



What Makes a Successful Wind Project: Environmental Assessment and Permitting



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WINDPOWER 2010
Dallas, TX
Wind Energy 201

Windland USA Project - Project Permitting Assumptions

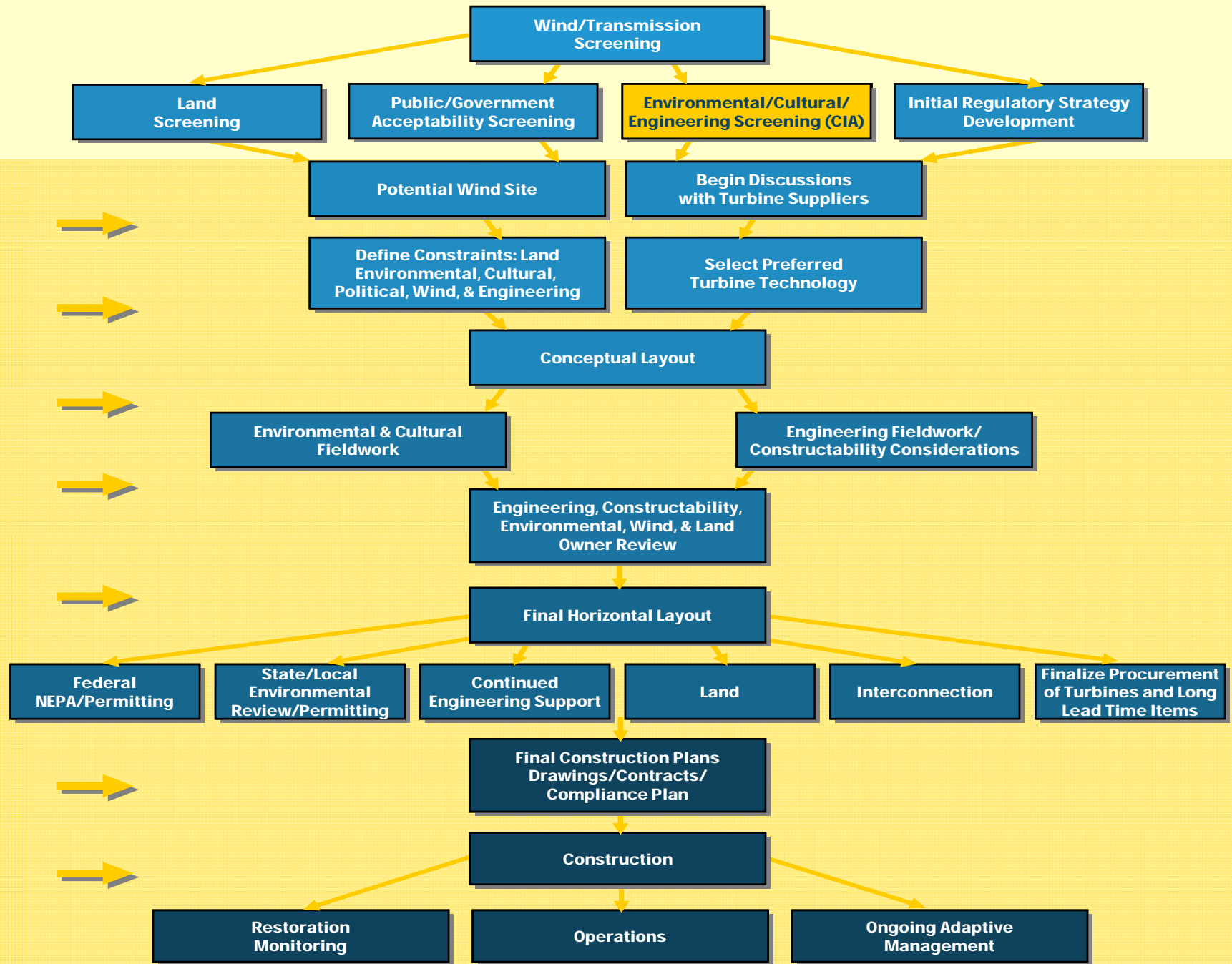
- Several siting studies have been completed (Phase I ESA, fatal flaw analysis)
- There are no known threatened or endangered species in the area (but a T&E study has not been done)
- There is no known opposition to the project (possibly because the project has not been publicly announced)
- The project has the support of the county and has been told a building permit is all that is required
- There are a number of residences on or near the site, but most are project participants



