

FORT BELKNAP INDIAN COMMUNITY

**Department of Energy
Office of Energy Efficiency & Renewable Energy
Tribal Energy Program
FY-2007 Program Review**

**Denver, CO
November 7, 2007**



FORT BELKNAP INDIAN COMMUNITY

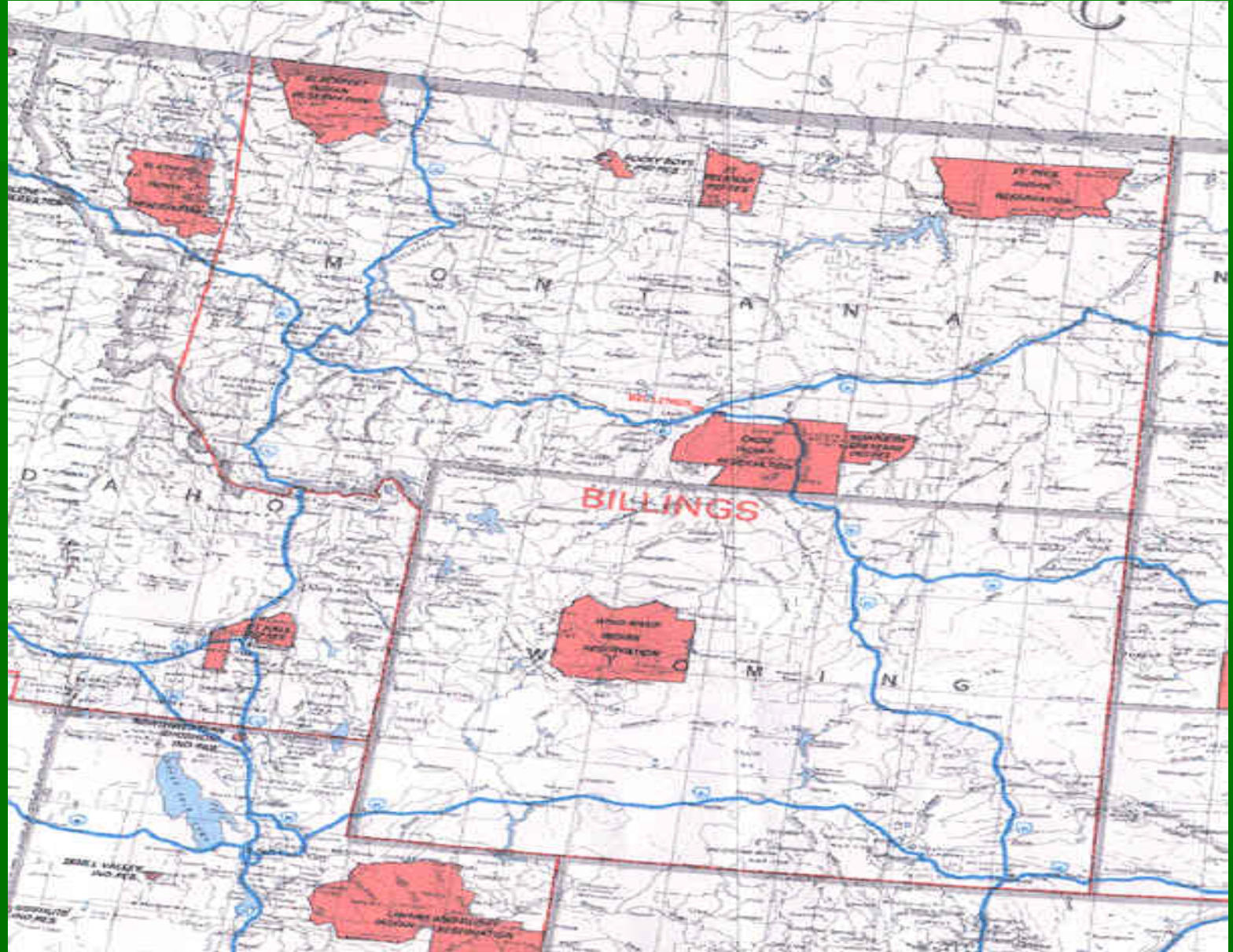
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FORT BELKNAP INDIAN COMMUNITY

