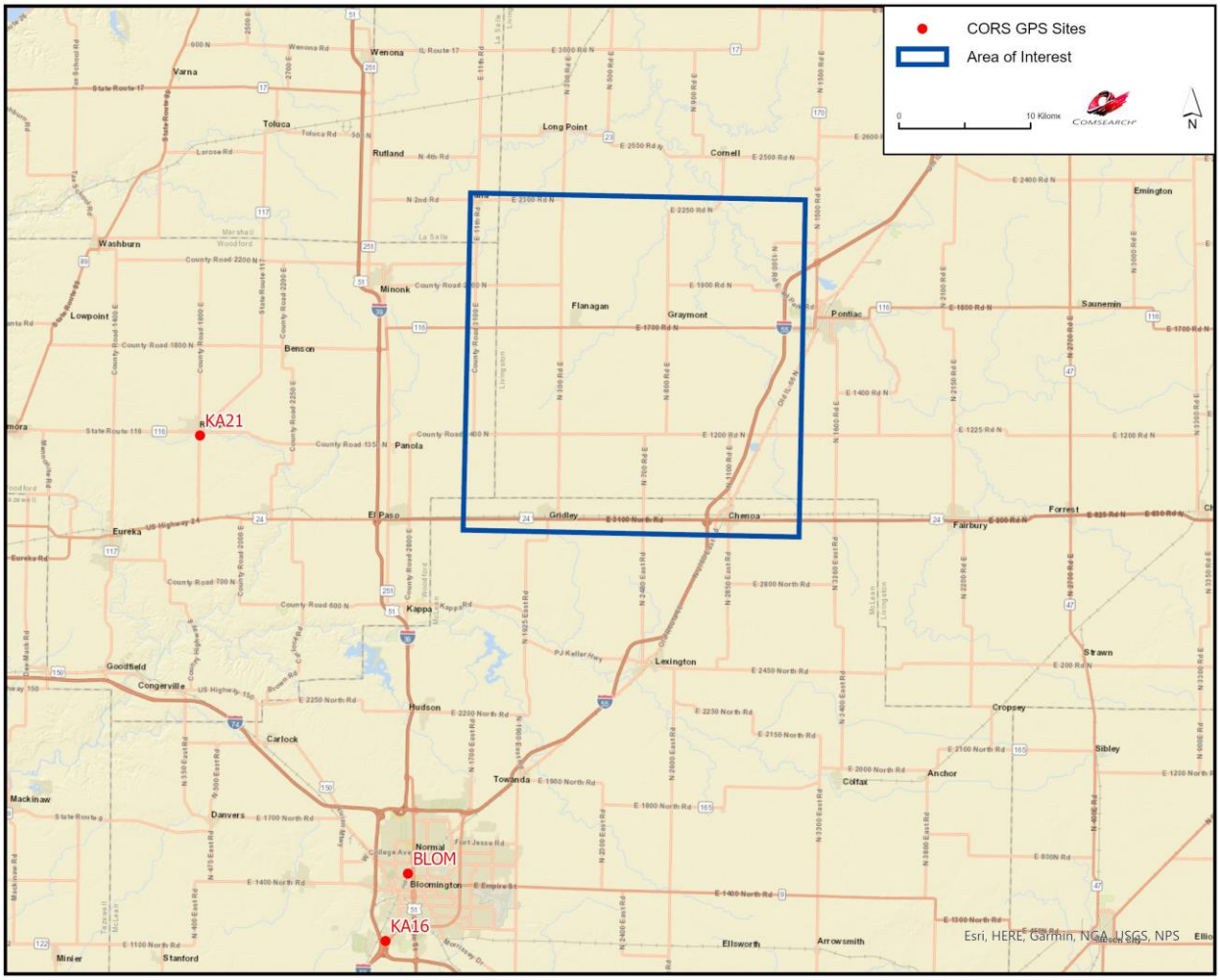

Figure 2: Nearest CORS Antennas and Panther Grove 2 Wind Project Area

Name	Latitude (NAD83)	Longitude (NAD83)	Distance to the Nearest Turbine (km)
KA21	40.791389	-89.195833	22.67
BLOM	40.495556	-88.999722	29.51
KA16	40.449167	-89.018333	34.88

Table 1: Nearest CORS Antennas and Distances from Area of Interest

The closest WAAS antenna is registered under callsign KZAU and is 109 km from the Area of Interest in Aurora, Illinois.

To determine the potential impact of the proposed turbines on the CORS or WAAS GPS antennas, the horizon distance of the nearest GPS antenna to the closest turbine is calculated. If this distance is greater than its separation distance from the turbine, then line-of-sight (LOS) to certain satellites could be obstructed from the GPS antenna, assuming relatively flat terrain with no nearby trees or buildings looking towards the AOI from the GPS antenna.