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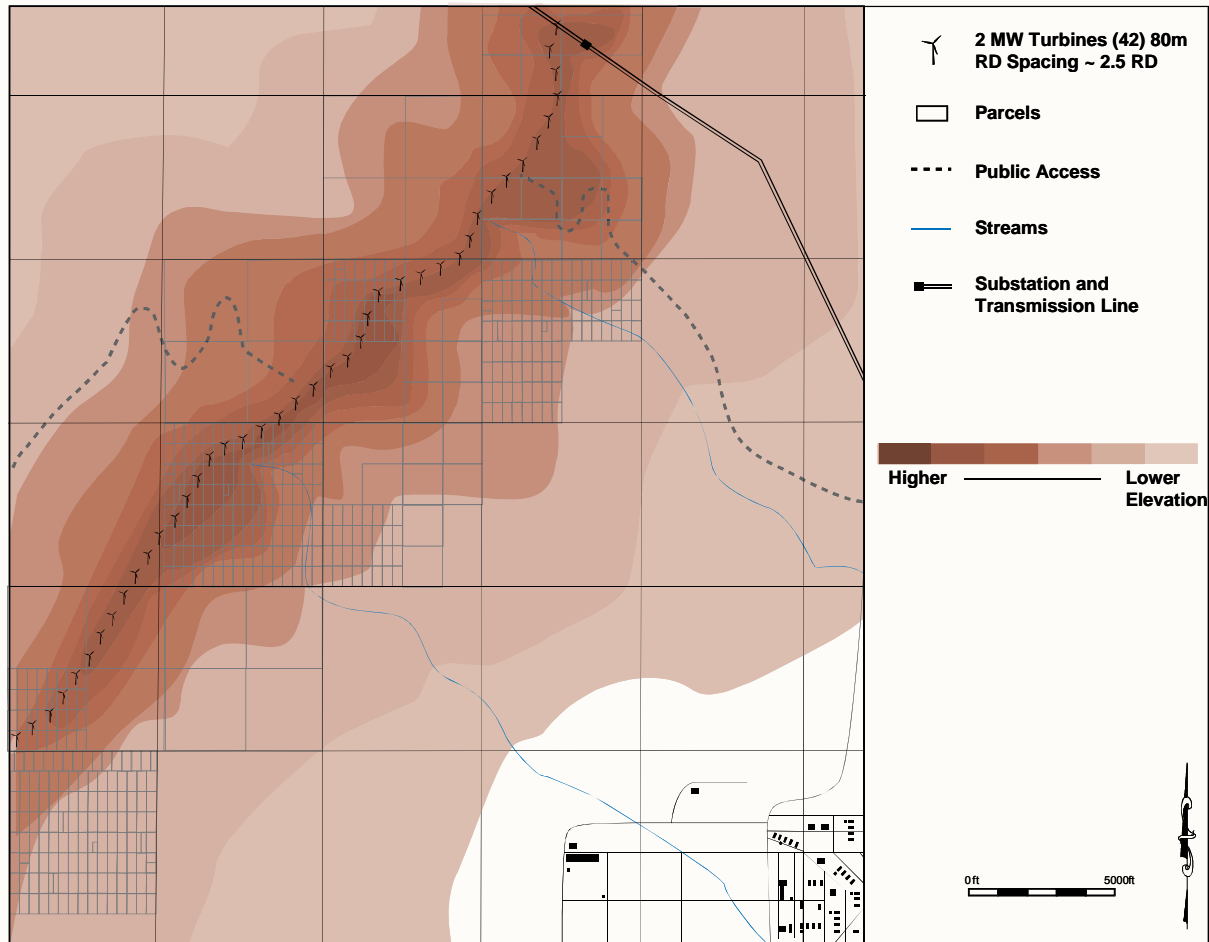
Anatomy of a Wind Project



