



Executive Summary – Wind Power GeoPlanner™

Licensed Microwave Search & Worst Case Fresnel Zone

Comsearch performed an analysis to evaluate the potential effects of the planned Potential Wind Energy Project in McIntosh County, North Dakota on existing non-Federal Government microwave telecom systems.

**Microwave Search Results:** Comsearch’s Wind Power GeoPlanner™ provides a graphical representation of affected microwave paths and provides supporting technical parameters. The microwave path data is overlaid on topographic basemaps. Comsearch identified one microwave path that intersects the project area (see Figure 1 and Table 1 below).

Comsearch then calculated a Worst Case Fresnel Zone (WCFZ) for each microwave path in the project area. The mid-point of a full microwave path is the location where the widest (or worst case) Fresnel zone occurs. Fresnel zones are calculated for each path using the following formula.

$$R_n \cong 17.3 \sqrt{\frac{n}{FGHz} \left( \frac{d_1 d_2}{d_1 + d_2} \right)}$$

Where,

R<sub>n</sub> = First Fresnel Zone Radius, meters

n = The Number 1

FGHz = Frequency of Microwave Link, GHz

d<sub>1</sub> = Distance to Wind Turbine from Microwave Station 1, km

d<sub>2</sub> = Distance to Wind Turbine from Microwave Station 2, km

*note: For WCFZ calculation d<sub>1</sub> = d<sub>2</sub>*

The calculated WCFZ radius, giving the linear path an area or swath, buffers each microwave path in the project area. The distance unit is in meters and can be found in the column attribute “WCFZ.” In general, this is the XY area where the planned wind turbines should be avoided, if possible. These areas are shown in Figure 2.

Please note that because the turbine locations were not provided, we could not determine if any potential obstruction cases exist between the planned wind turbines and the microwave systems. If the latitude and longitude values for turbine locations are provided, Comsearch can identify specific microwave telecom paths and turbines where a potential XY conflict exists. Additionally, when wind turbines need to be located inside a WCFZ, Comsearch can provide a detailed clearance study, which considers the vertical Z-height clearance objectives.

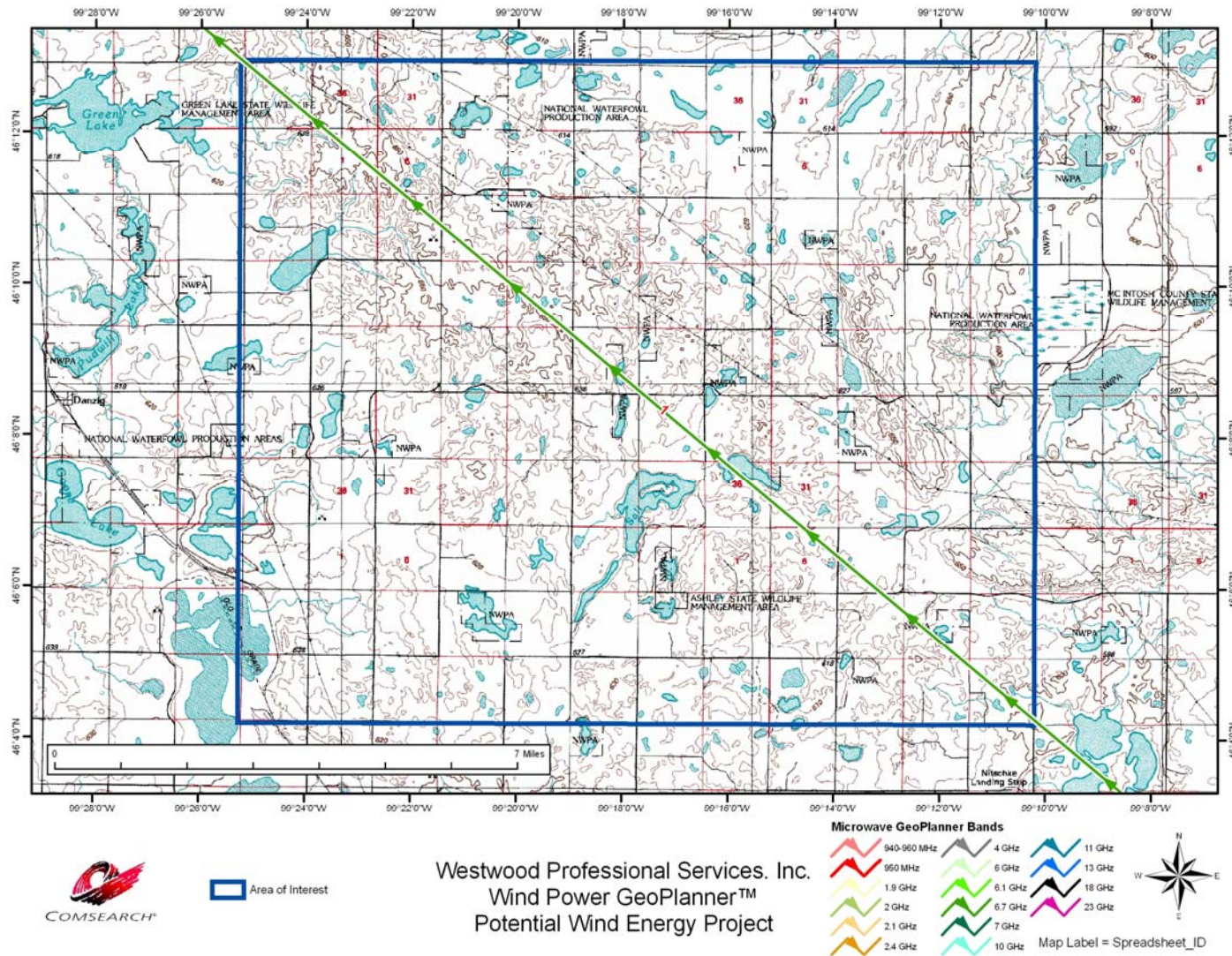


**Westwood Professional Services, Inc.  
Potential Wind Energy Project**

**Map Projection:** The ESRI® Shapefiles contained in the enclosed GeoPlanner CD are in NAD 83 UTM Zone 14 projected coordinate system.

