# Appendix I
# Meridian Wind Project Decommissioning Plan

# Decommissioning Plan and Reclamation Cost Estimate for the Meridian Wind Project Hyde County, South Dakota

April 2020

**PRESENTED TO**

**Meridian Wind Project, LLC**

**PRESENTED BY**

**Tetra Tech**

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# 1.0 INTRODUCTION

Tetra Tech was retained by Meridian Wind Project, LLC to prepare a decommissioning plan and cost analysis (Study) as part of an application for Energy Facility Permit from the South Dakota Public Utilities Commission (SDPUC) for the proposed Meridian Wind Project (Project). The scope of this Study is to review the Project details and develop a decommissioning plan and associated cost estimate for retiring the Project facilities at the end of its useful life.

# 2.0 PROJECT DESCRIPTION

The Project would be approximately 175 megawatt (MW) and would be located entirely within Hyde County in the Public Land Survey System townships of Van Order, Eagle, Chapelle, Highmore, and Holabird, approximately 3 miles southeast of Highmore. The Project would be located on privately held land within an area that encompasses approximately 15,043 acres (Project Area). The Project would utilize General Electric (GE) 2.72-MW wind turbine generators (WTGs). The current plan is to erect up to 64 GE 2.72-MW WTGs at the Project Area. Other major components for this Project include a Project substation, an interconnection switchyard, an approximately 8.91-mile 345-kilovolt (kV) interconnection transmission line, one permanent meteorological tower, an operations and maintenance (O&M) building, up to 24.6 miles of gravel access roads, and pad-mounted transformers at each WTG. These Project facilities are described in more detail below.

## 2.1 WIND TURBINE GENERATORS

The Project would consist of 64 GE 2.72-116 WTGs. The 2.72-MW turbines include 89-meter (292 feet), conical, tubular, steel towers. The rotor diameter is 116.5 meters (382.2 feet). All turbine components will be fully removed as part of decommissioning.

## 2.2 WIND TURBINE FOUNDATIONS

Each WTG would be supported by a cylindrical concrete pedestal on top of a sloped, octagonal or circular concrete spread footing, as is commonly used throughout the wind industry. The cylindrical concrete pedestal is proposed to be approximately 18 to 20 feet in diameter and 4 feet tall. Less than 1 foot of the pedestal will extend above-grade. The sloped, octagonal concrete base beneath the pedestal would extend downward an additional 7 to 9 feet. The base of the foundation is expected to have a bottom diameter of approximately 62 to 66 feet. The total foundation depth would be approximately 10 to 12 feet below grade.

## 2.3 ACCESS ROADS

Each wind turbine would have an access road to allow for vehicle access to facilitate inspections and maintenance of the turbines and associated equipment during operation. The access roads would be 16 feet wide and would consist of crushed gravel overlying compacted subgrade. The Study accounts for removal of approximately 24.6 miles of access roads. All public and county roads are assumed to remain in place after decommissioning.

## 2.4 COLLECTION SYSTEM

Each WTG generates three-phase electrical power that is transformed to 34.5-kV with an oil-filled, medium-voltage, pad-mounted transformer located adjacent to the base of the turbine. All such transformers will be removed as part of decommissioning.

The Project would include an underground 34.5-kV electrical power collection system that collects the electrical power from the wind turbines and routes it to the substation. A total of 38.6 miles of underground cable lines would

be buried to a minimum below-grade depth of at least 38 inches. Any cables (including both power and communication cabling) buried at a below-grade depth of 3 feet or less would be removed when the Project is decommissioned. All cables buried deeper than 3 feet below grade would be left in place when the Project is decommissioned.

## 2.5 PROJECT SUBSTATION

Power from each wind turbine would be delivered via underground power collection cabling to an on-site Project substation, where it would be stepped up from 34.5-kV to 345-kV via two main power transformers. The plans also include two high-voltage circuit breakers, one dead-end structure, substation steel structures, medium-voltage circuit breakers, switching devices, perimeter fencing, auxiliary equipment, and a control enclosure. All above-grade equipment within the perimeter fence of the substation, equipment foundations to a below-grade depth of 3 feet, as well as underground cables to a depth of 3 feet, would be removed as part of decommissioning.

