

# Wind Power GeoPlanner™

## Off-Air TV Analysis

Aurora Wind Project



Prepared on Behalf of  
Aurora Wind Project,  
LLC

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**COMSEARCH**  
A CommScope Company

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## 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 Aurora Wind Project in Williams and Mountrail Counties, North Dakota. 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.

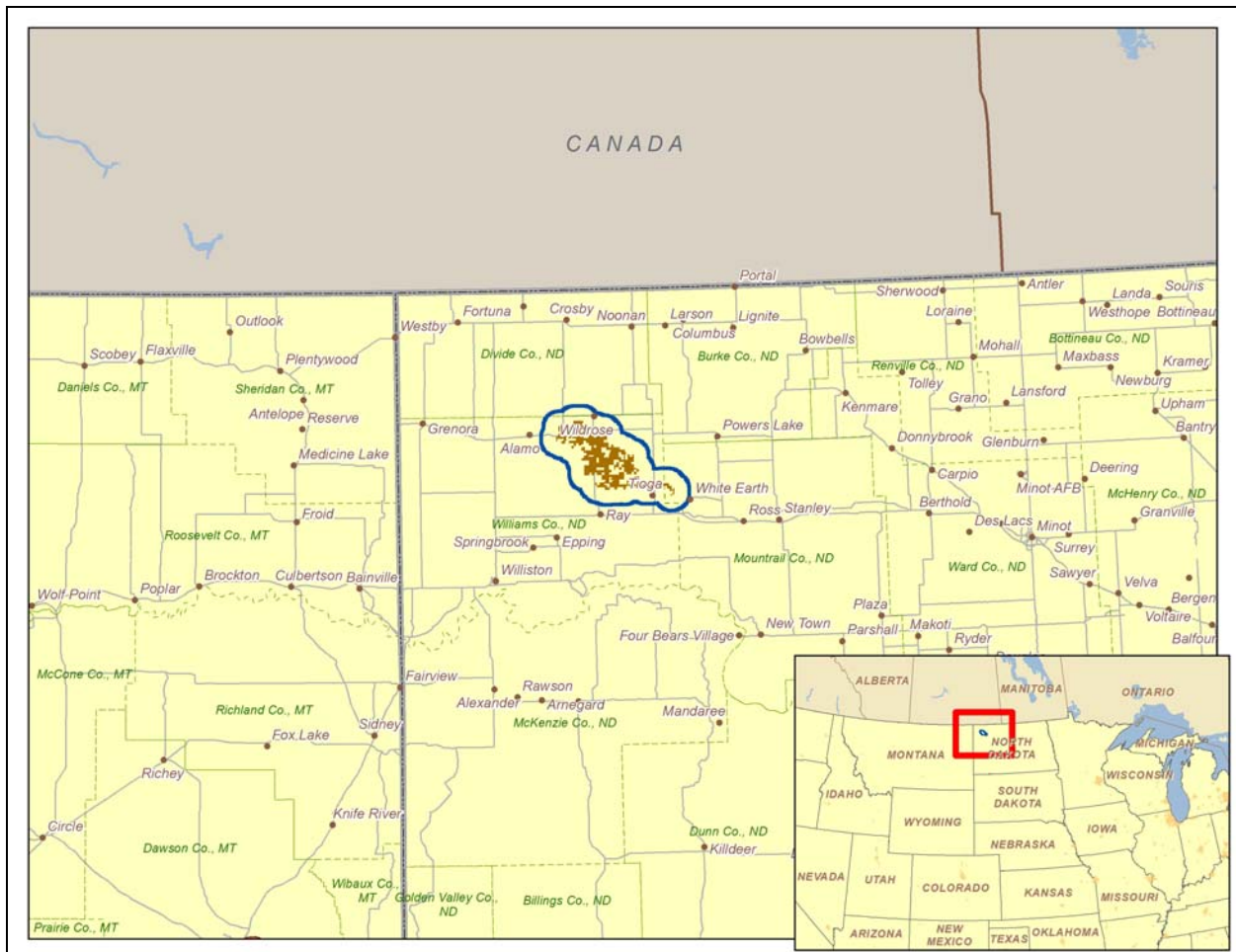
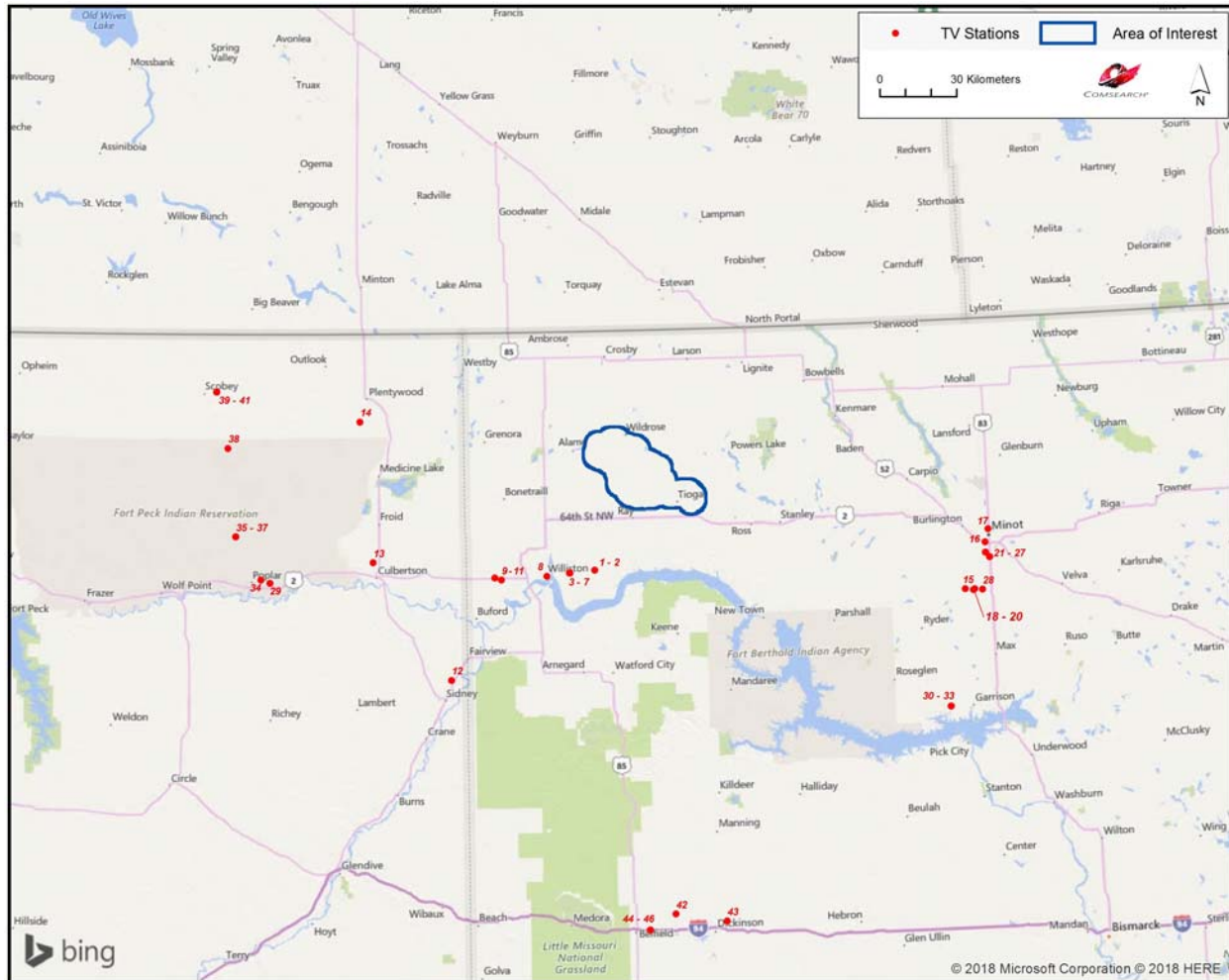


Figure 1: Wind Farm Project Area and Local Communities

To begin the analysis, Comsearch compiled all off-air television stations<sup>1</sup> within 150 kilometers of the project area of interest (AOI). Appendix A contains a tabular summary of these stations. A plot depicting their locations appears in Figure 2, below.