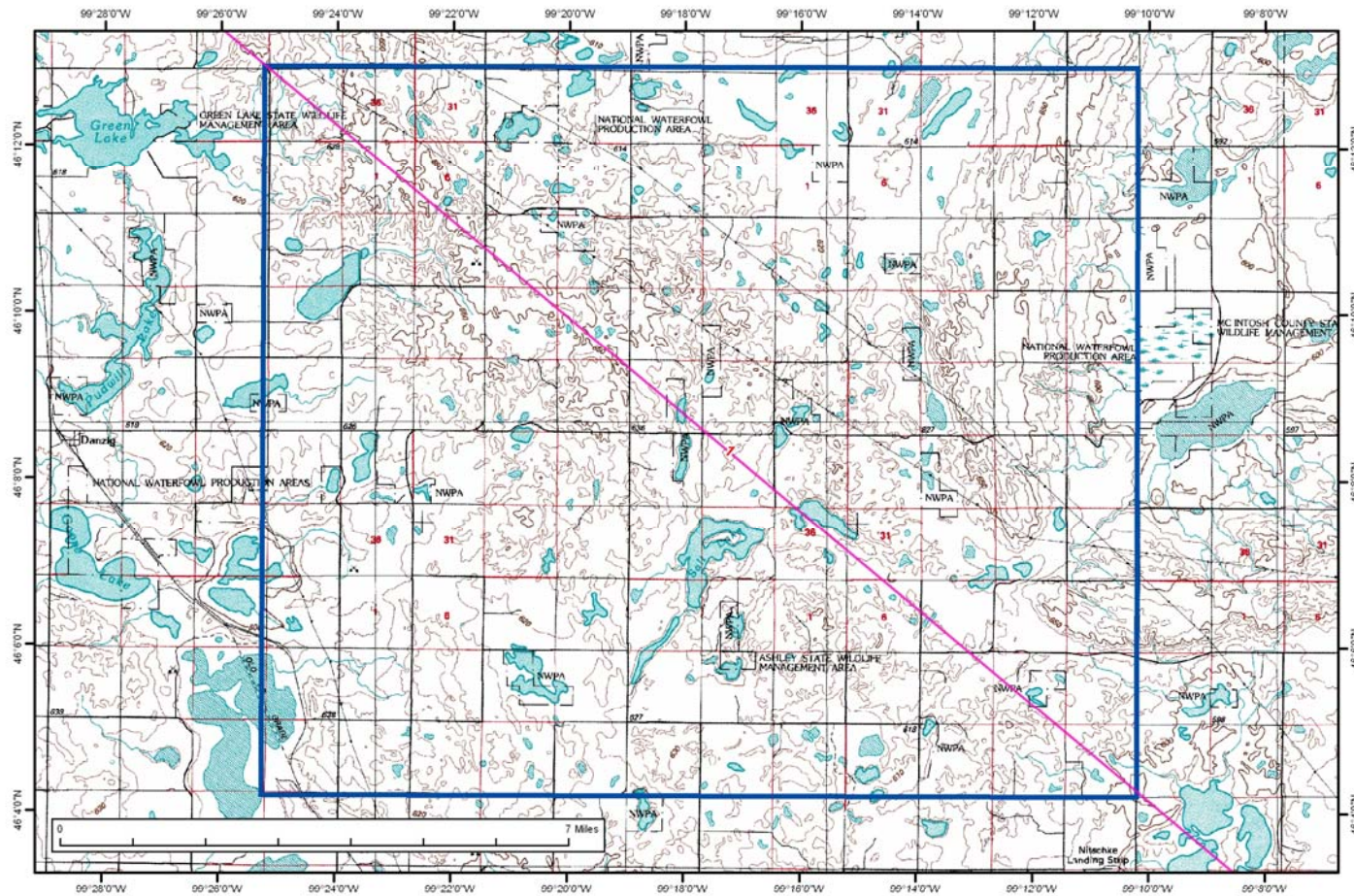
**Comsearch Contact:**

Denise Finney, Account Manager  
Phone: (703) 726-5650 Fax: (703) 726-5595  
Email: [dfinney@comsearch.com](mailto:dfinney@comsearch.com)



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Figure 1 – Wind Power GeoPlanner™



Westwood Professional Services, Inc.  
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Potential Wind Energy Project

WCFZ  
Area of Interest



Map Label = Spreadsheet\_ID

Figure 2 – Wind Power GeoPlanner™ & WCFZ



ID	Name Site 1	Name Site 2	Call Sign Site 1	Call Sign Site 2	Band Name	Licensee	WCFZ (m)
1	FORBES	WISHEK	WBD235	WBD236	Upper 6 GHz	BASIN ELECTRIC POWER COOPERATIVE	27.89

***Table 1 – Microwave GeoPlanner Links Considered in Analysis  
(See enclosed mw\_geopl.xls for more detailed information and  
GP\_dict\_matrix\_description.xls for field description)***



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 703-726-5500

## Land Mobile Radio (LMR) in the Vicinity of a Proposed Wind Project Located in McIntosh County, North Dakota

Comsearch was contracted by Westwood Professional Services, Inc. to identify and locate the Land Mobile Radio (LMR) operators in the vicinity of a proposed project (the Project) located in McIntosh County, North Dakota. Comsearch determined that there were 28 LMR systems registered in the Project area and within approximately 15 miles of the center of the Project site. Table 1 identifies the LMR systems and lists their pertinent parameters and owner/operator. Note that the majority of the LMR operators in the area are governmental agencies, i.e., the County of McIntosh, medical entities or utility companies in the area. Figure 1 shows the location of the LMR repeaters within the Project area of interest and in the adjacent areas around the proposed Project.