The interconnection switchyard station would be owned and operated by Basin Electric Power Cooperative as part of the Triple H Wind Project. This switchyard is expected to include up to three 345-kV circuit breakers, three dead-end structures, substation steel structures, disconnect breakers, disconnect switches, bus conductors, auxiliary equipment, perimeter fencing, and a control enclosure, and is assumed to be decommissioned as a part of a separate project.

## 2.6 OVERHEAD TRANSMISSION LINE

Output from the Project would be delivered to the existing transmission system via a 345-kV interconnection transmission line that would span approximately 8.91 miles. The proposed high-voltage transmission line would remain in place after decommissioning to be removed as the scope of another Project.

## 2.7 O&M BUILDING

The Project includes an on-site O&M building consisting of spare parts storage and an area for minor maintenance. This building would be a pre-fabricated metal building with a reinforced concrete foundation. The proposed 8,000-square-foot building, as well as the surrounding gravel and perimeter fencing, is assumed to be decommissioned as a part of a separate project.

## 2.8 METEOROLOGICAL TOWERS

One permanent meteorological tower would be installed as part of this Project. The tower would be a lattice-type tower that typically ranges in height from 80 to 90 meters and is supported by guy wires. The tower would be fully removed as part of decommissioning, including its supporting foundations down to 3 feet below grade.

# 3.0 ANTICIPATED LIFE OF MERIDIAN WIND PROJECT

Megawatt-scale wind turbine generators available on the market today have a life expectancy of more than 25 years. The tubular steel towers supporting the generators are robust and with basic routine maintenance would serve many years beyond the life expectancy of the generators.

As the Project WTGs approach the end of their expected life, technological advances should make available more efficient and cost-effective generators that would economically drive the replacement of the existing generators and thus prolong the economic life of the Project to an expected 30 years. Once the Project has met its design life, it will need to be decommissioned. The following sections provide a description of the decommissioning work and the estimated costs associated with that work.

# 4.0 DECOMMISSIONING PROCESS DESCRIPTION

All decommissioning and restoration activities will adhere to the requirements of appropriate governing authorities, and will be in accordance with all applicable federal, state, and local permits.

The decommissioning and restoration process comprises removal of all above-ground structures; removal of below-ground structures to a depth of 3 feet; restoration of topsoil, revegetation, and seeding; and a 2-year monitoring and remediation period.

Project-related above-ground structures include the WTGs, step-up (pad-mounted) transformers, meteorological tower, overhead electrical transmission lines, and the substation. Below-ground structures include WTG foundations, collection system conduits/cable, foundations for the meteorological tower, substation foundations, and drainage structures. The proposed high-voltage transmission line (345-kV line) would remain in place after decommissioning, but all facilities interior to the Project would be removed. The Project O&M building, Aircraft Detection Lighting System (ADLS) unit, and interconnection switch station would be shared with the Triple H Project and have been included in its decommissioning plan. Therefore, the Project O&M building, ADLS unit, and interconnection switch station is not be included in this decommissioning plan and cost estimate.

It is assumed that the Project would incur costs for removal and disposal of the WTGs, wind turbine foundations, and other Project facilities, as well as costs for the restoration of the Project Area. Above-grade steel, aluminum, and copper equipment, however, is expected to have significant scrap value to a salvage contractor. All recyclable materials will be recycled to the extent possible, while all other non-recyclable waste materials will be disposed of in accordance with state and federal law.

The process of removing structures involves evaluating and categorizing all components and materials into categories of recondition and reuse, salvage, recycling, and disposal. In the interest of increased efficiency and minimal transportation impacts, components and material may be stored on-site in a pre-approved location until the bulk of similar components or materials are ready for transport. The components and material will be transported to the appropriate facilities for reconditioning, salvage, recycling, or disposal.