The distance to the horizon for a given GPS antenna is a function of its height and is given by:

$$D = (2*H_G)^{½} \qquad \text{(Equation 1)}$$

Where:

- D = Distance to horizon from GPS antenna in miles
- H_G = Height of GPS antenna in feet

Using an estimated antenna height of 15 ft AGL, the horizon distance from the nearest CORS station (ILSA) is determined. From Equation 1, this gives a horizon distance of roughly 5 miles or 7.9 km. Since KA21 is the nearest station to the project area, which is located 22.67 km away, no harmful impact to the GPS station antennas is anticipated.

4. Conclusion and Recommendations

Based on the calculated separation distances discussed in Section 3, no harmful impacts to antenna line-of-sight are anticipated to the closest CORS or WAAS GPS antennas.

Furthermore, GPS antennas receive signals from an ample number of medium earth orbit (MEO) satellites that encircle the globe. While the number of GPS satellites varies depending on their life cycle and how many spares are in orbit, there are currently 32 MEO satellites orbiting the Earth along six different orbital planes, each of which are inclined 55 degrees from the equator. Therefore, MEOs form a constellation so that a minimum of four satellites are at least 15 degrees above the horizon at any given time across the globe. And since MEO satellites are in constant motion relative to the Earth, if one becomes obstructed by objects such as trees, grain bins, towers, hills, wind turbines, etc, then other satellites in orbit from the constellation reappear in another part of the sky with a stronger signal.

Therefore, while GPS antennas are capable of detecting signals even from satellites very low on the horizon, it is constantly monitoring and utilizing stronger signals from multiple satellites as they move in different directions across the sky. As a result, Comsearch does not anticipate any harmful impact on the CORS or WAAS system.

5. Contact

Contact person:	David Meyer
Title:	Senior Manager
Company:	Comsearch
Address:	21515 Ridgetop Circle, Suite 300, Sterling, VA 20166
Telephone:	703-726-5656
Fax:	703-726-5595
Email:	David.Meyer@CommScope.com
Web site:	www.comsearch.com

APPENDIX M – INTERFERENCE STUDIES: VCOM CORRESPONDENCE

From: Sarah Bohm
To: Chris Green
Cc: Carsten Ovesen
Subject: [External] Re: Panther Grove 2 - Emergency Response
Date: Friday, September 27, 2024 8:21:35 AM
Attachments: image001.png
image002.png
image003.png

CAUTION! EXTERNAL SENDER
Were you expecting this email? TAKE A CLOSER LOOK. Is the sender legitimate?
DO NOT click links or open attachments unless you are 100% sure that the email is safe.

Good Morning -

I have availability the week of October 7th.

Thank you,

Sarah Bohm
Director of Communications
Vermilion Valley Regional Emergency Communications Joint Authority
844 W Lincoln St., Suite B
Pontiac, IL 61764
Office: 815-842-8089

From: Chris Green <chris.green@enbridge.com>
Sent: Monday, September 23, 2024 9:37 AM
To: Sarah Bohm <sarah.bohm@vcom911.com>
Cc: Carsten Ovesen <cov@cip.com>
Subject: RE: Panther Grove 2 - Emergency Response

Sarah,

Sorry time got away from me. Would you have a few minutes to circle up later in the week or the following week?

Thank you.

Chris Green, PE
Senior Development Manager

ENBRIDGE
C 318-401-0378 | chris.green@enbridge.com
15725 Dallas Parkway, Suite 550, Addison, TX 75001

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From: Sarah Bohm <sarah.bohm@vcom911.com>
Sent: Thursday, September 12, 2024 7:40 AM
To: Chris Green <chris.green@enbridge.com>
Cc: Carsten Ovesen <cov@cip.com>
Subject: [External] Re: Panther Grove 2 - Emergency Response

CAUTION! EXTERNAL SENDER
Were you expecting this email? TAKE A CLOSER LOOK. Is the sender legitimate?
DO NOT click links or open attachments unless you are 100% sure that the email is safe.

Good Morning Mr. Green -

I have reviewed the information you have provided. I do not have any questions at this time.

I am available all day next Monday or after 11 on Tuesday. I will be out of the office September 18th thru the 26th.

Please let me know if either of these dates work for you.