**Table 1 - LMR Repeater Sites in the Vicinity of the Proposed Project**

Location	State	Latitude	Longitude	Frequency - MHz	Owner - Operator
ASHLEY	ND	46.03497222220	-99.36983333330	155.37000000	MC INTOSH, COUNTY OF
ASHLEY	ND	46.03497222220	-99.36983333330	155.43000000	MC INTOSH, COUNTY OF
ASHLEY	ND	46.03497222220	-99.36983333330	155.50500000	MC INTOSH, COUNTY OF
GACKLE	ND	46.12636111110	-99.07205555560	158.85000000	GACKLE-STREETER PUBLIC SCHOOL
ASHLEY	ND	46.03386111110	-99.38122222220	155.22000000	ASHLEY PUBLIC SCHOOL
ASHLEY	ND	46.03386111110	-99.38122222220	153.86000000	MCINTOSH, COUNTY OF
WISHEK	ND	46.26052777780	-99.51816666670	155.04000000	MC INTOSH, COUNTY OF
WISHEK	ND	46.26108333330	-99.51816666670	155.04000000	MC INTOSH, COUNTY OF
KULM	ND	46.11136111110	-99.06038888890	461.52500000	JAMESTOWN COMMUNICATIONS INC
WISHEK	ND	46.25552777780	-99.55038888890	155.34000000	WISHEK COMMUNITY HOSPITAL
WISHEK	ND	46.25552777780	-99.55038888890	155.38500000	WISHEK COMMUNITY HOSPITAL
WISHEK	ND	46.25552777780	-99.55038888890	163.25000000	WISHEK COMMUNITY HOSPITAL
ASHLEY	ND	46.03913888890	-99.37233333330	152.00750000	ASHLEY MEDICAL CENTER
ASHLEY	ND	46.03913888890	-99.37233333330	155.34000000	ASHLEY MEDICAL CENTER
ASHLEY	ND	46.03913888890	-99.37233333330	155.40000000	ASHLEY MEDICAL CENTER
KULM	ND	46.11136111110	-99.06038888890	461.47500000	ROTT, ELLIOTT
ASHLEY	ND	46.04163888890	-99.37650000000	457.20000000	KEM ELECTRIC COOPERATIVE INC
WISHEK	ND	46.14358333330	-99.56622222220	457.20000000	KEM ELECTRIC COOPERATIVE INC
ASHLEY	ND	46.04163888890	-99.37650000000	457.20000000	KEM ELECTRIC COOPERATIVE INC

WISHEK	ND	46.14358333330	-99.56622222220	457.20000000	KEM ELECTRIC COOPERATIVE INC
LEHR	ND	46.32080555560	-99.28788888890	152.93000000	BADER, RICK
ASHLEY	ND	46.03913888890	-99.37233333330	158.95500000	NORTH DAKOTA, STATE OF
GACKLE	ND	46.12636111110	-99.07344444440	158.95500000	NORTH DAKOTA, STATE OF
KULM	ND	46.11136111110	-99.06038888890	857.83750000	Midwest Management Inc.
KULM	ND	46.11136111110	-99.06038888890	462.12500000	JAMESTOWN COMMUNICATIONS INC
FAULKTON	SD	46.10830555560	-99.31094444440	461.82500000	SCHILDER, STEVEN
ASHLEY	ND	45.93063888890	-99.34097222220	153.12500000	SCHAUER, RONALD
ASHLEY	ND	46.03497222220	-99.36983333330	154.08500000	NORTH DAKOTA, STATE OF

MHz=Megahertz

The frequencies of operation of the LMR repeaters are generally unaffected by the presence of wind turbines. Very little, if any, change in the coverage of the repeaters will occur when the wind turbines are installed. It is the intention of the wind energy site developers that their new facilities will not have an impact on existing telecommunication infra-structures including LMR. Although no impact is anticipated, the developer can be relied on to take steps to accommodate the LMR operators if a change in coverage of the LMR systems does occur after the wind turbines are installed. If there is a reported change in coverage it can be readily corrected by repositioning or adding repeaters that operate with the LMR system mobile units. This can be accomplished by adding or positioning the repeaters at locations within the wind facility. Repeater antennas can be installed on utility, meteorological or other structures in the wind facility if needed. The plans for the installation of these repeater antennas for this purpose should be given to the local government oversight authority for review and approval before actual installation is undertaken.