## 4.1 WTG REMOVALS

During the decommissioning process, access roads to turbines may be widened temporarily to sufficient width to accommodate movement of appropriately sized cranes or other machinery required for the disassembly and removal of the turbines. High-value components will be stripped. The remaining material will be reduced to shippable dimension and transported offsite for proper disposal. Control cabinets, electronic components, and internal cables will be removed. The blades, hub, and nacelle will be lowered to the ground for disassembly. The tower sections will also be lowered to the ground where they will be further disassembled into transportable sections. The blades, hub, nacelle, and tower sections will either be transported whole for reconditioning and reuse or disassembled into salvageable, recyclable, or disposable components. Each WTG area will be thoroughly cleaned and all debris removed.

Once removed, the wind turbine blades will be cut into manageably-sized sections, loaded onto a trailer, and hauled to a local landfill for disposal; the wind turbine blades are primarily constructed from a composite material that is assumed to have no salvage value at the time of decommissioning.

## 4.2 TURBINE ACCESS ROADS

All crushed rock surfacing will be removed from the Project's access roads. The removed crushed rock will be loaded into dump trucks and hauled offsite for disposal. Following the removal of crushed rock surfacing, the compacted subgrade will be de-compacted and a layer of topsoil will be added to replace the removed rock. The

areas where crushed rock has been removed will be fine graded to provide suitable drainage. In right-of-way and non-agricultural areas, the ground will be seeded to prevent erosion.

## 4.3 WTG FOUNDATION REMOVAL

Topsoil will be removed from an area surrounding the foundation and stored for later replacement. Turbine foundations will be excavated to a depth sufficient to remove all anchor bolts, rebar, conduits, cable, and concrete to a depth of 36 inches below grade. After removal of all noted foundation materials, the hole will be filled with clean subgrade material of quality comparable to the immediate surrounding area. The subgrade material will be compacted to a density similar to surrounding subgrade material. All unexcavated areas compacted by equipment used in decommissioning shall be de-compacted in a manner to adequately restore the topsoil and subgrade material to the proper density consistent and compatible with the surrounding area. These areas will be thoroughly cleaned and all debris removed.

## 4.4 O&M BUILDING

The 8,000-square-foot O&M building, as well as the surrounding gravel and perimeter fencing, will be demolished/removed and disposed offsite as a part of another project's scope.

## 4.5 UNDERGROUND ELECTRICAL COLLECTION SYSTEM

The cables and conduits will be removed to a depth of at least 3 feet below ground surface (bgs). All cable and conduit buried greater than 3 feet bgs will be left in place and abandoned. They contain no materials known to be harmful to the environment and will not interfere with future agricultural-related use of the area.

## 4.6 OVERHEAD TRANSMISSION LINE

The proposed high-voltage transmission line would remain in place after decommissioning to be removed as the scope of another project.

## 4.7 SUBSTATION

Disassembly of the substation and associated switchyard will be completed and all material/equipment removed from the site. Steel, conductors, switches, transformers, etc. will be reconditioned and reused, sold as scrap, recycled, or disposed of appropriately depending on market value. Foundations and underground components will be removed to a depth of 3 feet and the excavation filled, contoured, and revegetated. All unexcavated areas compacted by equipment used in decommissioning shall be de-compacted in a manner to adequately restore the topsoil and subgrade material to the proper density consistent and compatible with the surrounding area. The area will be thoroughly cleaned and all debris removed.

## 4.8 METEOROLOGICAL TOWER

One permanent meteorological tower will be disassembled at an appropriate time during the decommissioning activities so as not to interfere with the other ongoing work. This typically involves the use of a base crane to dismantle the mast, section by section, down to the foundation surface. The instrumentation and booms would be either removed before the sections are laid down, or removed from the sections once on the ground.

The disassembly works includes the cost of labor, machinery, and tools to perform the dismantling tasks, including foundation removal to 3 feet below grade, and the loading of the dismantled material onto transport vehicles for removal from the site to an appropriate disposal, salvage, or rework facility.