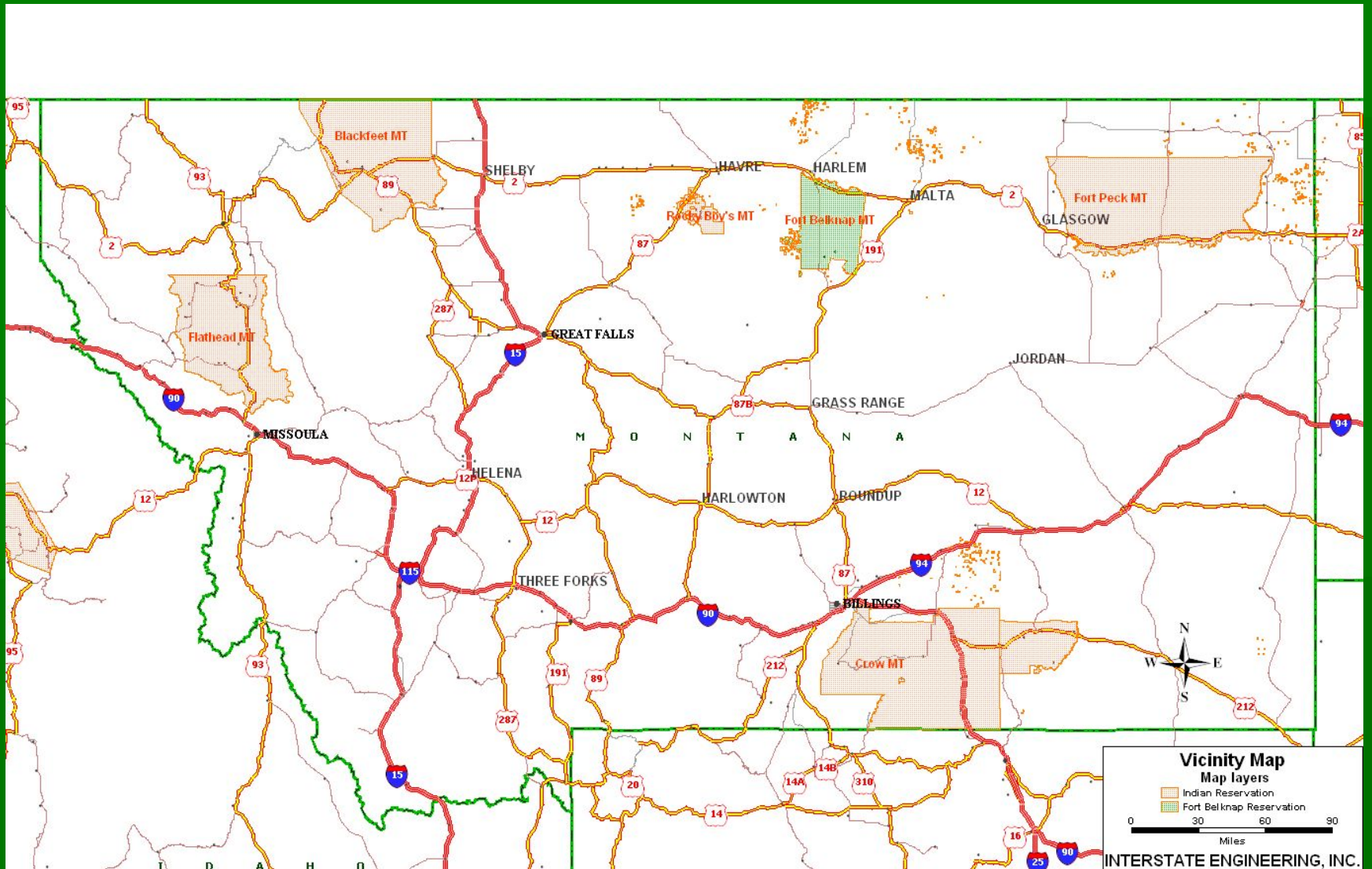


Established in 1869, the Fort Belknap Reservation is the home to two distinct Northern Nations, the Gros Ventre and the Assiniboine tribes. The reservation is located in north central Montana about 36 miles from the Canadian border. Fort Belknap was established in 1869 near the present town of Chinook, Montana. The new fort served as a trading post and became the government agency for the Gros Ventre and Assiniboine Indians living in the area. On May 1, 1888, a congressional act set aside the land for the Fort Belknap Reservation. Later that year, the agency moved from Chinook to its present location five miles east of Harlem, on the northwest corner of the reservation.