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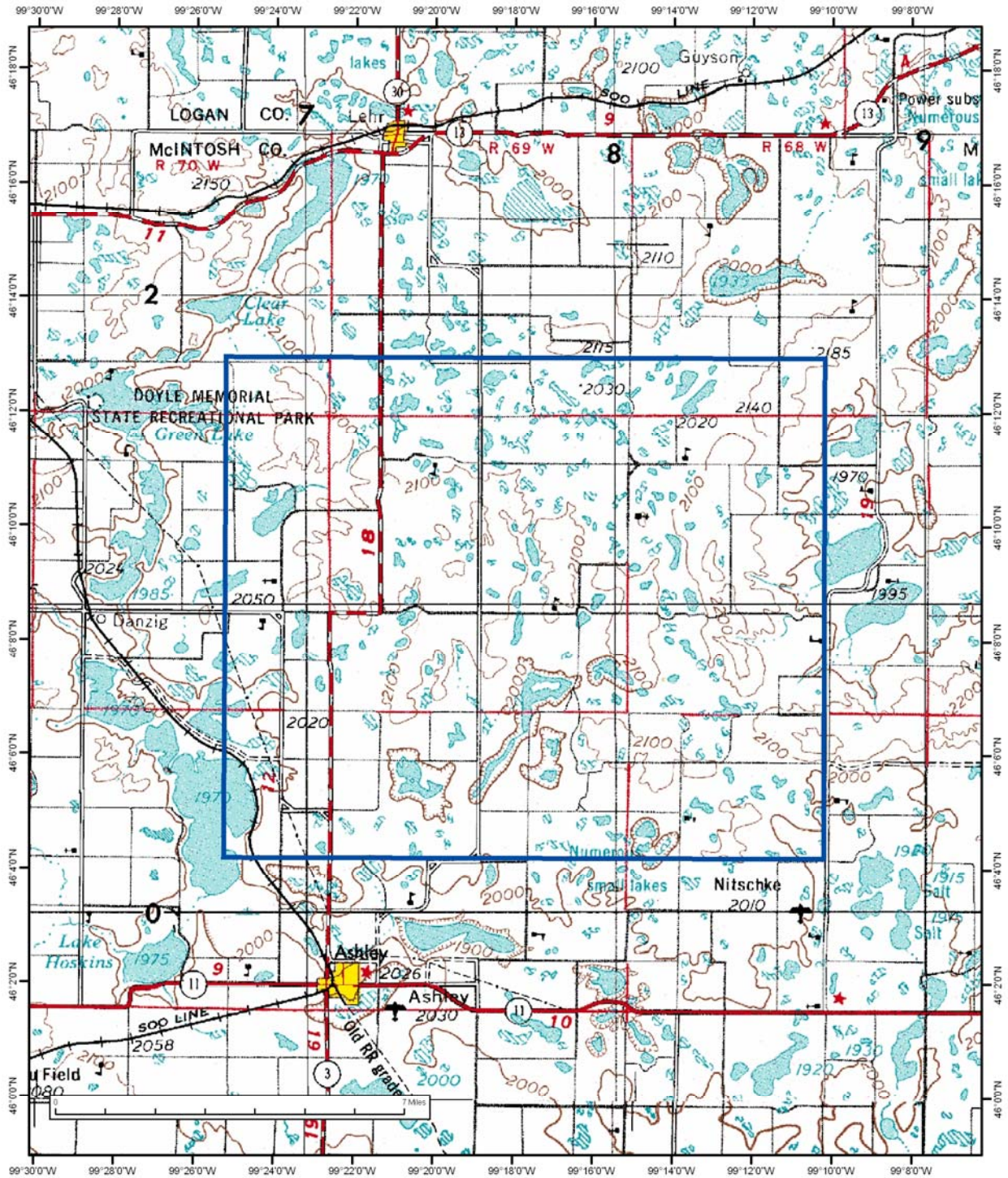
### **Analysis of AM and FM Broadcast Station Operations in the Vicinity of the Proposed Wind Energy Project in McIntosh County, North Dakota**

Comsearch was contracted by Westwood Professional Services Inc., to determine if there would be any degradation to the operational coverage of AM and FM Radio Broadcast Stations located in the vicinity of their proposed Wind Energy Project in McIntosh County, North Dakota.

Comsearch determined that there were no licensed operating AM stations within a 15 mile search radius of the McIntosh County Wind Energy Project. Therefore, there will be no problems with AM broadcast coverage in the area because wind turbines have to be within 2 miles of an AM broadcast antenna to pose a potential threat to the station's coverage.

There are also no license records for FM stations within 15 miles of the center of the McIntosh County Wind Energy Project. FM stations at distances greater than 3 miles from any of the wind turbines will have little or no affect on the FM Station coverage.

The results of the database search of AM and FM stations in the McIntosh County Wind Energy project area show that none of the stations, AM or FM, will be located close enough to the planned wind turbines to be negatively affected. Figure 1 is a map of the McIntosh County Wind Energy site.



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Potential Wind Energy Project

Area of Interest



Figure 1 McIntosh County Wind Energy Project Site Map



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## Off-Air TV Reception Analysis at a Proposed Project in McIntosh County, North Dakota

Comsearch was contracted by Westwood Professional Services, Inc. to identify all of the off-air television stations within 100-mile radius of a proposed Wind Energy Project in McIntosh, North Dakota. Off-air stations are television broadcasters that transmit signals that can be received directly on a television receiver from terrestrially located broadcast facilities. Comsearch examined the coverage of the off-air TV stations and the communities in the area that could potentially have degraded television reception because of the location of the wind turbines. The proposed wind energy facility boundaries and local communities are plotted in the map shown in Figure 1 of this memorandum. Table 1 lists the off-air television stations within 100 miles of the wind project. Figure 2 shows all of the television stations within 100 mile radius of the proposed wind facility.

**Table 1 Off-Air TV Channels within 100 Miles of the Proposed Wind Energy Project**

Location	State	Call Sign	Channel	Service	Status	Distance
JAMESTOWN	ND	K02DD	2	TX	LIC	58.70 mi
SENECA	SD	-	2	TA	-	75.40 mi
BISMARCK	ND	KBME-TV	3	TV	LIC	78.33 mi
BISMARCK	ND	KFYR-TV	5	TV	LIC	79.08 mi
LISBON	ND	K07NE	7	TX	LIC	80.15 mi
JAMESTOWN	ND	KJRR	7	TV	LIC	59.44 mi
JAMESTOWN	ND	KJRR	7	DT	CP	59.44 mi
JAMESTOWN	ND	KJRR	7	DT	APP	59.44 mi
ABERDEEN	SD	K07JD	7	TX	LIC	60.51 mi
ABERDEEN	SD	KABY-TV	9	TV	LIC	98.62 mi
ABERDEEN	SD	KABY-TV	9	DT	CP	98.50 mi
LOWRY	SD	KQSD-TV	11	TV	LIC	68.51 mi
LOWRY	SD	KQSD-TV	11	TV	APP	68.51 mi
LOWRY	SD	KQSD-TV	11	TV	APP	68.51 mi
LOWRY	SD	KQSD-TV	11	DT	CP MOD	68.51 mi
BISMARCK	ND	KXMB-TV	12	TV	LIC	78.57 mi
BISMARCK	ND	KXMB-TV	12	DT	CP	78.54 mi
ABERDEEN	SD	K13ZC-D	13	LD	CP	60.51 mi
LOWRY	SD	KQSD-TV	15	DT	LIC	68.51 mi
BISMARCK	ND	KBMY	16	DT	LIC	82.92 mi
BISMARCK	ND	KBMY	16	DT	CP	78.48 mi
ABERDEEN	SD	KDSD-TV	16	TV	LIC	90.05 mi

