Lake Traverse Reservation Wind Farm Siting Project

Wind STEP Program University of Minnesota Morris June 2012

Wind STEP Program

- University of Minnesota Morris WindSTEP
 - Learning and research opportunity
 - Focus of on wind energy project
 - Encourage Native American students to pursue scientific careers
 - Address the need for scientists in the United States
- Who is Wind-STEP?
 - Native American high school students
 - College student mentors and role models
 - College professors
- We are learning
 - Science
 - Energy resources
 - Geographic information systems
 - Public speaking

Wind STEP - Participants

• Pine Ridge

- Alexis Fast Wolf 12th
- Chase Clifford 10th
- Della Bates Graduated
- Upper Sioux
 - Charles Blue 11th
 - Naomi Pigeon 12th
- White Earth
 - Eugene Sommers Graduated
- Rosebud
 - Montanti Bordeaux 11th
- Sisseton Wahpeton
 - Christian Owens 11th
 - Joseph Erdrich 11th
 - Iowa
 - Aydan Wynos 11th
 - Garretson, SD
 - Michelle Carnicle 10th



Wind STEP 2012 Project

- Lake Traverse Reservation
 - Dakota Magic Casino & Resort
 - Dakota Sioux Casino & Hotel
 - Agency Village



Technology

Internet - Research Geographic Information System, ArcGIS - Mapping



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Airspace Regulation

- Airports & Heliports
- Buffers are set according to the length of airport runways
- No construction
 - Within 10,000 feet of a public/military airport runway if its runway is less than 3,200 feet
 - Within 20,000 feet of a public/military airport runway if its runway is longer than 3,200 feet
 - Within 5,000 feet around a heliport
- The Federal Aviation Administration (FAA) is the regulating authority



Highways & Interstates

- Created buffers to:
 - Eliminate effects of shadow flicker
 - Epileptic Seizures
 - Dizziness and distraction
 - Headache
 - Reduce driver distraction\car accidents
- Local municipality regulates the highways and interstates
- ¹/₂ mile buffers
- Local streets not included

Wind turbines effect on roads





Communications

Cellular, TV, Radio

 Regulated by the Federal Communication Commission

Applied 350 foot buffer



- Protecting against
 - Electromagnetic Interference (EMI)
 - creates a frequency in the radio band that is being used
 - Near-Field Effects
 - changes the characteristics of that antenna
 - Diffraction
 - causes a radio wave to be partially blocked, causing signal loss
 - -Reflection
 - radio waves are reflected from a wind turbines surface

Prime Agricultural Soils

- Protect Prime Agricultural Soils
 - Crop productivity
- Map represents top 30%
- Managed locally
 - Soil and Water
 Conservation Districts
- Regulations vary by jurisdiction

Hydric & Engineering Capacity of Soil



Hydric Soils

- Unstable ground to build on
- Hydric soils are water saturated from repeated flooding over time
- Usually regulated by city, town or county



Engineering Capacity

- Soils classified using data obtained from
 - Borings
 - Surface soil conditions
- Data from NRCS

Protected Lands

- Regulating protected lands
 - Agricultural easements
 - Wetland Reserve Program
 - State Parks
 - Other protected lands
- Buffer is 600 feet

- Protect because in land conservation program
- Reduce or eliminate
 impacts
- Lands are regulated by NRCS, states, and municipalities



Northern half of reservation

Southern half of reservation



National Wildlife Refuges & Waterfowl Protection Areas

- U.S. Fish and Wildlife
 Services
- Buffer
 - NWR 10,000 feet
 - WPA 5,000 feet

- Bird & Bat Collisions
 - Turbine
 - Blades
 - Wires
- Invasion of Habitat
 - Nests
 - Homes







Lakes, Steams & Rivers

- Buffers
 - Lake 600 feet
 - Rivers & Stream 750 feet
- Protect wildlife habitats
- Reduce or avoid water pollution
- Generally regulated by the municipality



Wetlands

- Applied 600 foot buffer
- Species protection
- Wetland protection
 - Reduce flooding
 - Trap sediment
 - Water purity
- Regulated by local municipalities
- NWI data used for the study



United States Severe Weather

- Severe weather may damage wind turbines
- Wind turbines are designed to shut down during high winds.
 - Components can be damaged if the wind turbine produces too much energy
- The Green lines represent tornado tracks from 1950-2005
 data from NOAA and NWS



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Regional Severe Weather



Local Severe Weather



Study Composite Considerations

Composite includes

- Proximity to airports
- Wetlands
- Streams, Lakes & Rivers
- Soils
- Roads
- Protected Lands
- Communication

Not Included

- Land ownership
- Proximity to electrical grid
- Sacred sites
- Cultural sites
- Rare, threatened & endangered species
- Etc., etc.

Agency Village





Dakota Sioux Casino & Hotel

Dakota Magic Casino & Resort



Conclusion

- Majority of the land has constraints
- Any siting requires further analysis
- Tribal government siting regulation
 - Buffers
 - Setbacks
 - Excluded areas
- Still potential for utility, community & residential projects

Questions

Thank You!