# 5.0 SITE RESTORATION PROCESS DESCRIPTION

To the extent possible, topsoil will be removed prior to removal of structures from all work areas and stockpiled, clearly designated, and separated from other excavated material. Prior to topsoil replacement, all rocks 4 inches or greater will be removed from the surface of the subsoil. The topsoil will be de-compacted to match the density and consistency of the immediate surrounding area. The topsoil will be replaced to original depth, and original surface contours reestablished where possible. All rocks 4 inches or larger will be removed from the surface of the topsoil. Any topsoil deficiency and trench settling will be mitigated with imported topsoil consistent with the quality of the affected site.

All disturbed soil surfaces will be seeded with a seed mix agreed upon with the landowner(s) and/or applicable local, state, or federal agencies such as the U.S. Department of Agriculture. These areas will be restored to a condition and forage density similar to the original condition. In all areas, restoration will include, as reasonably required, leveling, terracing, mulching, and other necessary steps to prevent soil erosion, to ensure establishment of suitable grasses and forbs, and to control noxious weeds. Areas restored in agricultural fields will only be reseeded at request of the landowner. It is assumed that 50 percent of the access roads will be in agricultural areas.

# 6.0 ESTIMATED COST OF DECOMMISSIONING

At the time of retirement, the above-grade steel structures and turbine nacelles are assumed to have significant scrap value which would offset a portion of the cost to remove these items. However, the Project would also incur costs for removal and disposal of the wind turbine blades, foundations, and other Project facilities, along with the costs for the restoration of the site following the removal of salvageable equipment and disposal of other items.

The decommissioning cost estimate provided herein includes the costs to return the site to a condition compatible with the surrounding land and similar to the conditions that existed before development of the Project. Included in the estimate are the costs to decommission the power generating equipment associated with the Project, as well as the costs to retire the Project facilities, with all equipment and structures removed to a depth of 3 feet below grade. The following scenarios were considered when building the cost estimates:

- GE 2.72-MW model assuming salvage and no resale.
- GE 2.72-MW model assuming no salvage and no resale.

Cost estimates for the GE 2.72-MW model include 1) costs offset by the revenue that would be received for scrap value of steel, aluminum, and copper equipment (scrap credit) and 2) costs without scrap credit. No resale of the Project facilities for reuse is considered. Accordingly, they are “no resale” estimates.

The estimated decommissioning costs for the Project were prepared using available information from a variety of credible industry sources. As summarized in Appendix A, the current cost of decommissioning this Project is provided in Table 1 in 2020 dollars. The cost scenarios include no salvage value as well as a partial offset from the salvage value of the towers, turbine components, and electrical equipment.

**Table 1.** Decommissioning Cost by Turbine Model

| Turbine Model Scenario | Estimate Cost per Turbine | Estimated Cost per MW |
|---|---|---|
| GE 2.72-MW model assuming salvage | $86,650 | $31,853 |
| GE 2.72-MW model without salvage | $157,769 | $57,996 |

The detailed reclamation cost estimates are provided in Appendix B.