BISMARCK	ND	KBMY	17	TV	LIC	78.45 mi
BISMARCK	ND	KBMY-DR	17	DR	APP	78.45 mi
ABERDEEN	SD	KDSD-TV	17	DT	LIC	90.04 mi
ABERDEEN	SD	KDSD-TV	17	DT	APP	90.04 mi
ABERDEEN	SD	KDSD-TV	17	DT	APP	90.04 mi
JAMESTOWN	ND	KJRR-DR	18	DR	GRANT	59.44 mi
ELLENDALE	ND	KJRE	19	TV	LIC	23.24 mi
ELLENDALE	ND	KJRE	20	DS	STA	23.24 mi
ELLENDALE	ND	KJRE	20	DT	LIC	23.24 mi
ABERDEEN	SD	K35FJ	20	TX	LIC	60.99 mi
BISMARCK	ND	KBME-TV	22	DT	LIC	78.32 mi
BISMARCK	ND	KXMB-TV	23	DT	LIC	78.32 mi
ABERDEEN	SD	K24DT	24	TX	LIC	59.39 mi
BISMARCK	ND	KNDX	26	TV	LIC	78.04 mi
BISMARCK	ND	KNDX	26	DT	CP	78.04 mi
BISMARCK	ND	K28JP-D	28	LD	CP	88.31 mi
ABERDEEN	SD	KABY-TV	28	DT	LIC	98.50 mi
BISMARK	ND	KFYR-TV	31	DS	STA	78.99 mi
BISMARCK	ND	KFYR-TV	31	DT	LIC	78.99 mi
BISMARCK	ND	KIJC-LP	33	TX	CP	84.95 mi
ABERDEEN	SD	NEW	33	TX	APP	59.60 mi
ABERDEEN	SD	NEW	33	TX	APP	60.68 mi
ABERDEEN	SD	NEW	33	TX	APP	60.68 mi
ABERDEEN	SD	NEW	33	TX	APP	59.22 mi
ABERDEEN	SD	NEW	33	TX	APP	65.81 mi
BISMARCK	ND	K34IT-D	34	LD	CP	88.31 mi
JAMESTOWN	ND	K35HT	35	TX	CP	66.36 mi
ABERDEEN	SD	K35IG-D	35	LD	CP	59.22 mi
BISMARCK	ND	K36HY	36	TX	CP	84.95 mi
BISMARCK	ND	K39IF	39	TX	CP	84.94 mi
ABERDEEN	SD	K39CZ	39	TX	LIC	59.39 mi
BISMARCK	ND	K42HD	42	TX	CP	84.95 mi
BISMARCK	ND	K43JQ	43	TX	LIC	85.47 mi
ABERDEEN	SD	K43JW	43	TX	CP	60.68 mi
BISMARCK	ND	K44HU	44	TX	CP	78.04 mi
BISMARCK	ND	K46DY	46	TX	LIC	84.94 mi
BISMARCK	ND	K46DY	46	LD	CP	84.94 mi
ABERDEEN	SD	NEW	48	TX	APP	60.68 mi
BISMARCK	ND	NEW	49	TX	APP	84.95 mi
BISMARCK	ND	K50IX	50	TX	CP	86.02 mi
LOWRY	SD	K56AX	56	TX	LIC	68.53 mi
LOWRY	SD	K56AX	56	TA	-	66.13 mi
IPSWICH	SD	K59BL	59	TX	LIC	35.27 mi
LOWRY	SD	K62AV	62	TX	LIC	68.53 mi
LOWRY	SD	K62AV	62	TA	-	66.13 mi
BISMARCK	ND	K64GN	64	TX	CP	78.03 mi
LOWRY	SD	K68BM	68	TX	LIC	68.53 mi
LOWRY	SD	K68BM	68	TA	-	66.13 mi

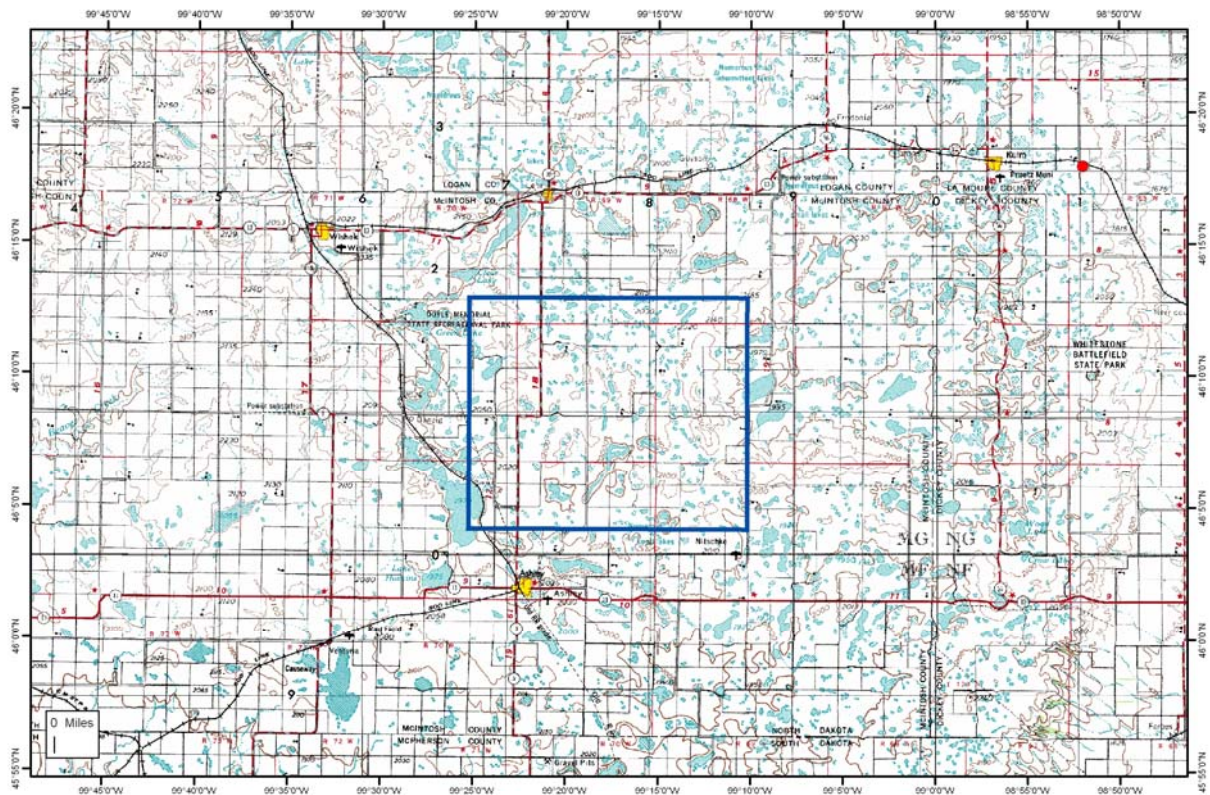
TV –Normal Broadcast Station  
 DS-Digital Service Television, Temporary Operation, STA Operation  
 DT-Digital Television Broadcast Station  
 DR- Indicates Station has Applied for FCC Rule Making  
 DN-New Digital Application  
 GRA-Indicates Rule Making was granted by FCC  
 DC-Change Request to Digital from Analog  
 GRANT-Rule Making Granted  
 LP-Low Power Television Broadcast Station  
 TX-Translator Television Broadcast Station  
 LIC – Licensed and operational station  
 CP – License approved construction permit granted  
 MOD-Modification Requested  
 APP – License application, not yet operational  
 STA – Special transmit authorization, usually granted by FCC for temporary operation  
 CA – Class A Television, Low-power  
 LD - Digital Low power  
 TA – Vacant channel

