

Wind Power GeoPlanner™

AM and FM Radio Report

Copenhagen Wind Farm, LLC



Prepared on Behalf of
OwnEnergy

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COMSEARCH
A CommScope Company

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1. Introduction

In this report, Comsearch analyzed AM and FM radio broadcast stations whose service could potentially be affected by the proposed Copenhagen Wind Farm project in Lewis County, New York.

2. Summary of Results

AM Radio Analysis

Comsearch found three database records¹ for AM stations within approximately 30 kilometers of the project, as shown in Table 1 and Figure 1. These records represent Watertown-based stations WNER, WTNY, and WATN, the first two of which are licensed separately for daytime and nighttime operations.

ID	Call Sign	Status ²	Frequency (kHz)	Transmit ERP ³ (kW)	City	State	Distance to Nearest Turbine (km)
1	WNER	LIC	1410	3.5	WATERTOWN	NY	18.76
2	WNER	LIC	1410	0.058	WATERTOWN	NY	18.76
3	WTNY	LIC	790	1.0	WATERTOWN	NY	18.77
4	WTNY	LIC	790	1.0	WATERTOWN	NY	18.77
5	WATN	LIC	1240	1.0	WATERTOWN	NY	19.56

Table 1: AM Radio Stations

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

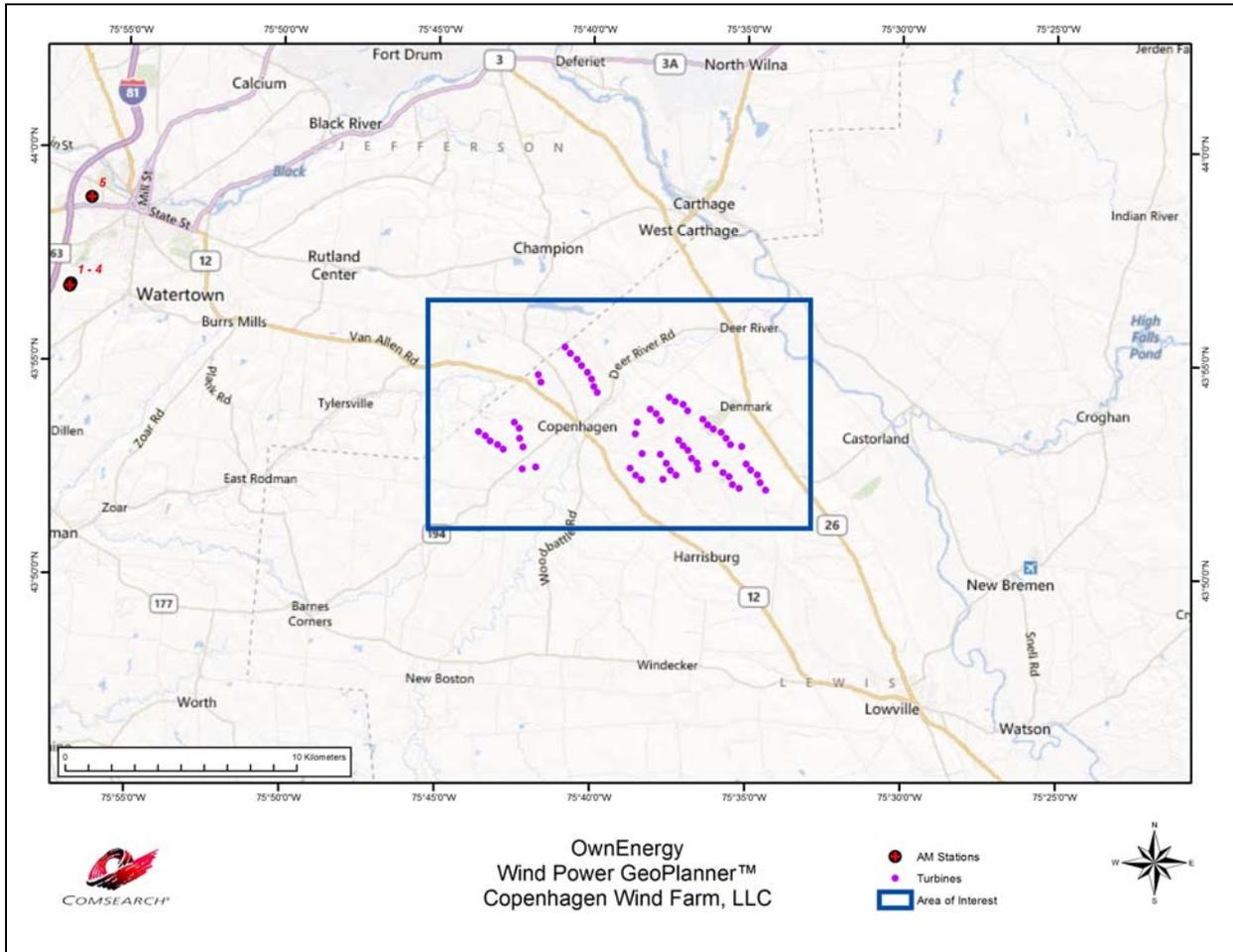


Figure 1: Plot of AM Radio Stations

FM Radio Analysis

