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PUBLIC SERVICE COMMISSION

April 8, 2010

Mr. Darrell Nitschke  
Executive Secretary  
Director of Administration  
North Dakota Public Service Commission  
600 East Boulevard, Dept 408  
Bismarck, ND 58505-0408


**RE: Minnkota Power Cooperative's Infinity Wind Generation Project –  
Decommissioning Plan**

Dear Executive Secretary Nitschke:

Enclosed in the above-referenced matter are eight (8) copies of a Decommissioning Plan and Cost Estimate. This is being filed pursuant to a letter request dated March 5, 2010 from Janet Marquart.

Should you require anything further, please do not hesitate to contact me.

Respectfully submitted,

  
GERAD PAUL  
Staff Attorney

# **STATE OF NORTH DAKOTA PUBLIC SERVICE COMMISSION**

## **1.0 INTRODUCTION**

Pursuant to ND Administrative Code 69-09-09-06 and 69-09-09-07, this document identifies a decommissioning plan prepared with respect to Minnkota Power Cooperative's two (2) 900 kW wind turbine generators. These wind turbine generators comprise Minnkota Power's "Infinity Wind Project" and are located east of Petersburg, ND, along U.S. Highway 2, and east of Valley City, ND, along Interstate 94.

This plan identifies the methodology that Minnkota Power will use to mitigate potential impacts resulting from the cessation of operation of each facility at the end of the wind turbine generator's useful life. The plan identifies the specific components that will be removed, the costs associated with the removal and any salvage value.

## **2.0 DECOMMISSIONING PLAN**

All decommissioning and restoration activities will be completed in accordance with all applicable state and local permits and will involve evaluating and categorizing all components and material based on their anticipated post-Project use. The categories will include recondition and reuse, salvage and disposal.

Wind turbines are bolted to the foundation and pedestal and can be removed in a relatively straightforward manner using appropriately sized cranes and equipment. If the wind turbines are sold for reuse, the rotor, nacelle and tower sections would be disassembled and transported from the site in a manner similar as would have been used to deliver the turbines to the site.

If the wind turbines are not sold for reuse, they would be disassembled and sold for scrap. This would require the same cranes as used for assembly. The hub, blades and nacelle would be removed to ground and stripped of any high value components. Tower sections would be lowered to grade and cut into transportable sections for delivery to a scrap metal purchaser. Control cabinets in the base would be stripped of any high value components and the balance turned over to a scrap company for disposal. The area would then be cleaned and all debris removed.

Future value will depend on a variety of factors, including the development of other alternative energy technologies. The decommissioning and restoration process includes the:

- removal of above-ground structures (turbines, transformers, signs);
- removal of below-ground structures (foundations);

- removal of access roads and crane pads;
- restoration of topsoil and
- re-vegetation and seeding.

## 2.1 Aboveground Equipment Removal

### Wind Turbine

The wind turbines are comprised of the tower, nacelle and blades which are modular items that can be disassembled. Tower wiring is also included in the equipment removal. It is possible that portions of both the nacelle and interior generator can be salvaged for scrap value.

Similar to the initial construction, the disassembly will require the use of cranes and heavy equipment. Tower sections and rotors will be transported in the same manner as their delivery to the site. Transportation costs are factored into the salvage value.

### Transformer

The pad mount transformer at the base of the wind turbine generally would have little wear and would be valuable for reuse. Transformer removal will consist of disconnecting the electrical connection system from the base transformer after which the transformer can be removed and transported offsite.

### Termination Panel

Transformer junction box and A.C. panel will be removed from site.

### Signage

Signs and lighting will be removed and disposed of as necessary.

## 2.2 Ground Line and Below Equipment Removal

### Turbine and Transformer Foundations

The turbine and substation foundations will be excavated to a depth of 36 inches below existing grade, removing all anchor bolts, rebar and concrete. The excavation will be back-filled with clean compatible sub-grade material compacted to a density similar to the surrounding area. All disturbed areas will be restored to pre-existing conditions and contours.