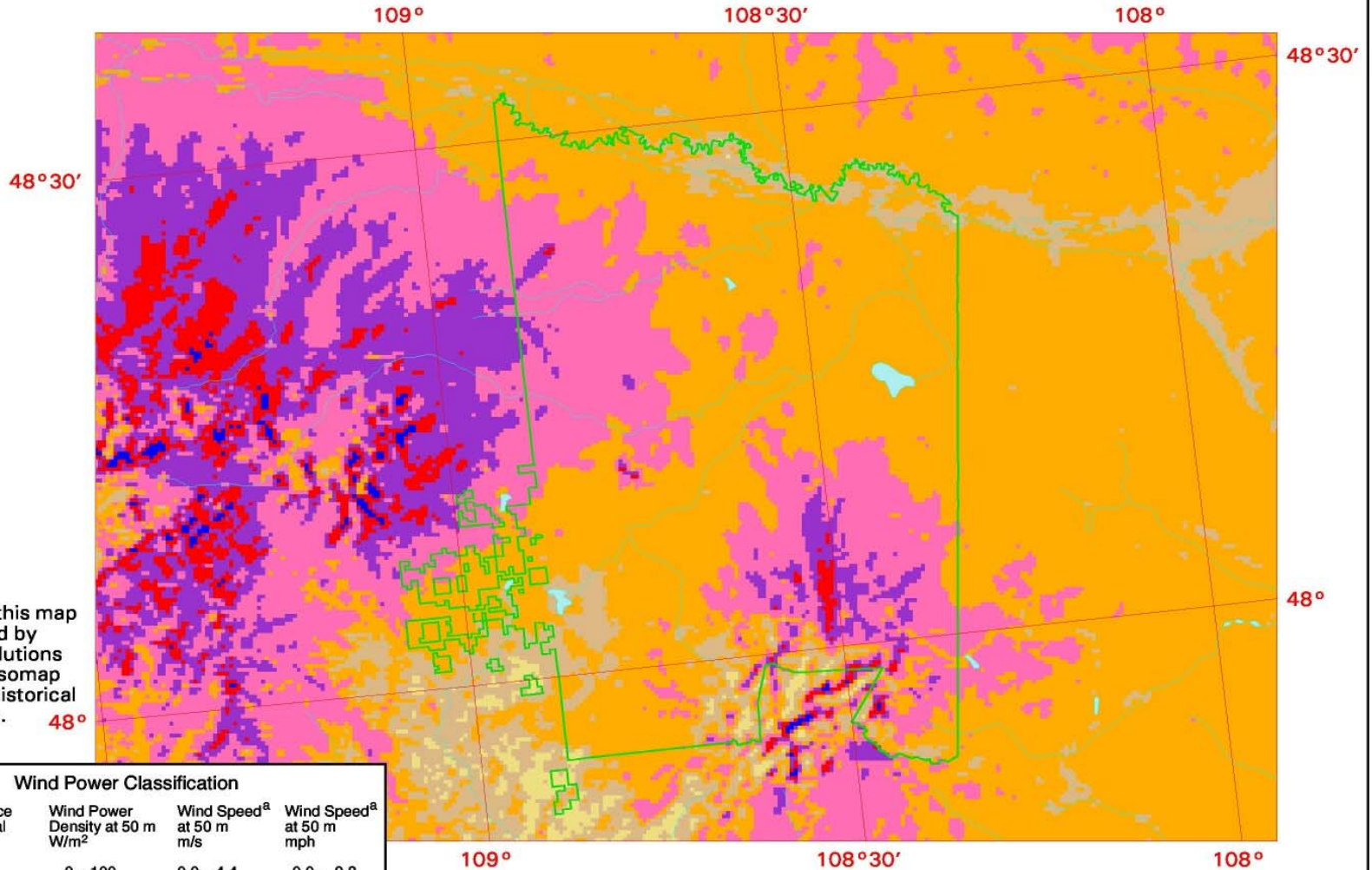
LOCATION



LOCATION



Fort Belknap Reservation - Wind Power Resource Data



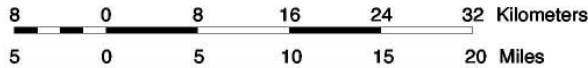
The data for this map was produced by TrueWind Solutions using the Mesomap system and historical weather data.

Wind Power Classification

| Wind Power Class | Resource Potential | Wind Power Density at 50 m W/m ² | Wind Speed ^a at 50 m m/s | Wind Speed ^a at 50 m mph |
|------------------|--------------------|---|-------------------------------------|-------------------------------------|
| 1 | Poor | 0 - 100 | 0.0 - 4.4 | 0.0 - 9.8 |
| 1 | Poor | 100 - 200 | 4.4 - 5.6 | 9.8 - 12.5 |
| 2 | Marginal | 200 - 300 | 5.6 - 6.4 | 12.5 - 14.3 |
| 3 | Fair | 300 - 400 | 6.4 - 7.0 | 14.3 - 15.7 |
| 4 | Good | 400 - 500 | 7.0 - 7.5 | 15.7 - 16.8 |
| 5 | Excellent | 500 - 600 | 7.5 - 8.0 | 16.8 - 17.9 |
| 6 | Outstanding | 600 - 800 | 8.0 - 8.8 | 17.9 - 19.7 |
| 7 | Superb | > 800 | > 8.8 | > 19.7 |

^aWind speeds are based on a Weibull k value of 2.0

**DRAFT
NOT FOR PUBLICATION**



U.S. Department of Energy
National Renewable Energy Laboratory



19-JAN-2002 1.1.19

Fort Belknap Indian Reservation

The Fort Belknap Indian Reservation is located in north central Montana near the town of Harlem. Its northern border runs along the Milk River generally north of US Highway 2 for a distance of about 32 miles. State Highway 66 bisects the reservation on the west side from the Blaine County / Phillips County line (the south border of the reservation) north to US Highway 2. The reservation is approximately 28 miles wide in the east/west direction and approximately 37 miles long in the north/south direction. The total land area of the reservation is approximately 1,011 square miles. Most of the reservation is located in Blaine County, while the eastern most five miles are located in Phillips County.

Project Overview

Recognizing that Montana ranks fifth among all states in wind energy potential the Applicant has chosen to investigate the opportunities for wind energy development on the Reservation. Previously, on November 6, 2002, the Applicant installed a 20 meter meteorological tower in the northwest portion of the Reservation. That installation was accomplished with equipment on loan through the National Renewable Energy Laboratory (“NREL”) Equipment Loan Program and with advice from the NREL staff.

Project Overview

Contracted with Distributed Generation Systems, Inc. (“Disgen”) of Lakewood, Colorado to assist in the preparation of the DOE application and to conduct the Study in cooperation with the FBICC’s staff.

Install a new 50 meter meteorological tower in the northwest portion of the reservation, move the existing 20 meter meteorological equipment to a location near an elementary school in the community of Lodgepole, in the southern portion of the reservation and to install meteorological equipment on a communications tower near Route 66 in the center of the Reservation.