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

TV stations at a distance of 100 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, below, and a plot depicting their locations is provided in Figure 3. There are a total of fourteen database records for stations within approximately 100 kilometers of the limits of the project

<sup>1</sup> 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](http://www.comsearch.com/files/data_license.pdf).

AOI. Of these stations, only nine are currently licensed and operating, six 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.

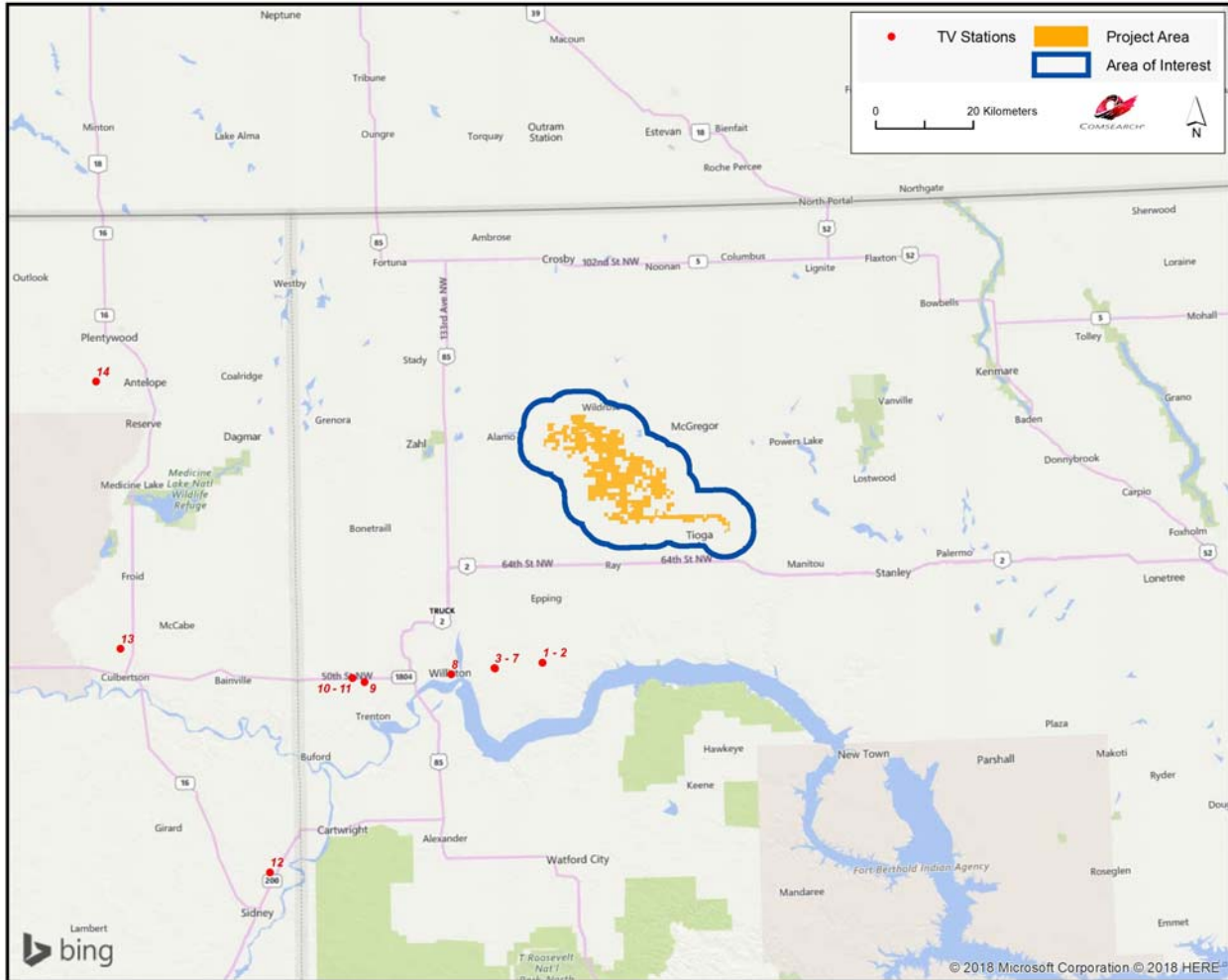


Figure 3: Plot of Off-Air TV Stations within 100 Kilometers of Project Area

ID	Call Sign	Status	Service <sup>2</sup>	Channel	Transmit ERP <sup>3</sup> (kW)	Latitude (NAD 83)	Longitude (NAD 83)	Distance to Center of Project (km)
1	KXND-LD	CP MOD	LD	38	15.0	48.163611	-103.368889	41.65
2	KXND-LD	LIC	LD	38	15.0	48.163611	-103.368889	41.65
3	K16KS-D	CP	LD	16	2.75	48.155389	-103.501222	47.55
4	K33MY-D	CP	LD	33	2.75	48.155389	-103.501222	47.55
5	K36MQ-D	CP	LD	36	2.75	48.155389	-103.501222	47.55
6	K46ME-D	CP	LD	46	2.75	48.155389	-103.501222	47.55
7	KXND-LD	LIC	TX	38	20.5	48.154944	-103.500611	47.56
8	K40DE	LIC	TX	40	0.851	48.145278	-103.621583	54.15
9	KUMV-TV	LIC	DT	8	6.0	48.133889	-103.860556	68.30
10	KWSE	LIC	DT	11	84.9	48.141667	-103.893333	69.77
11	KXMD-TV	LIC	DT	14	100.0	48.141667	-103.893333	69.77
12	K13IG-D	LIC	LD	13	0.014	47.784167	-104.126861	109.25
13	K34GY-D	LIC	LD	34	0.354	48.200000	-104.532167	109.80
14	K46GS-D	LIC	LD	46	0.3	48.693056	-104.596056	110.94

*Table 1: Off-Air TV Stations within 100 Kilometers of Project Area*

<sup>2</sup> Definitions of service and status codes:

DT – Digital television broadcast station  
LD – Low power digital television broadcast station  