# APPENDIX A. SUMMARY OF ESTIMATED COST OF DECOMMISSIONING PER TURBINE

## SUMMARY OF ESTIMATED COST OF DECOMMISSIONING PER TURBINE

| **Decommissioning cost per MW (in current dollars)** | | | | |
|---|---|---|---|---|
| GE 2.8 MW Turbines with Salvage | | | | |
| | **Quantity** | **Unit** | **Unit Price** | **Total** |
| ***Mob/Demob*** | | | | |
| Equipment, facilities & personnel | 1 | lump sum | $ 900,299 | |
| Site Facilities - rental | 1 | lump sum | $ 12,930 | |
| | | | | $ 913,229 |
| ***Field Management*** | | | | |
| $18,282.31/week | 24 | week | $ 438,776 | $ 438,776 |
| ***Substation & Switchyard Removal*** | | | | |
| | 1 | lump sum | $ 201,400 | $ 201,400 |
| ***Removal of a Tower and Nacelle Units*** | | | | |
| Construct/remove temporary crane pads ($7,514/WTG) | 64 | each | $ 480,879 | |
| WTG Removal ($30,000/WTG) | 64 | each | $ 1,920,000 | |
| WTG foundation removal | 64 | each | $ 594,675 | |
| WTG Sizing & Loadout | 64 | each | $ 2,569,007 | $ 5,564,561 |
| ***Salvage*** | | | | |
| (Net salvage value of $3,715,416.00 for scrap metal from transformer, WTG, and pad mounted transformers) | 1 | each | $ 3,836,160 | *salvage value* |
| | | | | $ (3,836,160) |
| ***Pad mounted transformer removal*** | | | | |
| $3,625/WTG | 64 | each | $ 231,995 | |
| | | | | $ 231,995 |
| ***Site Restoration, Seeding and Re-vegetation*** | | | | |
| (≈24.6 miles of access roadway, 1 acre O&M site, 8 acre substation & switchyard, and .5 acres/turbine site) | 1 | lump sum | $ 744,946 | $ 744,946 |
| ***Removal of Transmission Line*** | | | | |
| (*Not applicable*) | | | $ - | |
| | | | | $ - |
| ***O&M Building Removal*** | | | | |
| Building demo, foundation removal & off-site disposal | | | $ - | |
| (to be done by others) | | | | $ - |
| ***Access Road Removal*** | | | | |
| (≈24.6 miles of gravel road) | 38,485 | CY | $ 415,157 | |
| 16' wide and 6" depth | | | | $ 415,157 |
| ***Administrative & Project Management Tasks*** | | | | |
| Home office, Project Management | 1 | lump sum | $ 233,695 | |
| Contractor OH & fee (13%) | 1 | lump sum | $ 637,988 | $ 871,683 |
| ***Total Removal Cost for 64 Turbines (174.1 MW)*** | **1** | **lump sum** | | **$ 5,545,587** |
| *Removal Cost/WTG* | **64** | **each** | *$ 86,650* | |
| *Removal Cost/MW* | 174.1 | each | *$ 31,853* | |

| **Decommissioning cost per MW (in current dollars)** | | | | |
|---|---|---|---|---|
| GE 2.72 MW Turbines without Salvage | | | | |
| | **Quantity** | **Unit** | **Unit Price** | **Total** |
| ***Mob/Demob*** | | | | |
| Equipment, facilities & personnel | 1 | lump sum | $ 900,299 | |
| Site Facilities - rental | 1 | lump sum | $ 12,930 | |
| | | | | $ 913,229 |
| ***Field Management*** | | | | |
| $18,282.31/week | 24 | week | $ 438,775 | $ 438,775 |
| ***Substation & Switchyard Removal*** | | | | |
| | 1 | lump sum | $ 201,400 | $ 201,400 |
| ***Removal of a Tower and Nacelle Units*** | | | | |
| Construct/remove temporary crane pads ($7,514/WTG) | 64 | each | $ 480,879 | |
| WTG Removal ($30,000/WTG) | 64 | each | $ 1,920,000 | |
| WTG foundation removal | 64 | each | $ 594,675 | |
| WTG Sizing & Loadout | 64 | each | $ 2,569,007 | $ 5,564,561 |
| ***Salvage*** | | | | |
| (*Not applicable*) | 1 | each | $ - | |
| | | | | $ - |
| ***Pad mounted transformer removal*** | | | | |
| $3,625/WTG | 64 | each | $ 231,995 | |
| | | | | $ 231,995 |
| ***Site Restoration, Seeding and Re-vegetation*** | | | | |
| (≈24.6 miles of access roadway, 1 acre O&M site, 8 acre substation & switchyard, and .5 acres/turbine site) | 1 | lump sum | $ 744,946 | $ 744,946 |
| ***Removal of Transmission Line*** | | | | |
| (*Not applicable*) | | | | |
| | | | | $ - |
| ***O&M Building Removal*** | | | | |
| Building demo, foundation removal & off-site disposal | 1 | lump sum | $ - | |
| (to be done by others) | | | | $ - |
| ***Access Road Removal*** | | | | |
| (≈24.6 miles of gravel road) | 38,485 | CY | $ 415,157 | |
| 16' wide and 6" depth | | | | $ 415,157 |
| ***Administrative & Project Management Tasks*** | | | | |
| Home office, Project Management | 1 | lump sum | $ 425,503 | |
| Contractor OH & fee (13%) | 1 | lump sum | $ 1,161,624 | $ 1,587,127 |
| ***Total Removal Cost for 64 Turbines (174.1 MW)*** | **1** | **lump sum** | | **$ 10,097,190** |
| *Removal Cost/WTG* | **64** | **each** | *$ 157,769* | |
| *Removal Cost/MW* | 174.1 | each | *$ 57,996* | |