### Crane Pads

Crane pads are 50'x50' gravel covered areas and will likely have caused compaction of the soil. Unexcavated areas would be tilled in a manner adequate to restore the topsoil and sub-grade material to the density consistent with surrounding areas. At the conclusion of the

decommissioning activities, the crane pad area will be restored to pre-existing conditions unless instructed, in writing, to remain at the landowner's request.

#### Underground Cable

The underground cables will be cut back and abandoned in place. Removal of the cables would not be cost effective for the decommissioning of the Project. No hazards are presently known to exist from the presence of unused cables. Cables will be cut back to 36" below existing grade.

#### Tower Access Roads

Access roads and other land surfaces may be retained by the landowner if requested as such in writing. Otherwise, the access roads will be graded into the soils to the approximate the existing topography. This area would be covered with topsoil from the site and the vegetation would be re-established.

All of the disturbed areas would be graded, top-soiled and reseeded according to the National Resource Conservation Service guidelines or other, then applicable rules.

### 2.3 Summary of Decommissioning

The wind turbine generators have an expected useful life of at least 20 years. This anticipated lifespan was factored into the computation of the estimated salvage value. Within eight months after a turbine has reached its useful life (after no electricity generation for a continuing period of 24 months), decommissioning shall begin and be completed within 18 months.

The demolition contractor will remove decommissioning debris to a disposal facility permitted to operate under the current and applicable regulations at the time the equipment is removed.

The cost of the decommissioning would be paid for using funds obtained from internally generated cash flows at Minnkota Power. If ordered by the North Dakota Public Service Commission, Minnkota Power will provide documents showing financial assurance, acceptable to the NDPS Commission, to cover the anticipated cost of decommissioning.

## 3.0 **DECOMMISSIONING COSTS**

The net cost to decommission the Project is equal to the cost to perform the decommissioning tasks of Section 2, less the resale value of the equipment, either for reuse or for scrap.

### 3.1 Decommissioning Costs with Turbine Resale

The greatest value of the removed wind turbines would be realized by selling them for reuse. The wind turbines have a value of approximately \$1.0 million dollars each just prior to their installation in 2001-2002. After installation, Minnkota Power conservatively estimates the turbines would depreciate at a rate of 5% of the installation value every year thereafter for 20 years. The following table summarizes the resale value of a wind turbine calculated under these assumptions.

YEAR	Resale Value	Depreciation
0	\$1,000,000	NA
1	\$950,000	5 %
2	\$900,000	5 %
3	\$850,000	5 %
4	\$800,000	5 %
5	\$750,000	5 %
6	\$700,000	5 %
7	\$650,000	5 %
8	\$600,000	5 %
9	\$550,000	5 %
10	\$500,000	5 %
11	\$450,000	5 %
12	\$400,000	5 %
13	\$350,000	5 %
14	\$300,000	5 %
15	\$250,000	5 %
16	\$200,000	5 %
17	\$150,000	5 %
18	\$100,000	5 %
19	\$50,000	5 %
20	\$0	5 %

### 3.2 Decommissioning Costs with Turbine Salvage

A more conservative assessment of the decommissioning costs is made by assuming that the wind turbine cannot be sold for re-use and instead must be salvaged and sold for scrap. The following case assumes that all components, except for the transformer, will have no market value for re-use and is based solely on its value as scrap metal, with the greatest value being in the steel of the wind turbine tower. The value of steel was estimated at a price of \$370/ton as quoted in the spring of 2010. The removal cost includes the expense of equipment, labor, fuel, transportation and disposal costs.

ITEM	UNIT COST
Remove Blades/Hub	\$10,000

Remove Nacelle	\$7,800
Dismantle Tower	\$16,000
Remove Tower Foundation	\$10,000
Remove Transformer Foundation	\$500
Remove signage	\$1,500
Restore Crane Pad	\$6,000
Backfill and Ground Restoration	\$4,500
Salvage Value of Steel Components (\$370/ton)	(\$14,000)
Total per turbine	\$42,300