Comsearch determined that there were twenty-one database records for FM stations within a 30 kilometer radius of the Copenhagen Wind Farm project, as shown in Table 2 and Figure 2. Twenty of these stations are currently licensed and operational, eight of which are translator stations that operate at low power and have limited range.

ID	Call Sign	Status	Frequency (MHz)	Transmit ERP (kW)	City	State	Distance to Nearest Turbine (km)
1	DW240AN	Unknown	95.9	0.004	COPENHAGEN	NY	0.50
2	WBDR	LIC	106.7	1.8	COPENHAGEN	NY	0.59
3	WJNY	LIC	90.9	7.1	WATERTOWN	NY	2.41
4	WRVJ	LIC	91.7	1.6	WATERTOWN	NY	2.41
5	WKWV	LIC	90.1	0.4	WATERTOWN	NY	5.14
6	WTOJ	LIC	103.1	1.8	CARTHAGE	NY	5.14
7	W272BL	LIC	102.3	0.043	CARTHAGE	NY	8.15
8	WXLD	LIC	89.7	0.22	LOWVILLE	NY	8.25
9	W220BO	LIC	91.9	0.01	LOWVILLE	NY	8.26
10	W255CI	LIC	98.9	0.01	LOWVILLE	NY	8.26
11	W261CP	LIC	100.1	0.019	LOWVILLE	NY	9.97
12	WOTT	LIC	94.1	21.5	CALCIUM	NY	10.46
13	WSLJ	LIC	88.9	0.2	WATERTOWN	NY	11.73
14	WCIZ-FM	LIC	93.3	6.0	WATERTOWN	NY	12.02
15	WFRY-FM	LIC	97.5	97.0	WATERTOWN	NY	12.02
16	WLLG	LIC	99.3	1.0	LOWVILLE	NY	12.77
17	W260BE	LIC	99.9	0.019	WATERTOWN	NY	17.32
18	W281AA	LIC	104.1	0.05	WATERTOWN	NY	19.56
19	WBLH	LIC	92.5	6.0	BLACK RIVER	NY	25.82
20	W255CI	CP	98.3	0.16	LOWVILLE	NY	27.51
21	W206BH	LIC	89.1	0.013	LYONS FALLS	NY	29.49