Public & Governmental Outreach and Involvement



Once you identify a site, begin site specific screening

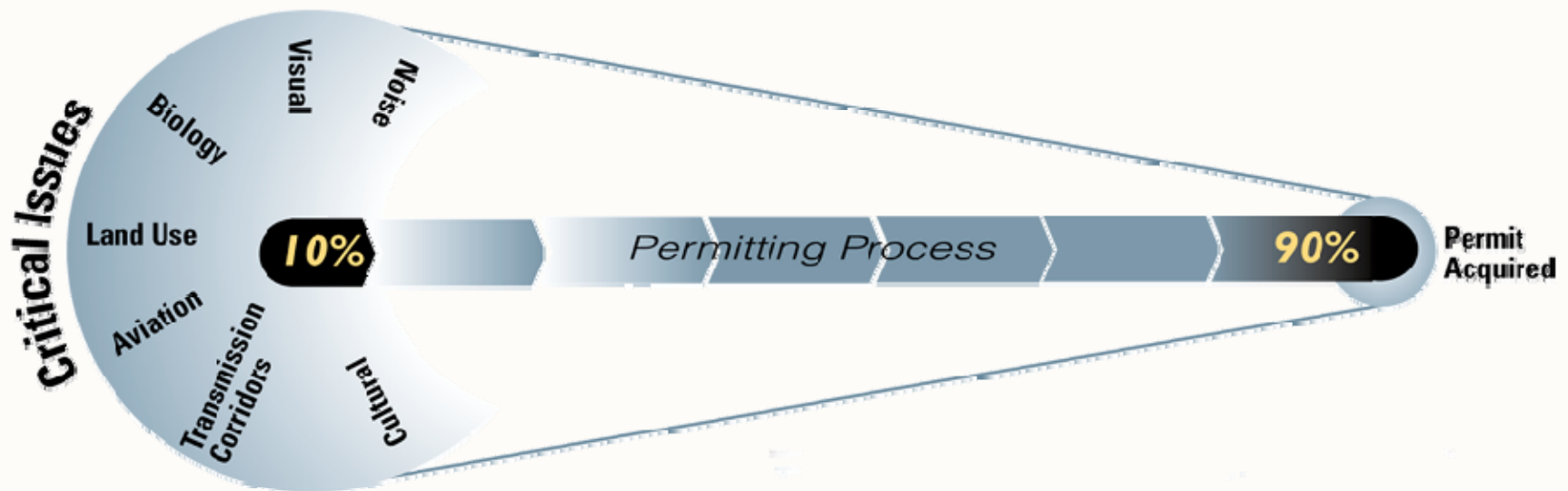


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Critical Issues Analysis – Very Important

- Desk-Top Studies are typically:
 - **First step** of Environmental Permitting
 - **10% or less** of the Overall Permitting Cost



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Main Goals of Critical Issues Analysis

- Also called Fatal Flaw Analysis, Site Characterization Study, etc.
- Critical Issues Analysis (CIA) is a screening study that:
 - Identifies known natural, cultural, and social resources that may affect project feasibility, schedule or cost
 - Identifies potentially applicable permits and permit application requirements
 - Provides recommendations for further study and impact avoidance
- Components include:
 - Desktop studies
 - Available a la carte (Biological, Cultural, Aesthetics, Geotechnical, Telecommunications, Aviation, Land Use and Permitting, etc.)
 - Reconnaissance-level Field Studies
 - Critical Issues Analysis Report
 - Documents key issues that warrant special consideration
 - Provides: Initial permit matrix, recommendations, and schedule

Identifying known protected resources early in the development process allows design of project that minimizes liability and avoids impacts.



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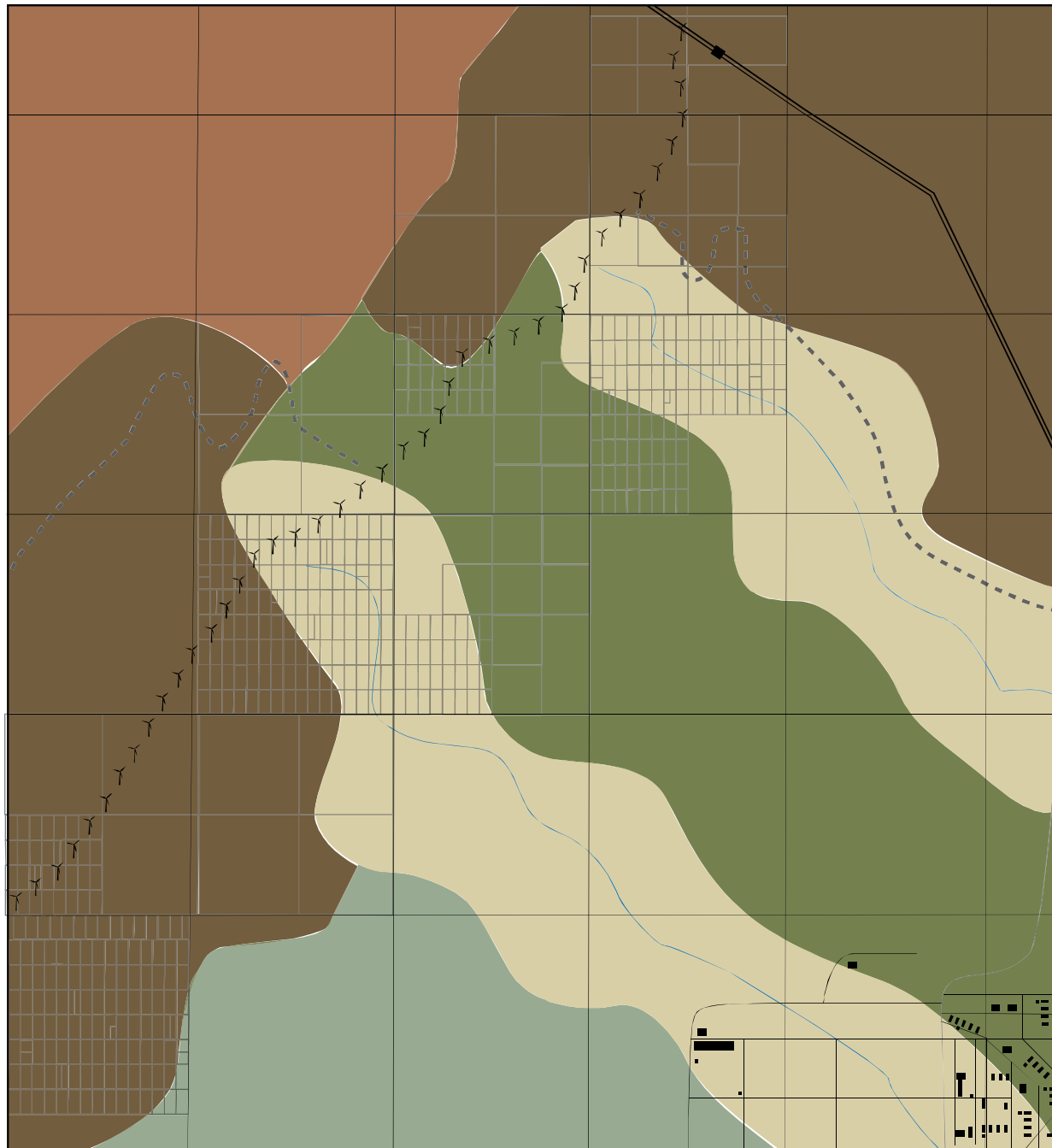
Identify Environmental Constraints – Natural Resources