Project Participants

- Fort Belknap Indian Community Council
- FBIC Transportation Planning Department
- FBIC EPA
- Disgen Native American Programs and Resources (Cost Sharing Partner)
- Meteorologist Ed McCarthy

Objectives

The Study's objective is to fully evaluate the Reservation's potential for wind energy development both for use on Reservation and for export off Reservation. In addition, the FBICC's seeks to evaluate the potential for wind/electric water pumping and modern wind/mechanical water pumping systems for remote areas of the reservation and for wind/hybrid systems that may be used on Reservation in ways that may assist the Applicant in managing its energy costs.

Fort Belknap Indian Community Wind Development Plan

Goals & Objectives

Updated: January/2006

| Short-Term Present - 1yr. January/01 to Jan/2002 | Mid-Range 1 yr - 3yr. January/02 to Jan/2005 | Long-Range 3 yr – 10 yr. January/05 to Feb/2015 | Notes: |
|---|--|--|--|
| Letter submitted to Tony Jimenez, NREL, Jan/01 regarding Data Collection. | | | Wind Technology Project: Research Anemometer Tower for data collection. |
| February 6, 2001 Marty Wilde, Wilde Coyote Engineering, presentation to Tribal Council, regarding Wind Energy and the data collection phase, on the same day we erected the data collector at a location south of Hays. | Submit for: Announcement Number DE-PS36-04GO94003, Entitled “Renewable Energy Development on Tribal Lands” Award letter dated January 27, 2006 | | Data will be collected at this site for a minimum period of one year. The monitoring site is located about 2 miles southwest of Hays, Mt at an elevation of 1180 m. (N 47.967°, W 108.713°). Instrumentation consisted of an NRG Wind Explorer system including cup anemometer, wind vane and data logger. The instruments were mounted on a 20-meter (66-foot) tilt-up tubular tower. The data consists of 10-minute average wind speed, wind speed standard deviation and wind direction. June/2006 “Kick Off Meeting” held w/Tribal Council. |
| | Re-locate 20 m Anemometer | | The monitoring period ran from 7 February 2001 to 6 November 2002. The annual average wind speed (at 20 meters [66’]) measured at the site is 5.6 m/s (12.4 mph). The annual average measured wind power density is 205 watts/m ² . |
| | Anemometer Tower relocated with the assistance of John Walden, National Center for Appropriate Technology. | | New site will be on the Northwest side of the reservation where wind data indicates a good area, and closer to larger transmission line. |
| | | Research Wind Development curriculum for Tribal College Course | Received info from: Timlynn Babitsky, Director, North American Rural Futures Institute MSU-Northern Havre, Mt |

| | | | |
|--|--|---|--|
| | | Introduce a Wind Development curriculum at the Fort Belknap Tribal College | Courses will be in the Technical Side & Maintenance Side. |
| | | Feasibility study: how can wind development & proposed ethanol refinery complement each other. | |
| | | Feasibility study: how can wind development & existing Carbon Off Sett Program complement each other. | |
| | | Re-locate 20 meter met tower to Lodgepole on the Southern part of the Reservation | Set up near Lodgepole Elementry School, and get involved in the Green School Program. |
| | | Survey/Poll Questionnaire | Conduct Poll of the community members as to their interest in Wind Development. |
| | Draft Mission/Purpose Statement For Utilities Commission | Assessment of Mission/Purpose Statement | |
| | Adopt Goals & Objectives For Utilities Commission | Evaluation of Goals & Objectives Utilities Commission | Eventually the Wind Development Program will be turned over to the Utilities Commission. |

Fort Belknaps Energy Future

DRAFT:

Energy Policy demonstrates environmental leadership and provides direct economic and environmental benefits to the Fort Belknap Community.