Assumptions:

The scope of work and individual tasks were established using professional experience, in collaboration with Tetra Tech's engineering staff. The Project was broken into individual tasks that were each estimated separately to include labor requirements, equipment needs, and duration. Production rates were established using professional experience and published standards that include RS Means (www.rsmeans.com). Labor rates prevalent to the geographic area of the Project were obtained by referencing U.S. Department of Labor wage determinations. After the estimate was completed, typical average markups that are industry standard were applied for contingency, overhead, and fee. Estimating methods and assumptions specific to this estimate are as follows:

- Labor cost were developed by reviewing U.S. Department of Labor wage determinations and rates published by RS Means. An average rate was developed that includes base wage, fringe, and payroll tax liability. The final rate used in the estimate is an average of 40 hours standard (ST), and 10 hours overtime (OT) per week, assuming a 50-hour work week during decommissioning activities.
- Equipment (commonly referred to as yellow iron) rates used in the estimate are developed by reviewing rates published by RS Means, and historical vendor quotes. Rates include fuel, maintenance, and wear and tear of ground engaging components. Rates utilized assume the use of rental equipment, not owned.
- Mobilization and demobilization costs are estimated to be approximately 13 percent or less of the overall contractor's costs. This reflects the actual cost to mobilize equipment, facilities and crew to the Project site. A substantial portion of this cost is for the crane and crew required for WTG removal. This amount does not include the front loading of cost from other tasks.
- Work was estimated on a unit cost basis, priced by task that follows the progression of work from start to finish. Unit costs are developed by including the labor, equipment, and production rate required for each individual task. RS Means and estimator's experience are utilized to establish the crew, equipment and production for each individual task.
- Roads would be restored so that they become a part of the natural surroundings and are no longer recognizable to the greatest extent possible. Road gravel would be used to backfill foundation locations to within 6 inches of final grade. It is expected that the remaining road gravel will be accepted by local receivers with no additional disposal cost. Access roads located on agricultural land, assumed to be 20 percent of roads, will not be reseeded. On private lands, prior existing roads would be restored at the request of the current landowner.
- All concrete foundations will be removed to a depth of 3 feet bgs. Gravel from road removal will be utilized to backfill to within 6 inches of final grade, and then completed with an additional 6 inches of topsoil. Concrete foundation removal will be accomplished with the use of excavators with concrete breakers. Processed concrete will be transported offsite under the same assumptions as road gravel.
- Underground electrical distribution cabling is assumed to be aluminum, at least 38 inches deep, and of low salvage value. As such, underground cable will be abandoned in place, with only the stubs to grade being removed down to 3 feet bgs.
- Oil from transformers and nacelles will be drained prior to removal, and the oil disposed of following state and federal regulations. Oil disposal cost is assumed to be $4 per gallon.
- To reduce the cost of loading and transport, WTG components, substation transformers, and equipment will be sized onsite utilizing shears and torch crews. Blades are assumed to have no scrap value, and will incur an estimated cost of $95 per ton for trucking and landfill fees. Remaining material is assumed to have a scrap value, with a cost of $65 per ton for trucking, and a credit of $216 per ton for scrap.
- WTG removal will require the construction and subsequent removal of temporary crane pads. Estimated cost of crane pads are based on an engineered design from a similar project.
- Final restoration will include the placement of 6 inches of topsoil on all disturbed areas, with a final seeding utilizing a mix of native grasses. It is assumed that 50 percent of the topsoil required for restoration is available onsite as a result of the original installation.
- The costs for temporary facilities have been included in the restoration cost. These include one office trailer, two Conex storage units, portolets, first aid supplies and utilities.
- Field management during construction activities has been added to the estimate. These costs include one Superintendent, one Health and Safety Representative and two Field Engineers. These positions are critical to the safe and successful execution of work.
- A contractor's home office, project management, overhead, and fee can vary widely by contractor. As such, averages were developed for the estimate and added as a percentage of total cost. These include 5

percent for home office and project management, and 13 percent for overhead and fee. Note that contractor contingency costs are not included. Several other miscellaneous costs have been approximated, including permits, engineering, signage, fencing, traffic control, utility disconnects, etc. In the context of the overall estimate, these are incidental costs that are covered in the estimate markups.