Table 2: FM Radio Stations

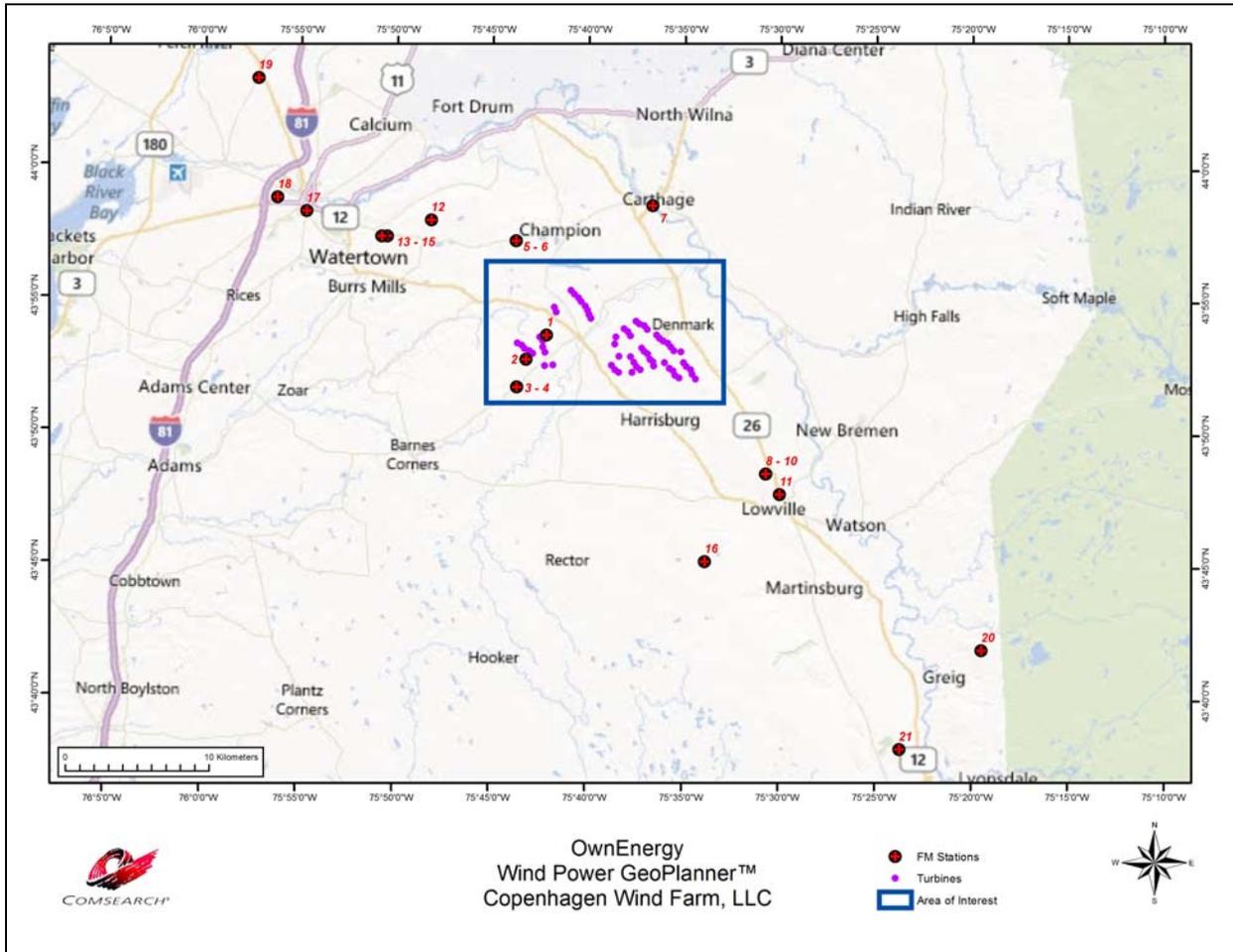


Figure 2: Plot of FM Radio Stations

3. Impact Assessment

Potential problems with AM broadcast coverage are only anticipated when AM broadcast stations with directive antennas are within 3.2 kilometers of wind turbine towers and AM broadcast stations with non-directive antennas are within 0.8 kilometers. The closest station to the Copenhagen Wind Farm project, WNER, is non-directive and located more than 18.7 kilometers from the nearest turbine. Therefore, the proposed wind farm should not impact the coverage of local AM stations.

The coverage of FM stations, when the stations are at distances greater than 4.0 kilometers from wind turbines, is not subject to degradation. In the Copenhagen Wind Farm project area, there are four operational FM stations within the 4 kilometer distance threshold: (1) DW240AN, (2) WBDR, (3) WJNY, and (4) WRVJ. The height of the station antennas above mean sea level are 422 meters, 730 meters, 425 meters and 420 meters, respectively. A depiction of these four stations in relation to the wind turbines is shown below in Figure 3.