The most likely TV stations that will produce off-air coverage to the McIntosh County area will be those stations at a distance of 40 miles or less. The stations within 40 miles are listed in Table 2 below. There are only 4 entries in Table 2, representing 2 individual operational TV Stations. The station in Ellendale is a full power station and the station located in Ipswich is a low power station with limited range and limited programming.

The off-air television available to the local communities is considered very limited since there are only two operational TV stations servicing the area. Therefore, off-air TV in the area must be supplemented with other means of TV reception of programming to a large portion of the residents in the area. It is expected that the off-air television stations available in the area are not the only source relied on by the local residents. It is likely that TV Cable service, where available, and/or direct satellite broadcast (DSB) TV service provides TV reception to the residents in the surrounding communities. These alternative TV services will be unaffected by the presence of the wind turbine facility and can provide TV programming to those area residents who do experience degraded off-air TV service after the wind turbines are installed and are operational.

**Table 2 Off-Air TV Channels within 40 Miles of the Proposed Energy Project**

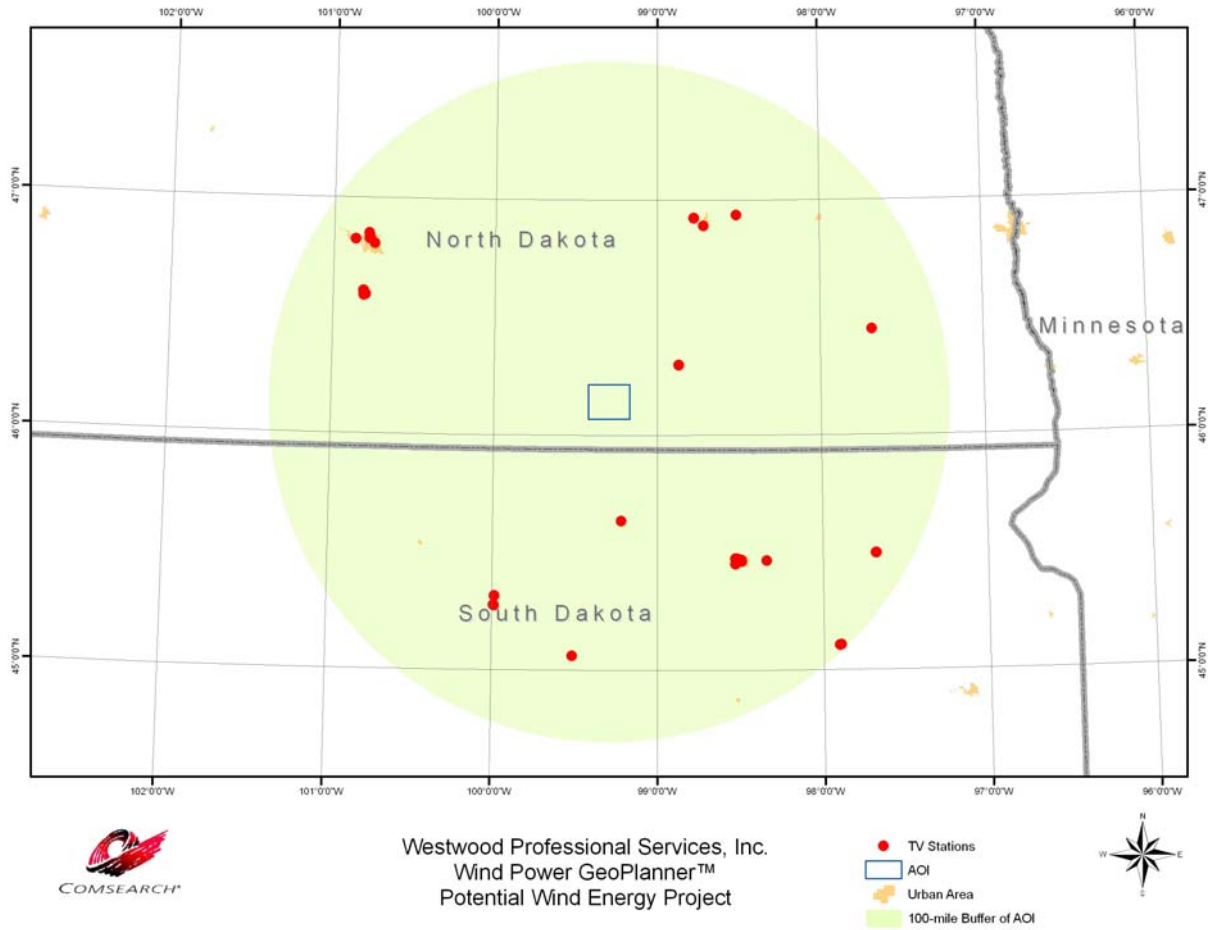
Location	State	Call Sign	Channel	Service	Status	Distance
ELLENDALE	ND	KJRE	19	TV	LIC	23.24 mi
ELLENDALE	ND	KJRE	20	DS	STA	23.24 mi
ELLENDALE	ND	KJRE	20	DT	LIC	23.24 mi
IPSWICH	SD	K59BL	59	TX	LIC	35.27 mi