# ATTACHMENT B. DETAILED RECLAMATION COST ESTIMATE

**From Cost Item:** . **To Cost Item:** .

| Code | Description | Forecast (T/O) Quantity | Unit of Measure | Unit Cost | Total Cost (Forecast) | Currency |
|---|---|---|---|---|---|---|
| 1 | MERIDIAN WIND RETIREMENT (2.72 MW TURBINES) - WITH SCRAP CREDIT | | | | | |
| 1.1 | Mob / Demob | 1.00 | Lump Sum | $900,299.26 | $900,299.26 | U.S. Dollar |
| 1.1.1 | Equipment Mob | 1.00 | Lump Sum | $101,500.00 | $101,500.00 | U.S. Dollar |
| 1.1.2 | Site Facilities | 1.00 | Lump Sum | $2,200.00 | $2,200.00 | U.S. Dollar |
| 1.1.3 | Crew Mob & Site Setup | 3.00 | Day | $14,319.85 | $42,959.56 | U.S. Dollar |
| 1.1.4 | Crew Demob & Site Cleanup | 2.00 | Day | $14,319.85 | $28,639.70 | U.S. Dollar |
| 1.1.5 | Mob-Erection Sub | 1.00 | Lump Sum | $725,000.00 | $725,000.00 | U.S. Dollar |
| 1.2 | Site Facilities | 6.00 | Month | $2,155.00 | $12,930.00 | U.S. Dollar |
| 1.3 | Field Management | 24.00 | Week | $18,282.31 | $438,775.52 | U.S. Dollar |
| 1.4 | Substation & Switchyard Removal | 1.00 | Lump Sum | $201,399.95 | $201,399.95 | U.S. Dollar |
| 1.4.1 | Fence Removal | 1.00 | Day | $1,202.19 | $1,202.19 | U.S. Dollar |
| 1.4.2 | Transformer & Switchyard Equip Removal | 1.00 | Each | $142,694.91 | $142,694.91 | U.S. Dollar |
| 1.4.2.1 | Oil Removal & Disposal | 1.00 | Each | $104,492.79 | $104,492.79 | U.S. Dollar |
| 1.4.2.1.1 | Oil Removal | 1.00 | Each | $1,742.79 | $1,742.79 | U.S. Dollar |
| 1.4.2.1.2 | Oil Disposal | 25,000.00 | Gallon | $4.00 | $100,000.00 | U.S. Dollar |
| 1.4.2.1.3 | Trucking - Per Load | 2.00 | Each | $1,375.00 | $2,750.00 | U.S. Dollar |
| 1.4.2.2 | Demo & Prepare For Shipment Offsite | 150.00 | Ton | $189.68 | $28,452.12 | U.S. Dollar |
| 1.4.2.3 | Salvage & Recovery | 150.00 | Ton | $65.00 | $9,750.00 | U.S. Dollar |
| 1.4.2.3.1 | Scrap Trucking Cost | 150.00 | Ton | $65.00 | $9,750.00 | U.S. Dollar |
| 1.4.3 | Remove Control Building | 1.00 | Each | $2,546.81 | $2,546.81 | U.S. Dollar |
| 1.4.3.1 | Demo & Prepare For Shipment Offsite | 10.00 | Ton | $189.68 | $1,896.81 | U.S. Dollar |
| 1.4.3.2 | Salvage & Recovery | 10.00 | Ton | $65.00 | $650.00 | U.S. Dollar |
| 1.4.3.2.1 | Scrap Trucking Cost | 10.00 | Ton | $65.00 | $650.00 | U.S. Dollar |
| 1.4.4 | UG Utility & Ground Removal | 2.00 | Day | $1,202.19 | $2,404.37 | U.S. Dollar |
| 1.4.5 | Remove Foundations To Subgrade | 500.00 | Cubic Yard | $34.43 | $17,213.22 | U.S. Dollar |