- Protected by Federal Endangered Species Act, Migratory Bird Treaty Act, Bald and Golden Eagle Protection Act, Section 404 of the Clean Water Act, and state equivalents
 - Threatened and Endangered Species Habitat
 - Wildlife Management Areas
 - Bat Habitat
 - Bald and Golden Eagle Habitat
 - Protected wetlands and water resources



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 **2 MW Turbines (42) 80m RD Spacing ~ 2.5 RD**

 **Parcels**

 **Public Access**

 **Streams**

 **Substation + Transmission Line**

 **Riparian Area**

 **Woodland + Scrub**

 **Grassland**

 **Woodland**

 **Chaparral**

Sample Habitat Map

0ft  5000ft



Identify Environmental Constraints - Cultural

- Protected by National Historic Preservation Act, Archaeological Resources Protection Act, Native American Graves Protection and Repatriation Act, and state equivalents
 - National Register of Historic Places
 - Known Archaeological Sites (subject to confidentiality)
 - State Register of Historic Places

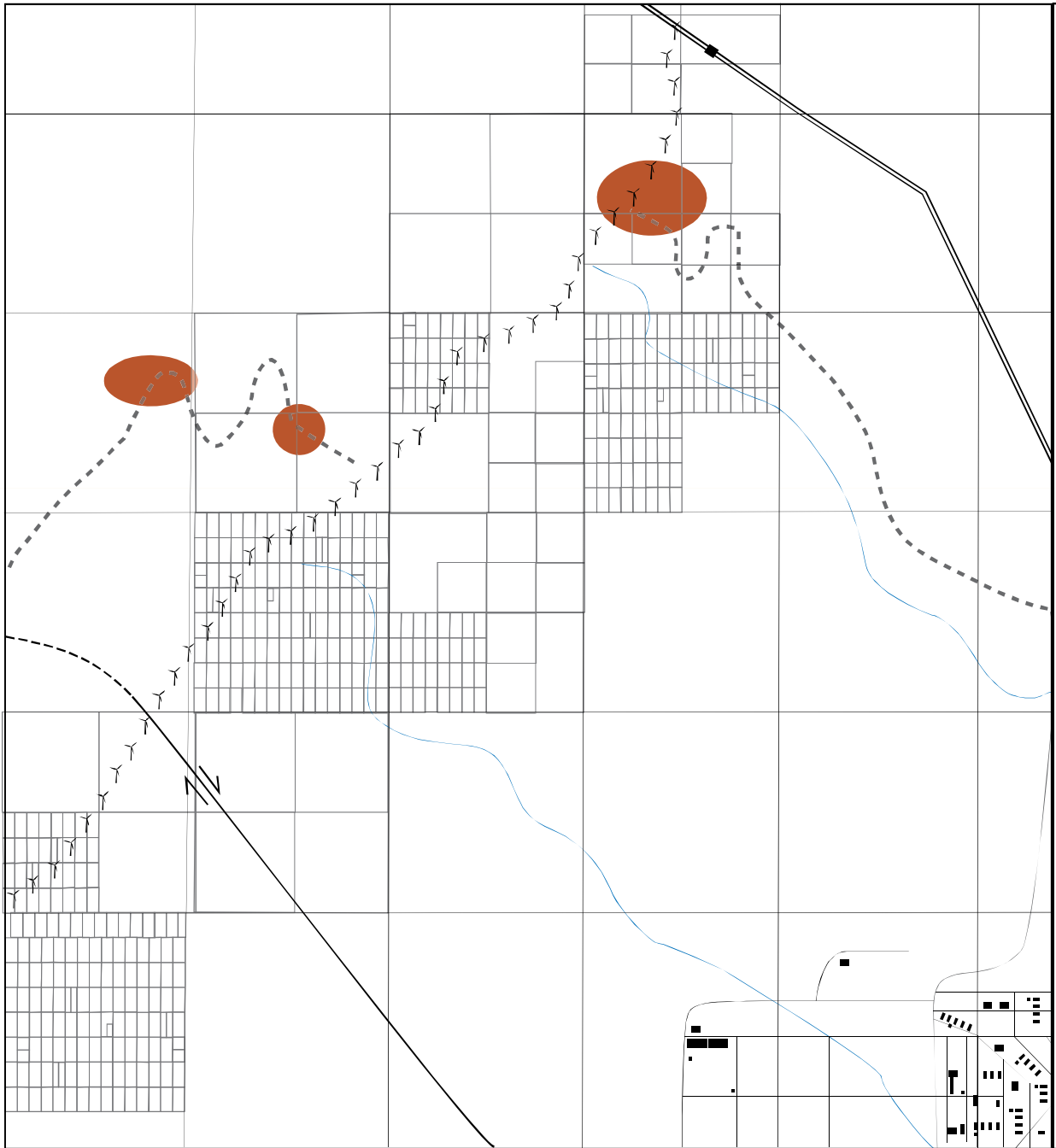
Built in 1892 and listed on the National Register of Historic Places. Affectionately known locally as "Ole Red". It is located across from Dealy Plaza and the "grassy knoll".