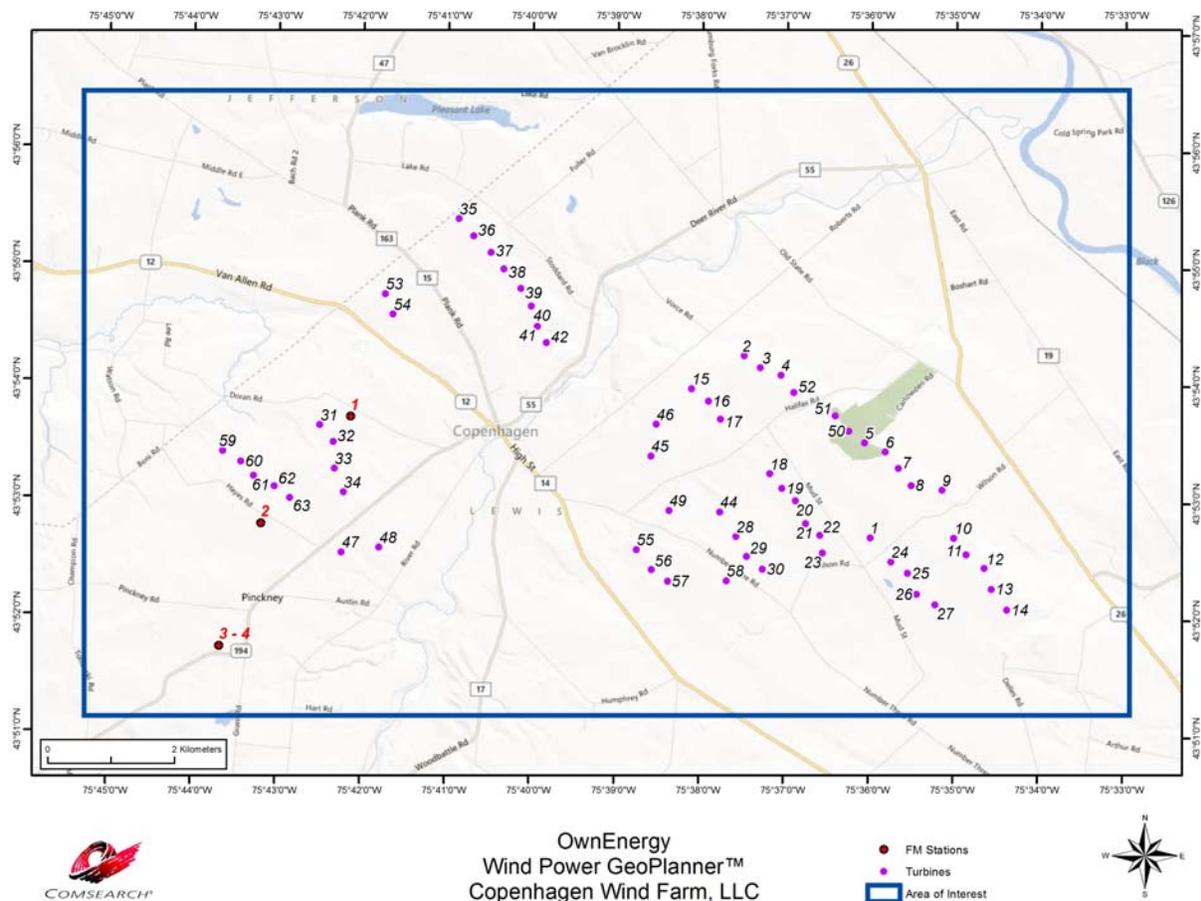


Figure 3: FM Stations DW240AN (ID1), WBDR (ID2), WJNY (ID3), and WRVJ (ID4) Relative to the Copenhagen Wind Farm Turbines

The proposed wind turbines will have a hub height of 96 meters and a blade diameter of 100 meters. To determine which wind turbines could obstruct the stations' transmit signals Comsearch evaluated the relative heights of the wind turbine blades in comparison to the FM station antennas with respect to their heights above mean sea level. The heights above local ground level were not used in the analysis because of the hilly nature of the terrain in the project area. Table 3 shows the result of this obstruction analysis, where a designation of "c" indicates sufficient clearance and a designation of "x" indicates a potential obstruction.