TX – Translator station  
LIC – Licensed and operational station  
CP – Construction permit granted  
CP MOD – Modification of construction permit  
APP – Application for construction permit, not yet operational

<sup>3</sup> ERP = Transmit Effective Radiated Power

### 3. Impact Assessment

Based on a contour analysis of the licensed stations within 100 kilometers of the Aurora Wind Project, it was determined that the three full-power digital stations, identified below in Table 2, may have their reception disrupted in and around the project. The areas primarily affected would include TV service locations within 10 kilometers of the wind energy project 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.

However, based on the low number of full-power TV channels available in the immediate vicinity of the project area, it is unlikely that off-air television stations are the primary mode of television service for the local communities. TV cable service, where available, and direct broadcast satellite service (DBS) are more likely the dominant modes of service delivery.

ID	Call Sign	Status	Service <sup>4</sup>	Channel	Transmit ERP <sup>5</sup> (kW)	Latitude (NAD 83)	Longitude (NAD 83)	Distance to Center of Project (km)
9	KUMV-TV	LIC	DT	8	6.0	48.133889	-103.860556	68.30
10	KWSE	LIC	DT	11	84.9	48.141667	-103.893333	69.77
11	KXMD-TV	LIC	DT	14	100.0	48.141667	-103.893333	69.77

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

<sup>4</sup> Definitions of service and status codes:  
DT – Digital television broadcast station  
LIC – Licensed and operational station

<sup>5</sup> ERP = Transmit Effective Radiated Power

## **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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Web site:	www.comsearch.com