Native American Artifacts found in Texas



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-  **2 MW Turbines (42) 80m RD Spacing ~ 2.5 RD**
-  **Parcels**
-  **Public Access**
-  **Streams**
-  **Substation and Transmission Line**
-  **Cultural Impact**
-  **Fault Line**

Sample Cultural Resources Map

0 ft 5000ft




Identify Environmental Constraints - Social

- **Social Resources** – Protected by Federal Aviation Administration Regulations, local ordinances and land use plans
 - Communication facilities (microwave)
 - Military and commercial airspace
 - RADAR (military and civilian)
 - Recreational Areas
 - Residential areas, churches, hospitals, etc



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Initial Regulatory Strategy Development

- Identify **REGULATORY DRIVER(s)** – The permit(s) with the longest timeframe and most supporting documentation for the application
 - Identify all applicable permits, laws, and regulations
 - Identify recommended studies for further analysis

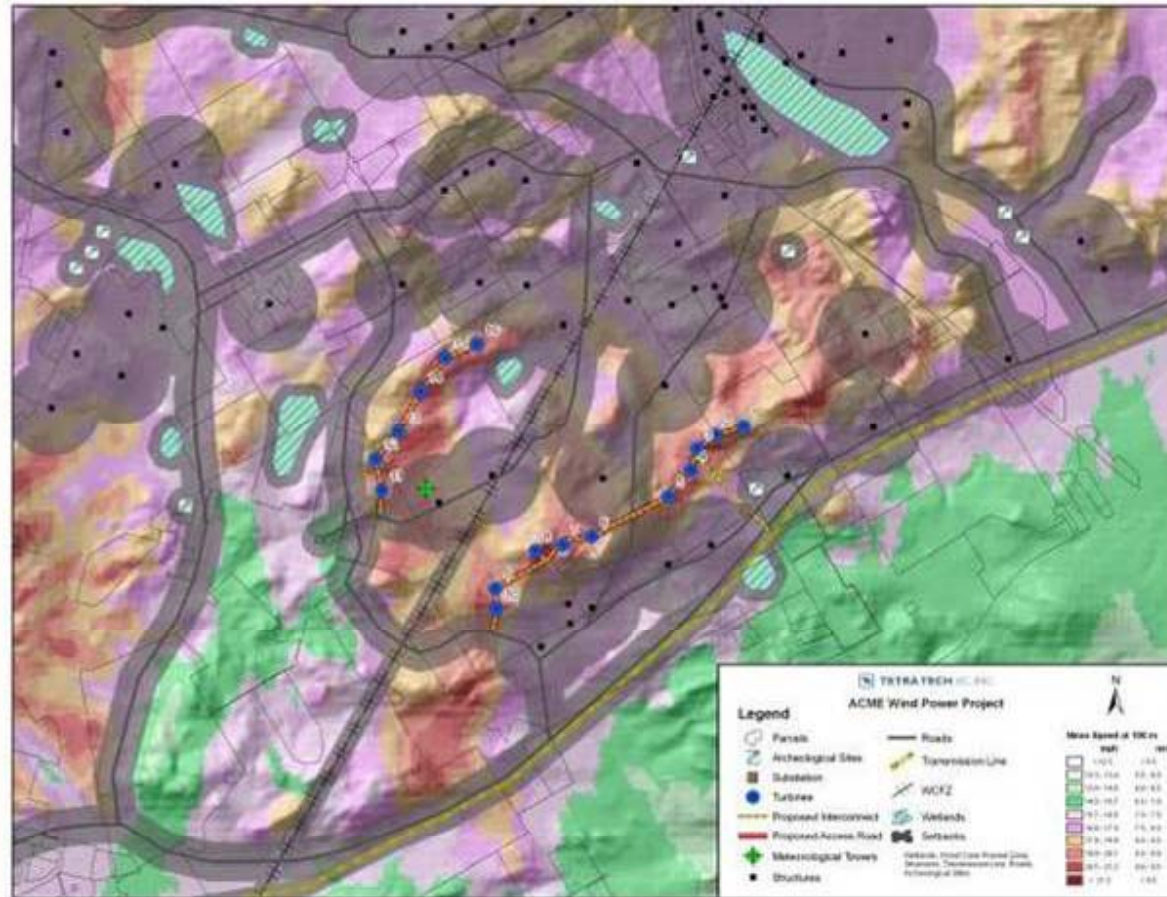
TIP – Identify sensitive resources as early as possible in the development process and avoid impacts wherever possible – impacts can trigger thresholds for expensive, time consuming permitting



