



## A Profile in Using Green Remediation Strategies

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**Former Nebraska Ordnance Plant**  
Mead, NE

**Federal Facility**  
Superfund NPL

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**Cleanup Objectives:** Remove trichloroethene (TCE) and destroy explosives in ground water

**Green Remediation Strategy:** Uses a 10-kW wind turbine to power ground-water circulation wells (GCWs) for air stripping and ultraviolet treatment

- Calculated a total GCW electricity demand of 767 kWh each month
- Determined electricity demand could be met by site conditions: wind speed of 6.5 meters/second, shear exponent of 0.27, and turbulence intensity of 0.17-0.21

**Results:**

- Provides sufficient renewable energy for continued TCE removal and explosives destruction by the aboveground treatment system during grid inter-tie operation
- Reduces consumption of utility electricity by 26% during grid inter-tie operation
- Decreases CO<sub>2</sub> emissions by 24-32% during off-grid operation of the system's 230-volt submersible pump
- Returns surplus electricity to the grid for other consumer use
- Results in no observable impacts on wildlife
- Provides electricity cost savings expected to total more than \$40,000 over the next 15 years of treatment, based on an electricity rate of \$0.0546/kWh at the time of wind turbine startup
- Estimated that recovery for turbine capital/installation cost could be cut in half by improved GCW freeze-proofing
- Provides educational opportunities for Missouri University of Science and Technology (MST) students evaluating renewable energy, remediation, and electronic system technologies, with cost sharing support from Bergey, Inc. and Ohio Semitronics

**Property End Use:** Continued agricultural research and development, residential, and commercial use

*Point of Contact:* [Dave Drake](#), U.S. EPA Region 7 and [Curt Elmore](#), MST

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*The 10-kW Bergey Excel S wind turbine system arrived at the site in December 2003.*



*The turbine manufacturer provided personnel to assist in turbine installation and electrical equipment setup. GCW retrofit included installation of a new circuit box enabling the system to operate in grid inter-tie mode.*



*The turbine was attached to a 100-foot guyed lattice tower and hoisted into place adjacent to an existing GCW.*



*Turbine operations began in January 2004. To quantify economic and environmental benefits gained by integration of wind energy, Missouri University of Science and Technology evaluated operation of the retrofit system during utility grid-intertie mode as well as off-grid mode.*



*Following January 2011 repair of the system's electrical inverter, the fully operational wind turbine continues to generate electricity and offset grid-supplied power used for groundwater cleanup.*

### **Former Nebraska Ordnance Plant**

Update: May 2011

[http://www.cluin.org/greenremediation/profiles/subtab\\_d6.cfm](http://www.cluin.org/greenremediation/profiles/subtab_d6.cfm)



**United States Environmental Protection Agency  
Office of Solid Waste and Emergency Response (5202P)**

**For more information:**  
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