## Appendix A

ID	Call Sign	Status	Service <sup>6</sup>	Channel	Transmit ERP <sup>7</sup> (kW)	Latitude (NAD 83)	Longitude (NAD 83)	Distance to Center of Project (km)
1	KXND-LD	CP MOD	LD	38	15.0	48.163611	-103.368889	41.65
2	KXND-LD	LIC	LD	38	15.0	48.163611	-103.368889	41.65
3	K16KS-D	CP	LD	16	2.75	48.155389	-103.501222	47.55
4	K33MY-D	CP	LD	33	2.75	48.155389	-103.501222	47.55
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7	KXND-LD	LIC	TX	38	20.5	48.154944	-103.500611	47.56
8	K40DE	LIC	TX	40	0.851	48.145278	-103.621583	54.15
9	KUMV-TV	LIC	DT	8	6.0	48.133889	-103.860556	68.30
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12	K13IG-D	LIC	LD	13	0.014	47.784167	-104.126861	109.25
13	K34GY-D	LIC	LD	34	0.354	48.200000	-104.532167	109.80
14	K46GS-D	LIC	LD	46	0.3	48.693056	-104.596056	110.94
15	KNDM	LIC	DT	24	50.0	48.053889	-101.434722	134.60
16	KMOT	LIC	DT	10	7.69	48.215556	-101.318611	137.24
17	K42IM-D	LIC	LD	42	1.0	48.260833	-101.299861	137.47
18	K23MB-D	CP	LD	23	15.0	48.050556	-101.390833	137.77
19	KSRE	LIC	DT	40	146.0	48.050556	-101.390833	137.77
20	KMCY	LIC	DT	14	40.0	48.053056	-101.385278	138.05
21	K30NA-D	CP	LD	30	5.0	48.179361	-101.318722	138.25
22	K32KW-D	CP	LD	32	5.0	48.179361	-101.318722	138.25
23	K33MQ-D	CP	LD	33	5.0	48.179361	-101.318722	138.25
24	K38OK-D	CP	LD	38	5.0	48.179361	-101.318722	138.25
25	K21GQ	LIC	TX	21	10.0	48.163333	-101.299167	140.14
26	K21GQ	CP	LD	21	2.5	48.163333	-101.299167	140.14
27	K27LX-D	CP	LD	27	15.0	48.163333	-101.299167	140.14
28	KXMC-TV	LIC	DT	13	16.1	48.050000	-101.342778	141.13

<sup>6</sup> Definitions of service and status codes :

TV – Analog television broadcast station

DT – Digital television broadcast station

DS – Digital special temporary authority (STA)

LP – Low power analog television broadcast station

LD – Low power digital television broadcast station

CA – Class A analog television broadcast station

DC – Class A digital television broadcast station

TX – Translator station

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

<sup>7</sup> ERP = Transmit Effective Radiated Power

ID	Call Sign	Status	Service <sup>6</sup>	Channel	Transmit ERP <sup>7</sup> (kW)	Latitude (NAD 83)	Longitude (NAD 83)	Distance to Center of Project (km)
29	K05KK-D	LIC	LD	5	0.037	48.127778	-105.073028	150.60
30	K21MK-D	CP	LD	21	5.0	47.644806	-101.534417	151.68
31	K27MH-D	CP	LD	27	5.0	47.644806	-101.534417	151.68
32	K43OI-D	CP	LD	43	5.0	47.644806	-101.534417	151.68
33	K48OE-D	CP	LD	48	5.0	47.644806	-101.534417	151.68
34	K13PZ-D	LIC	LD	13	0.054	48.140278	-105.121361	153.67
35	K22KY-D	LIC	LD	22	0.245	48.291111	-105.253028	159.61
36	K48IA-D	LIC	LD	48	0.245	48.291111	-105.253028	159.61
37	K50GU-D	LIC	LD	50	0.245	48.291111	-105.253028	159.61
38	K31MJ-D	LIC	LD	31	1.052	48.600556	-105.296083	161.00
39	K03DP-D	LIC	LD	3	0.03	48.797500	-105.357306	168.11
40	K13MA-D	LIC	LD	13	0.038	48.797500	-105.357306	168.11
41	NEW	APP	LD	26	0.239	48.797500	-105.357306	168.11
42	KQCD-TV	LIC	DT	7	11.3	46.948056	-102.990833	172.78
43	KNDX-LD	LIC	LD	38	3.3	46.918889	-102.730167	178.17
44	K22KG-D	CP	LD	22	1.5	46.894361	-103.124111	178.48
45	K31LR-D	CP	LD	31	1.5	46.894361	-103.124111	178.48
46	K46MQ-D	CP	LD	46	1.5	46.894361	-103.124111	178.48

*Table A: Off-Air TV Stations within 150 Kilometers of Project Area*