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Define Constraints / Conceptual Layout – Example map



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Define Constraints / Conceptual Layout

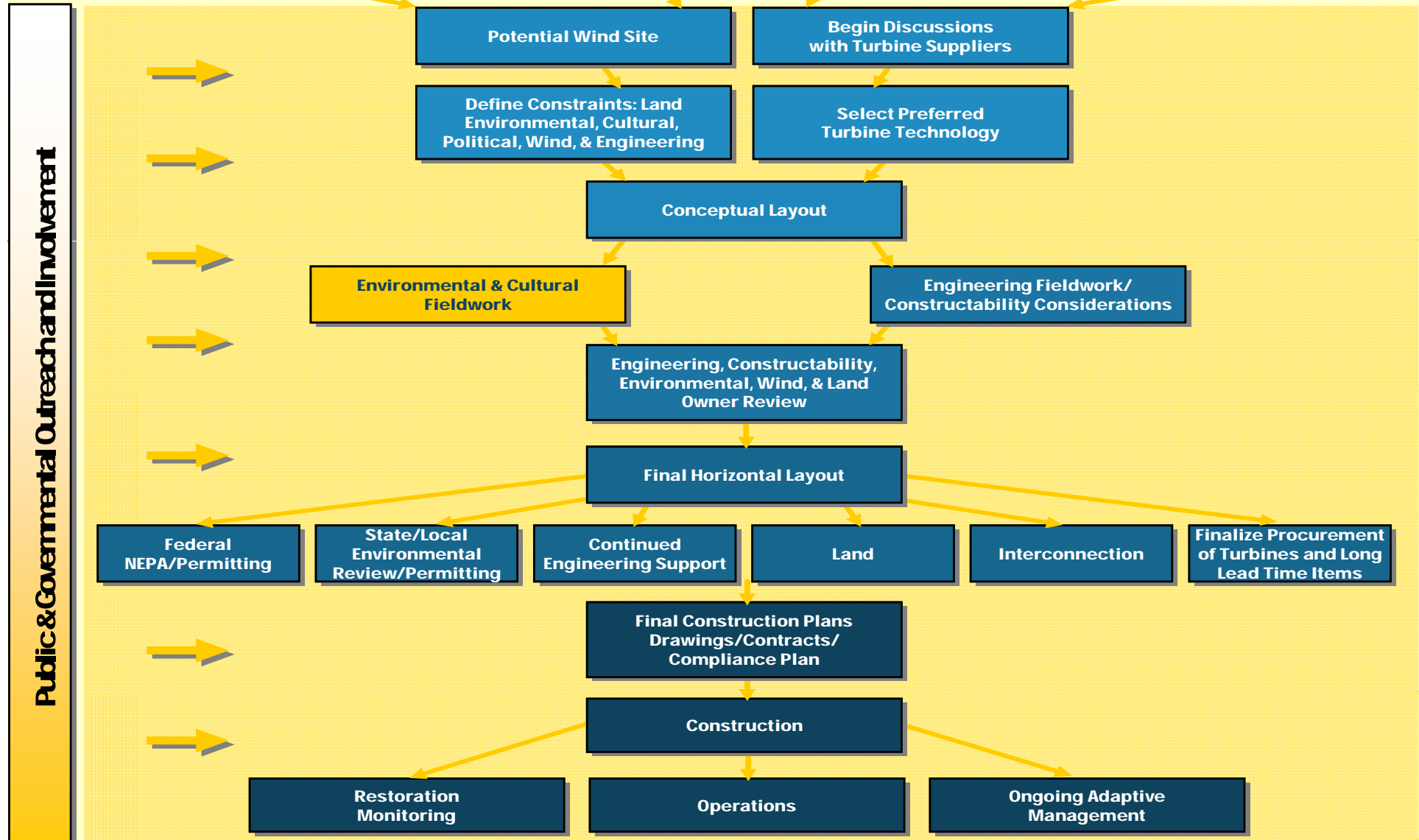
- Revise layout throughout development process as additional information becomes available from further studies and public and agency input
- Final layout should take into consideration environmental constraints, wind resource and other important considerations (engineering, landowner agreements, constructability, etc.)