Westwood Professional Services, Inc.  
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 Potential Wind Energy Project



**Figure 1 Proposed Wind Farm Project Boundaries and Local Communities**



**Figure 2 TV Stations within 100 Miles of the Proposed Wind Farm Project**



**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Telecommunications and**  
**Information Administration**  
Washington, D.C. 20230

JAN 7 2009

Mr. Kurt Oliver  
COMSEARCH  
Director, Field Services  
19700 Janelia Farms Blvd.  
Ashburn, VA 21147

Re: Potential Wind Energy Project, in McIntosh County, ND

Dear Mr. Oliver:

In response to your request on November 11, 2008, the National Telecommunications and Information Administration provided to the federal agencies represented in the Interdepartment Radio Advisory Committee (IRAC) the plans for the Potential Wind Energy Project, in McIntosh County, North Dakota.

After a 45 day period of review, the agencies have not identified any concerns regarding blockage of their radio frequency transmissions.

While the IRAC agencies did not identify any concerns regarding radio frequency blockage, this does not eliminate the need for the wind energy facilities to meet any other requirements specified by law related to these agencies. For example, this review by the IRAC does not eliminate any need that may exist to coordinate with the Federal Aviation Administration concerning flight obstruction.

Thank you for the opportunity to review these proposals.

Sincerely,

Edward M. Davison  
Deputy Associate Administrator  
Office of Spectrum Management



19700 Janelia Farm Blvd  
Ashburn, VA 20147  
703-726-5500

November 11, 2008

Mr. Ed Davison  
U. S. Department of Commerce  
1401 Constitution Avenue N.W.  
Washington DC 20230

**RE: Notification of the Potential Wind Energy Project in McIntosh County, North Dakota**

Dear Mr. Davison:

This letter and its attachments will serve as notification to the government that a confidential project developer plans to install a Wind Energy Facility in McIntosh County, North Dakota. The installation will be called Potential Wind Energy Project.

Enclosed are maps and tables that describe the location of the project and the configuration of the wind turbines.

- Table 1 is a list of the project boundaries.
- Figure 1 is a map of the general area showing the outline of the wind energy project boundaries in North Dakota.
- Figure 2 is a local map of the wind energy facility boundaries.

The dimensions of the Wind turbines to be installed at this facility are:

- Turbine Hub Heights AGL: 100 meters
- Turbine Blade Diameter: 100 meters
- Blade Tip Height AGL: 150 meters

If you have any questions with regard to this notification, please call Kurt Oliver at (703) 726-5675 or me at (703) 726-5860.