Thank you,

Sarah Bohm
Director of Communications
Vermilion Valley Regional Emergency Communications Joint Authority
844 W Lincoln St., Suite B
Pontiac, IL 61764
Office: 815-842-8089

From: Chris Green <chris.green@enbridge.com>
Sent: Wednesday, September 11, 2024 3:32 PM
To: Sarah Bohm <sarah.bohm@vcom911.com>
Cc: Jesse King <jesse.king@vcom911.com>; Carsten Ovesen <cov@cip.com>
Subject: RE: Panther Grove 2 - Emergency Response

Sarah,

My name is Chris Green and I am the Project Development Manager for the Panther Grove 2 Wind Project that we (Enbridge Inc.) and Copenhagen Infrastructure Partners (CIP) are developing in southwest Livingston County, IL. As you can see in the email below from Jesse King he recommended I reach out to you.

The reason I am reaching out is as you may know Section 56-619(b)(1) requires us to provide the "local emergency service providers (911 operators) copies of the project summary and site plan". As such I have attached a copy of the "site plan" for the Panther Grove 2 project which will include up to 104 turbines with blade tip heights of 640', two 300' tall meteorological towers, a ~150 foot tall ADLS radar tower, operations & maintenance building, project substation, overhead powerline, and a temporary construction laydown yard area. I have also attached the project communication studies and the NTIA approval letter. Please see the microwave study within the interference study.

I have also attached the Project's draft Emergency Response Plan ("ERP") that we will be submitting to the local fire districts and County. We intend to finalize the ERP in conjunction with the fire districts, County, and Vcom if you guys wish to opine.

Would you have a few minutes next week to discuss and for me to introduce myself? Also please let me know if you need any additional information.

Thanks for the time and I look forward to discussing further.

Chris Green, PE
Senior Development Manager

ENBRIDGE
C 318-401-0378 | chris.green@enbridge.com
15725 Dallas Parkway, Suite 550, Addison, TX 75001

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From: Jesse King <jesse.king@vcom911.com>

Sent: Friday, September 6, 2024 7:16 AM
To: Chris Green <chris.green@enbridge.com>
Subject: [External] Re: Panther Grove 2 - Emergency Response

Chris,

You will actually want to talk to the Director of Communications, Sarah Bohm. Her email is sarah.bohm@vcom911.com.

Jesse King
911 Coordinator

Vermilion Valley Regional
Emergency Communications Joint Authority

815-842-8084
844 W. Lincoln St.
Suite B
Pontiac, IL 61764

From: Chris Green <chris.green@enbridge.com>
Sent: Tuesday, September 3, 2024 2:26 PM
To: Brittney Miller <bmiller@livingstoncountyil.gov>; Jesse King <jesse.king@vcom911.com>
Cc: 'uphofflaw@gmail.com' <uphofflaw@gmail.com>; Carsten Ovesen <cov@cip.com>; 'Anders Rydahl Pape' <arp@bluepp.dk>; 'Mohamed Ahmed Elmak' <moae@cisc.dk>
Subject: RE: Panther Grove 2 - Emergency Response

Jesse,

Following up on my email from last week; would you have a few minutes this week to circle up on this?

Thank you sir.

Chris Green, PE
Senior Development Manager

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C 318-401-0378 | chris.green@enbridge.com
15725 Dallas Parkway, Suite 550, Addison, TX 75001

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From: Chris Green
Sent: Tuesday, August 27, 2024 3:09 PM

To: 'Brittney Miller' <bmiller@livingstoncountyil.gov>; 'jesse.king@vcom911.com' <jesse.king@vcom911.com>
Cc: 'uphofflaw@gmail.com' <uphofflaw@gmail.com>; 'Carsten Ovesen' <cov@cip.com>; 'Anders Rydahl Pape' <arp@bluepp.dk>; 'Mohamed Ahmed Elmak' <moae@cisc.dk>
Subject: RE: Panther Grove 2 - Emergency Response

Jesse,

Chris Green here. I hope you are doing well. As you may know we are nearing submitting the PG2 SUP application to Brittney's office within a few weeks. As such we need to satisfy provision 56-619 (b) – Interference which I listed below. I believe you are the correct person to help with the following questions:

1. Are you the POC for the "local emergency service providers (911 operators)" coordination?
    a. If you are the POC is there any other information you need from us beyond 56-616-b (1) and (3)?
2. Would you happen to know who the "providers of weather radar utilized for the safety of the general public" would be besides the National Weather Service?

) The applicant shall provide the applicable microwave transmission providers, providers of weather radar utilized for the safety of the general public, the National Weather Service, and local emergency service providers (911 operators) copies of the project summary and site plan, as set forth in section 56-616(b)(1) and (3) of the Livingston County Code. This project summary shall include a study pertaining to the relationship of the proposed project and microwave transmission providers and local emergency service providers.

Thanks,

Chris Green, PE
Senior Development Manager

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C 318-401-0378 | chris.green@enbridge.com
15725 Dallas Parkway, Suite 550, Addison, TX 75001

enbridge.com
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