Design a project that can be built!



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Anatomy of a Wind Project



Example Environmental Studies

- Biological
 - Pre- and Post Construction Avian and Bat Surveys
 - T&E Species Surveys
 - Wetland Determinations & Delineations
- Cultural, Historic and Archeological Resources
 - Literature Reviews
 - Pedestrian Surveys
- Visual Simulations
- Shadow Flicker Analysis
- Noise Assessments
- Soils and Geological Hazards
- Socioeconomic, Land Use, and Recreation
- Transportation



Important to identify the right level of effort for environmental assessment for each project. May not need to conduct all of these studies for every project.



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Environmental Studies for Windland, USA Project

- **T&E study has not been done**
 - U.S. Fish and Wildlife Service and Windland State Wildlife Agency Inquiry Letters/Natural Heritage Database Search
 - Consider field surveys to identify presence of potential habitat
- **Project not yet publicly announced**
 - Consider holding open house, preparing visual simulations
- **County building permit all that is needed**
 - Verify that this is accurate based on estimated impacts
- **Number of residences, but most are project participants**
 - Visual simulations, shadow flicker, and noise baseline assessment and modeling may apply depending on relevant regulations and voluntary community outreach by the developer
- **Other potential studies**
 - Dependent on project specific issues



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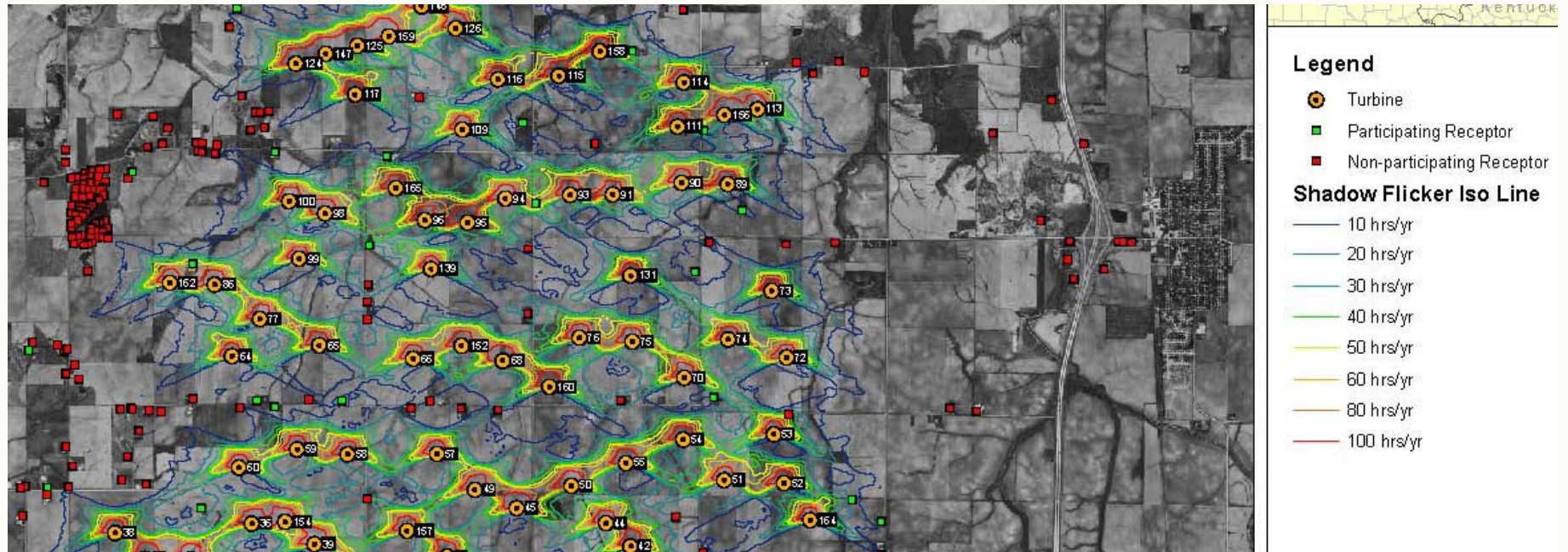
Visual Simulation Example