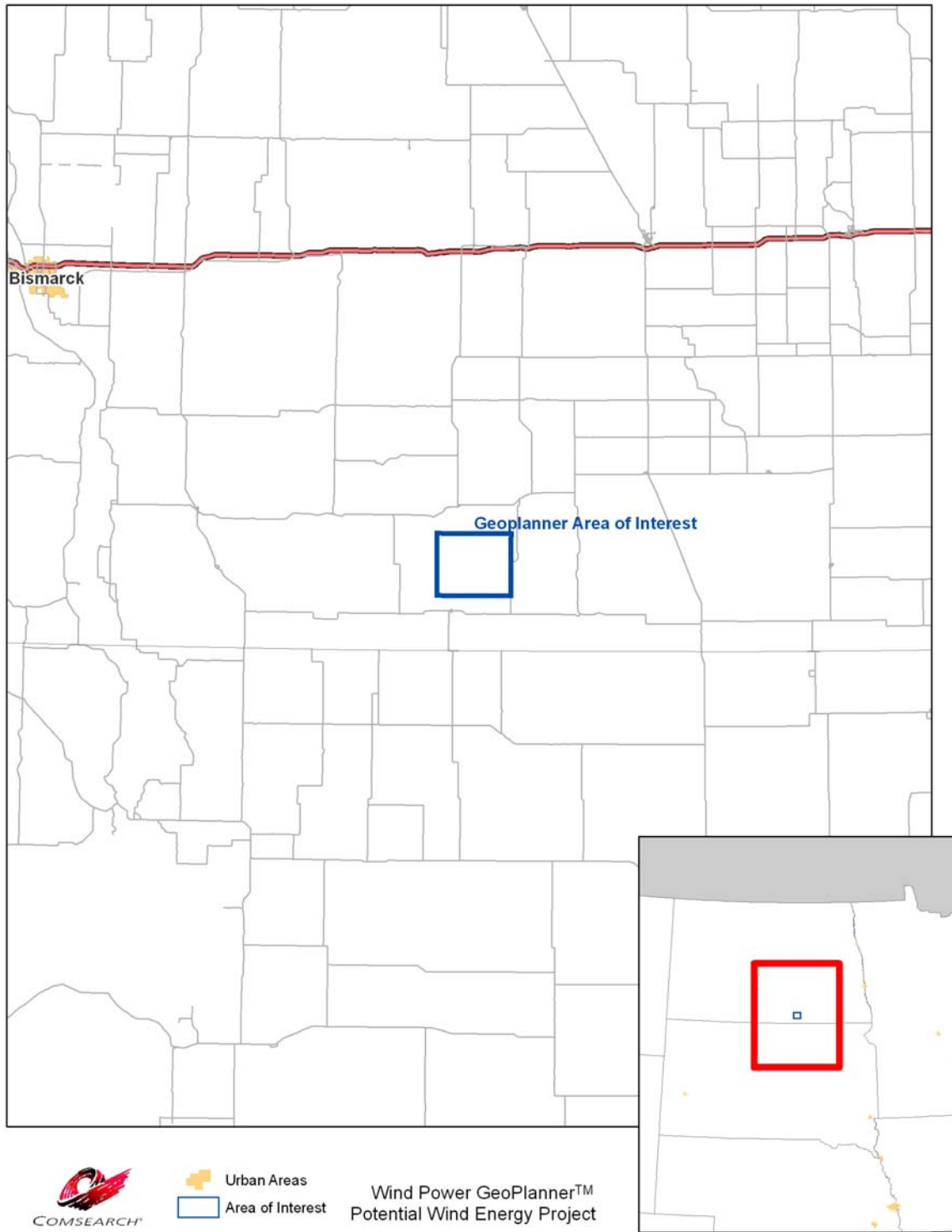
Sincerely,  
**COMSEARCH**

A handwritten signature in black ink, appearing to read "Lester E. Polisky".

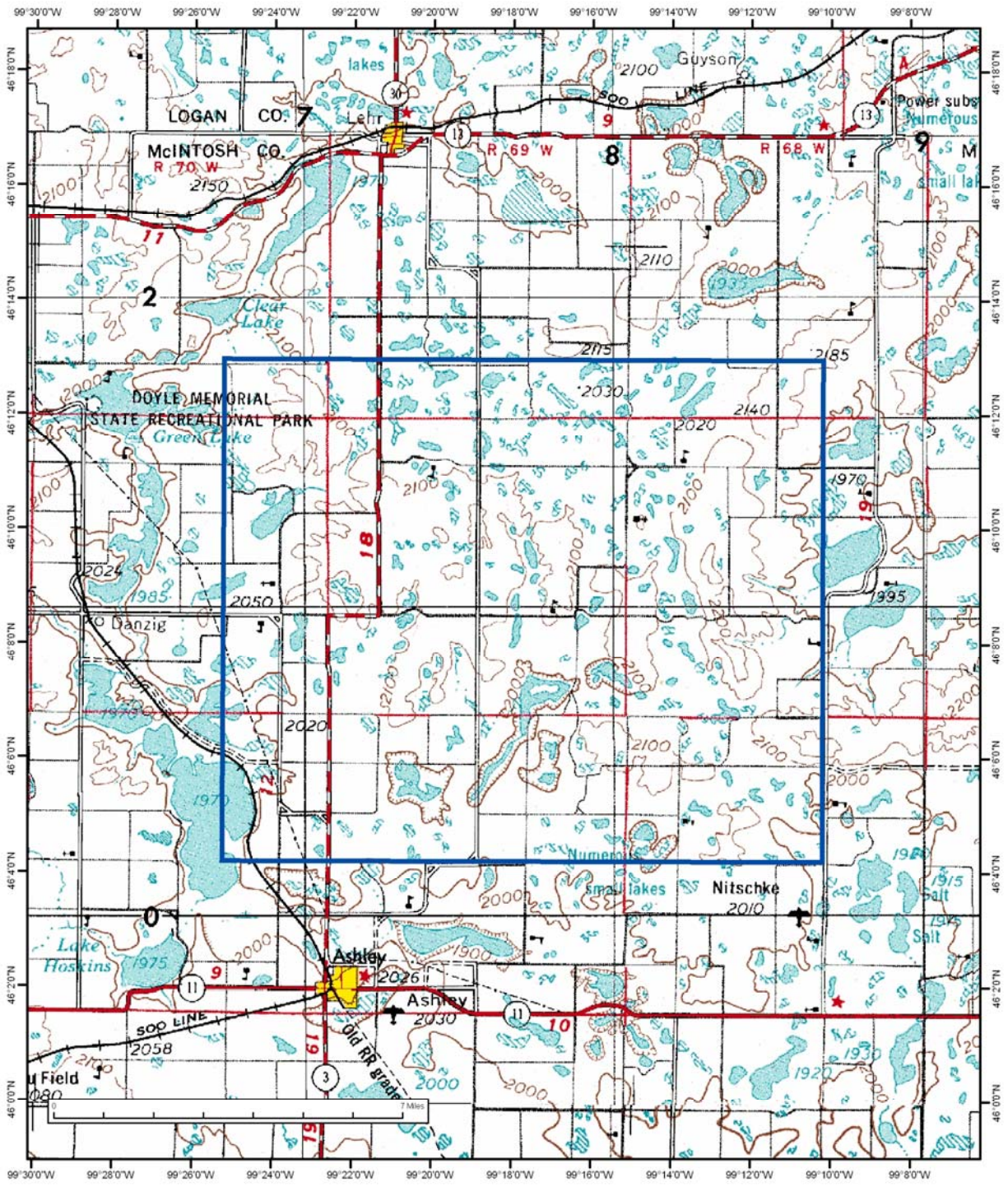
Lester E. Polisky  
Senior Principal Engineer  
Field Services Department  
Attachments

**Table 1 - Corner Coordinates for Potential Wind Energy Project in NAD 83**

	Latitude	Longitude
South East	46.070000 N	99.170000 W
South West	46.070000 N	99.421000 W
North West	46.216000 N	99.421000 W
North East	46.216000 N	99.170000 W



**Figure 1 General Area of the Potential Wind Energy Project**



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Potential Wind Energy Project

Area of Interest



Figure 2 Local Area of Potential Wind Energy Project