On-Going Project

Project Status

Accomplishments



2006/12/17



2006/12/18



2006/12/18



2006/12/18



2006/12/18



2006/12/18



2006/12/18



2006/12/18



2006/12/18



2006/12/18



2006/12/19



2006/12/19



2006/12/19



2006/12/19



2006/12/19



2006/12/19



2006/12/19



2006/12/21



2006/12/21



2006/12/21



2006/12/21



2006/12/21



2006/12/21

Accomplishments

- “Kick-off” Meeting Held
 - Met-tower installation
 - Phase I Avian Screening
-

Updated Data

Site Information:

Project: Ft Belknap

Location: Harlem

Elevation: 2526

Sensor on channel 1:

NRG #40 Anem. mph

Height: 164 ft

Serial #: SN:

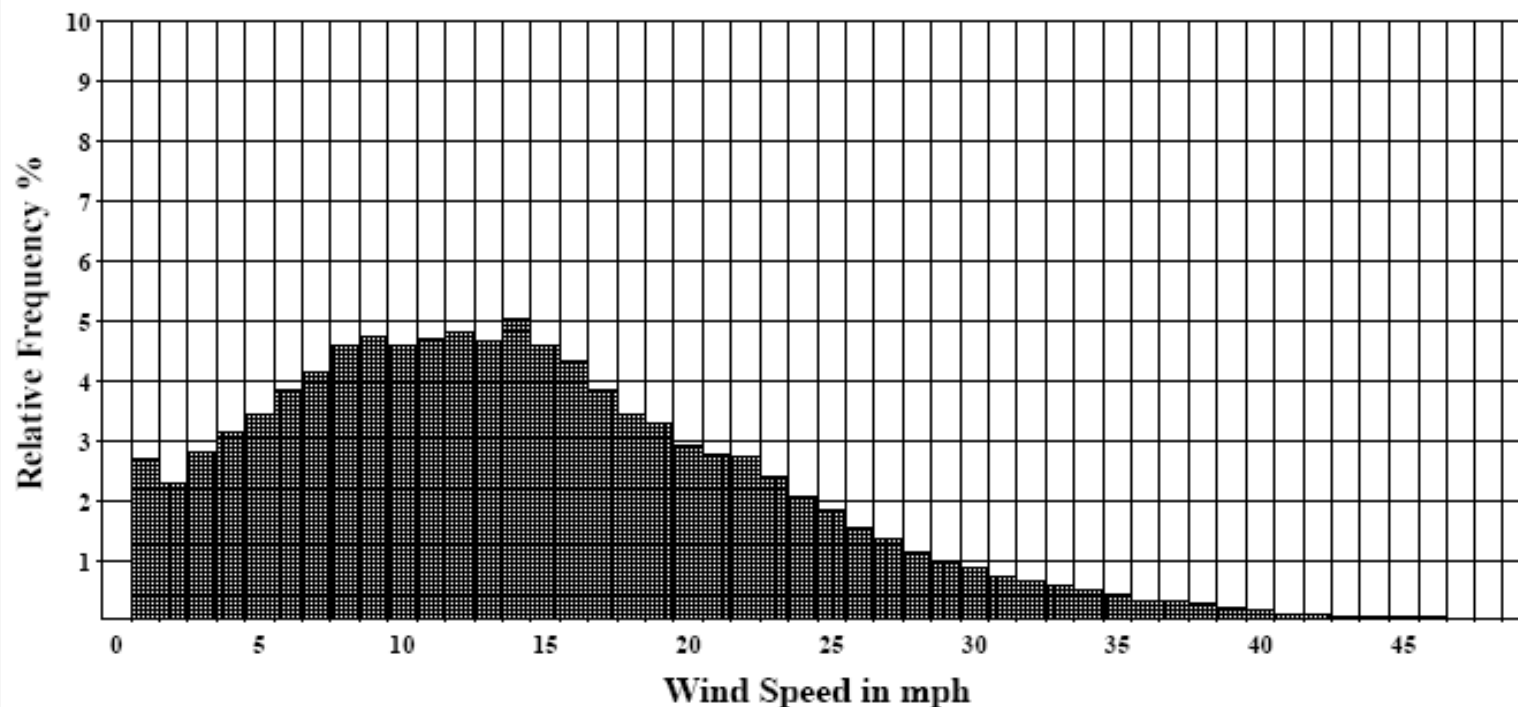
12/19/2006 to 10/17/2007

Frequency Distribution Ch 1

SITE 1135

Fort Belknap

Frequency Distribution



Site Information:

Project: Ft Belknap
 Location: Harlem
 Elevation: 2526

Sensor Information:

1 NRG #40 Anem. mph
 2 NRG #40 Anem. mph
 3 NRG #40 Anem. mph
 4 NRG #40 Anem. mph
 5 NRG #40 Anem. mph
 6 No SCM Installed
 7 #200P Wind Vane
 8 #200P Wind Vane
 9 NRG #110S Temp F
 10 No SCM Installed
 11 No SCM Installed
 12 No SCM Installed

12/19/2006 to 10/17/2007**Summary Report**

SITE 1135

Fort Belknap

| Channel | 1 | 2 | 3 | 4 | 5 | | 7 | 8 | 9 | | | |
|---------------------------|-------------|-------------|-------------|------------|------------|-------|--------|--------|------------|-------|-------|-------|
| Height | 164 ft | 164 ft | 131 ft | 131 ft | 98 ft | ----- | 161 ft | 121 ft | 6 ft | ----- | ----- | ----- |
| Units | mph | mph | mph | mph | mph | ----- | deg | deg | F | ----- | ----- | ----- |
| Interval: with Valid Data | 43439 | 43439 | 43439 | 43439 | 43439 | | 43439 | 43439 | 43439 | | | |
| Average Filtered Data | 14.38 | 14.23 | 14.01 | 13.5 | 13.43 | | 310.13 | 306.53 | 49.5 | | | |
| Average for All Data | 14.38 | 14.23 | 14.01 | 13.5 | 13.43 | | 310.13 | 306.53 | 49.5 | | | |
| Min Interval Average | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | | | | -18.2 | | | |
| Date of Min Interval | 1/20/2007 | 1/20/2007 | 1/20/2007 | 1/20/2007 | 12/20/2006 | | | | 2/14/2007 | | | |
| Time of Min Interval | 9:40:00 AM | 9:30:00 AM | 9:50:00 AM | 7:50:00 AM | 2:50:00 PM | | | | 7:30:00 AM | | | |
| Max Interval Average | 53.6 | 52.7 | 52.5 | 51.3 | 51.5 | | | | 106.2 | | | |
| Date of Max Interval | 1/6/2007 | 1/6/2007 | 1/6/2007 | 3/12/2007 | 3/12/2007 | | | | 7/23/2007 | | | |
| Time of Max Interval | 10:20:00 AM | 10:20:00 AM | 10:20:00 AM | 4:10:00 PM | 4:10:00 PM | | | | 2:50:00 PM | | | |
| Average Interval SD | 1.55 | 1.56 | 1.57 | 1.6 | 1.58 | | 8.25 | 8.85 | 0.14 | | | |
| Min Sample | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | | | | -18.4 | | | |
| Date of Min Sample | 1/20/2007 | 1/20/2007 | 1/20/2007 | 1/20/2007 | 1/20/2007 | | | | 2/14/2007 | | | |
| Time of Min Sample | 5:40:00 PM | 5:40:00 PM | 5:40:00 PM | 5:00:00 PM | 4:50:00 PM | | | | 7:30:00 AM | | | |
| Max Sample | 68.4 | 68.4 | 66.6 | 67.5 | 65 | | | | 106.9 | | | |
| Date of Max Sample | 9/26/2007 | 9/26/2007 | 9/26/2007 | 9/26/2007 | 9/26/2007 | | | | 7/23/2007 | | | |
| Time of Max Sample | 8:10:00 PM | 8:10:00 PM | 8:10:00 PM | 8:10:00 PM | 8:10:00 PM | | | | 2:50:00 PM | | | |
| Average Interval TI | 0.14 | 0.15 | 0.15 | 0.16 | 0.15 | | | | | | | |
| Wind Speed Direction | | | | | | | WNW | WNW | | | | |