Turbine ID	Latitude	Longitude	Ground Height AMSL (m)	Blade Ht (m)	DW240AN	WBDR	WJNY	WRVJ
31	43.893791	-75.708222	426.7	472.7-572.7	c	c	x	x
32	43.891427	-75.705577	426.7	472.7-572.7	c	c	x	x
33	43.887600	-75.705308	439.3	485.3-585.3	c	c	x	x
34	43.884251	-75.703503	438.8	484.8-584.8	c	c	x	x
35	43.923292	-75.681140	366.9	412.9-512.5	x	c	c	c
36	43.920844	-75.678238	371.5	417.5-517.5	x	c	c	c
37	43.918538	-75.674741	372.3	418.3-518.3	x	c	c	c
38	43.916172	-75.672217	372.2	418.2-518.2	x	c	c	c
39	43.913446	-75.668886	367.9	413.2-513.2	x	c	c	c
40	43.910892	-75.666779	371.8	417.8-517.8	x	c	c	c
41	43.908044	-75.665523	371.8	417.8-517.8	x	c	c	c
42	43.905714	-75.663724	371.8	417.8-517.8	x	c	c	c
47	43.875702	-75.703786	436.9	482.9-582.9	c	c	x	x
48	43.876400	-75.696393	427.6	473.6-573.6	c	c	x	x
53	43.912536	-75.695537	378.6	424.6-524.6	x	c	c	x
54	43.909607	-75.693963	374.9	420.9-520.9	x	c	c	x
59	43.890001	-75.727296	429.1	475.0-575.0	c	c	x	x
60	43.888498	-75.723709	436.8	482.8-582.8	c	c	x	x
61	43.886497	-75.721155	437.1	483.1-583.1	c	c	x	x
62	43.885026	-75.717109	436.4	482.4-582.4	c	c	x	x
63	43.883373	-75.714018	441.7	487.7-587.7	c	c	x	x

The results of the analysis in Table 3 indicate a total of 21 turbines could potentially obstruct some of the four FM stations. For example, station WRVJ could be obstructed by 13 of the wind turbines identified in the table. However, station WBDR should not be obstructed by any of the planned wind turbines because this station's antenna is at a height of 730 meter above mean sea level, well above the blade tip height of all of the wind turbines. The degree to which the potentially affected FM stations could be impacted by the wind turbines depends on the amount of listeners in the specific areas where the signal could be blocked or degraded. The spinning blades will reduce the coverage of the stations in the azimuths on the other side of the turbines where the signal is obstructed.

4. Conclusions and Recommendations

No impact to the AM stations near the Copenhagen Wind Farm is predicted. However, three FM stations in the area could have their coverage degraded by the planned wind turbines: DW240AN, WJNY and WRVJ⁴. This degradation may be avoided by removing or relocating the wind turbines that cause the obstruction, if this is a possibility. Alternatively, the FM station owners could be notified that their station's coverage may be affected by the wind turbines when they are installed. The stations could try and avoid the loss of coverage by relocating their own transmit antenna; either by moving it higher on the tower they are presently on so they can clear the wind turbine blades or by moving to a new tower location. They could also add an auxiliary antenna in the potentially reduced coverage area to re-establish the lost coverage.

5. Contact Us

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

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⁴ DW240AN broadcasts on 95.9 MHz and is a translator station owned by Copenhagen Christian Radio. Its FCC license was canceled on October 18, 2010 and is most likely no longer operating. WJNY broadcasts on 90.9 MHz and is owned by The Public Broadcasting Council of Central New York. WRVJ broadcasts on 91.7 MHz and is owned by the State University of New York at Oswego.