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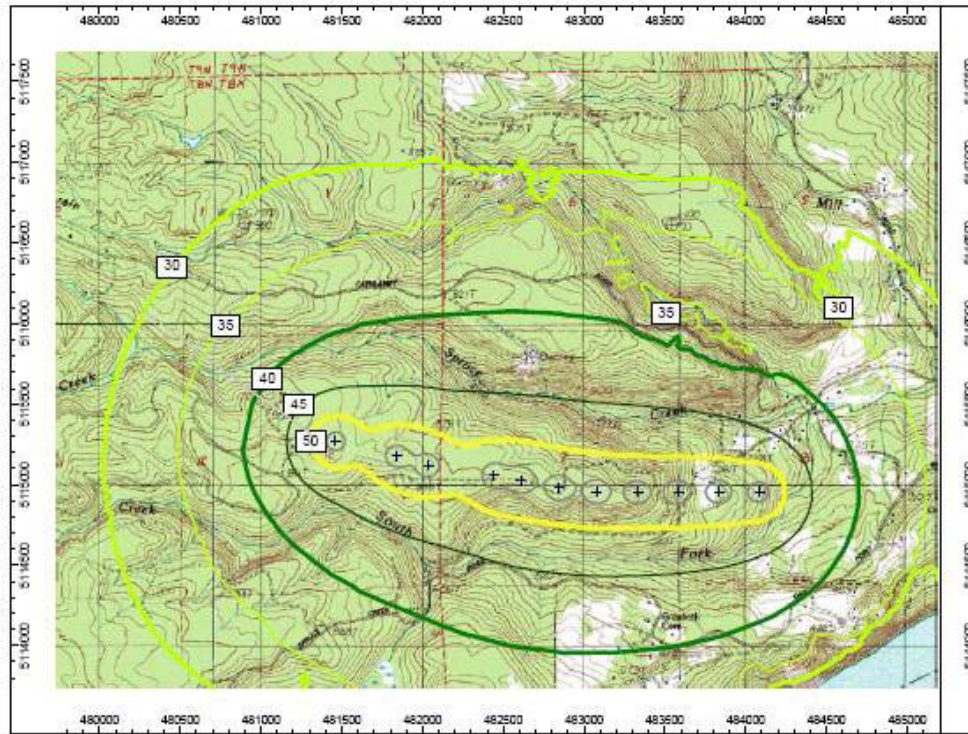
Shadow Flicker Modeling Example



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Sound Contour Modeling Example



http://www.awea.org/pubs/factsheets/Utility_Scale_Wind_Energy_Sound.pdf



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Tips for Environmental Assessment and Permitting

- **Identify** environmental development constraints as early as possible
- **Identify** and plan for applicable permits as early as possible
- **Choose** appropriate level of effort for further environmental assessments
- **Adjust** layout throughout process and more environmental information becomes available
- **Engage** community



Construction of Kodiak Electric Association Pillar Mountain Wind Project

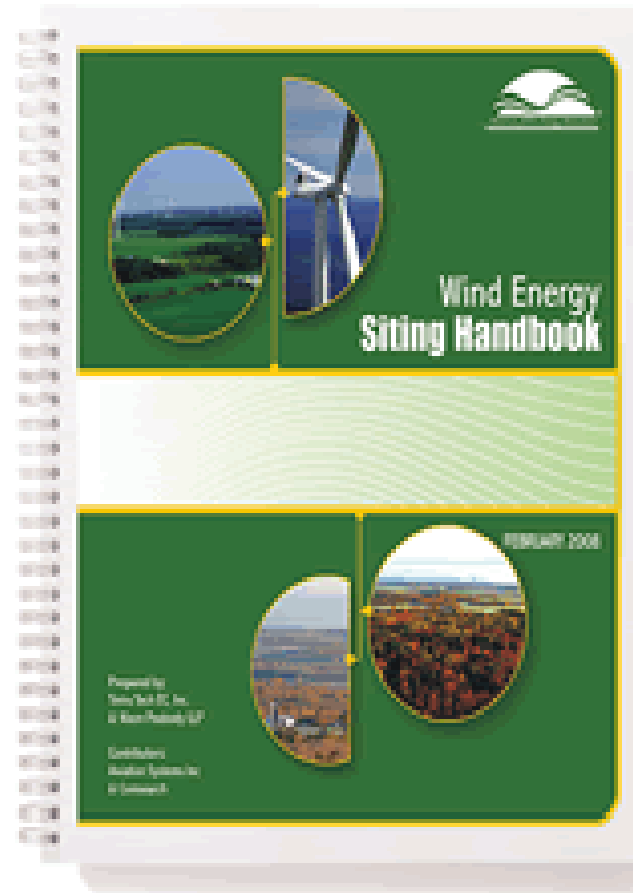


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Resource - AWEA Siting Handbook

- More in-depth information on environmental assessment and permitting for wind projects
- Published February 2008
- Collaborative effort from the AWEA Siting Committee, prepared by Tetra Tech EC and Nixon Peabody LLC, with contributing text from Comsearch and Aviation Systems
- <http://www.awea.org/sitinghandbook>



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Tetra Tech: Wind Industry Leader

- Involved on almost **250 wind projects** across North America totaling more than **20,000 MW**
- Includes over **20 wind construction projects** in the past two years valued at **more than \$340 million** representing almost **2,000 MW**
- Over **12,000 MW** of wind generation we have worked on is either in operation or scheduled for construction
- Grid connection feasibility studies for over **45 renewable energy projects**.



Maple Ridge Wind Farm, NY



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