Technical or Management Issues

Activities Yet to Be Completed

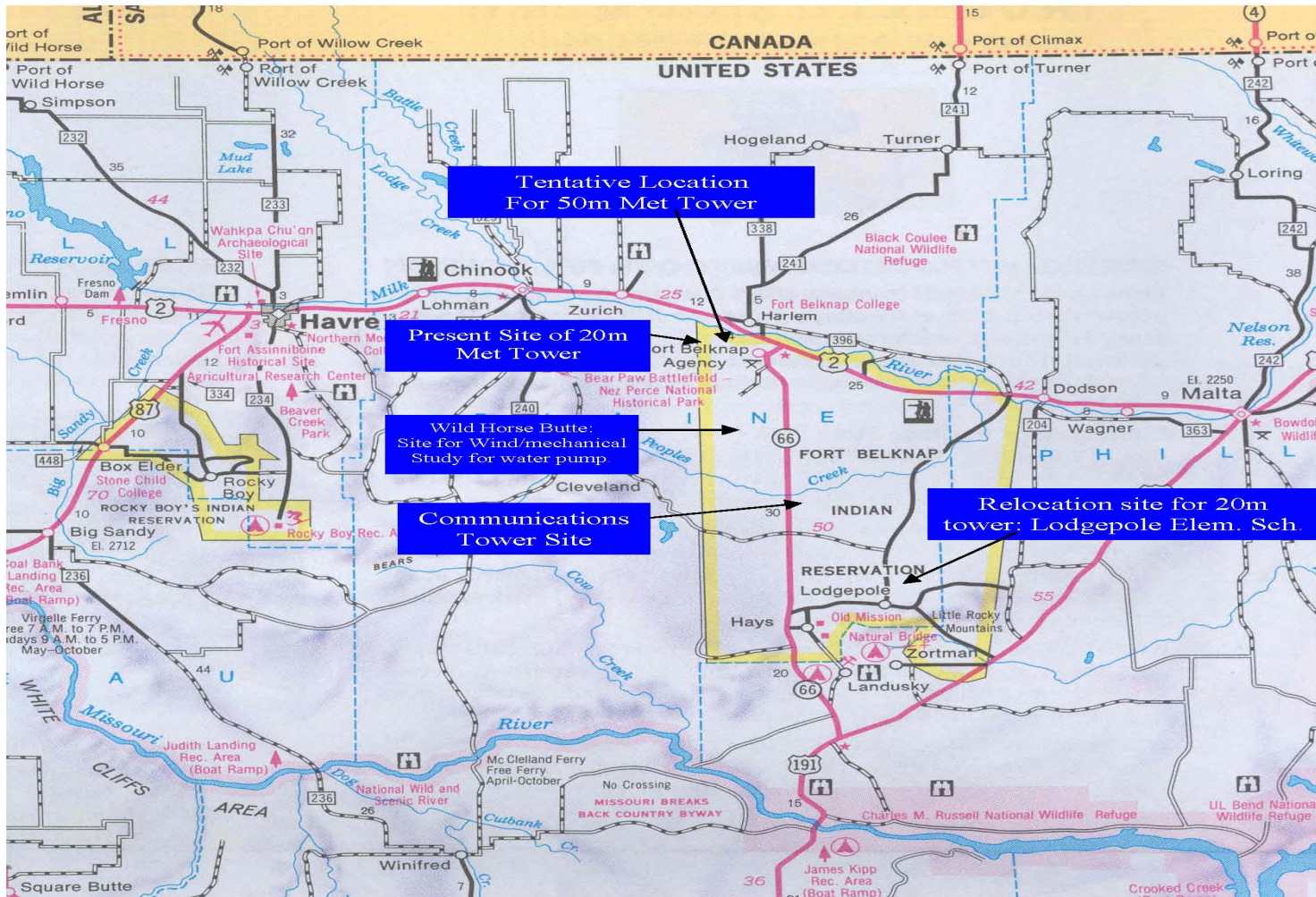
- Phase I Avian Screening
- Permit Process (to be completed)
- Transmission capability review
- Collection of wind data
- Marketing Analysis

Future Plans

- This Study will help determine whether the wind resources at specific sites on the Reservation are capable of being developed economically.
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Future Plans

- Remote water site
For Buffalo Pasture
-





FORT BELKNAP INDIAN COMMUNITY

Questions?

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