| 1.4.5.1 | Excavate / Remove Foundation - Various Depth | 500.00 | Cubic Yard | $16.86 | $8,428.60 | U.S. Dollar |
| 1.4.5.2 | Concrete Transport Offsite | 500.00 | Cubic Yard | $17.57 | $8,784.62 | U.S. Dollar |
| 1.4.6 | Misc. Material Disposal | 1.00 | Lump Sum | $1,675.00 | $1,675.00 | U.S. Dollar |
| 1.4.6.1 | Trucking - Per Load | 1.00 | Each | $1,375.00 | $1,375.00 | U.S. Dollar |
| 1.4.6.2 | Disposal Cost | 10.00 | Ton | $30.00 | $300.00 | U.S. Dollar |
| 1.4.7 | Restore Yard | 1.00 | Lump Sum | $33,663.46 | $33,663.46 | U.S. Dollar |
| 1.4.7.1 | Backfill / Regrade | 4.00 | Acre | $1,540.15 | $6,160.62 | U.S. Dollar |
| 1.4.7.2 | Vegetative Cover | 2,000.00 | Cubic Yard | $12.22 | $24,442.84 | U.S. Dollar |
| 1.4.7.2.1 | Topsoil, Delivered | 1,000.00 | Cubic Yard | $10.00 | $10,000.00 | U.S. Dollar |
| 1.4.7.2.2 | Placement | 2,000.00 | Cubic Yard | $7.22 | $14,442.84 | U.S. Dollar |
| 1.4.7.3 | Re-Seed With Native Vegetation | 4.00 | Acre | $765.00 | $3,060.00 | U.S. Dollar |
| 1.5 | Construct & Remove Temporary Crane Pads | 64.00 | Each | $7,513.73 | $480,878.92 | U.S. Dollar |
| 1.5.1 | Crane Pad 4" Stone 8" depth | 6,400.00 | Ton | $34.66 | $221,805.95 | U.S. Dollar |
| 1.5.2 | Crane Pad 2" Stone 6" depth | 4,800.00 | Ton | $37.88 | $181,805.95 | U.S. Dollar |
| 1.5.3 | Remove stone after erection | 64.00 | Each | $1,207.30 | $77,267.02 | U.S. Dollar |
| 1.6 | WTG Removal | 64.00 | Each | $30,000.00 | $1,920,000.00 | U.S. Dollar |
| 1.6.1 | Remove Top,Nacell, Rotor | 64.00 | Each | $20,000.00 | $1,280,000.00 | U.S. Dollar |
| 1.6.2 | Remove Base & MId | 64.00 | Each | $10,000.00 | $640,000.00 | U.S. Dollar |
| 1.7 | WTG Sizing & Loadout - 2.8 MW, 89 m Tower | 64.00 | Each | $40,140.74 | $2,569,007.56 | U.S. Dollar |
| 1.7.1 | Oil Removal & Disposal | 64.00 | Each | $356.46 | $22,813.21 | U.S. Dollar |

| Code | Description | Forecast (T/O) Quantity | Unit of Measure | Unit Cost | Total Cost (Forecast) | Currency |
|---|---|---|---|---|---|---|
| 1.7.1.1 | Oil Removal | 64.00 | Each | $174.28 | $11,153.86 | U.S. Dollar |
| 1.7.1.2 | Oil Disposal | 2,560.00 | Gallon | $4.00 | $10,240.00 | U.S. Dollar |
| 1.7.1.3 | Trucking - Per Load | 1.03 | Each | $1,375.00 | $1,419.35 | U.S. Dollar |
| 1.7.2 | Demo & Prepare For Shipment Offsite - Top, Mid & Base | 10,432.00 | Ton | $66.32 | $691,870.74 | U.S. Dollar |
| 1.7.3 | Demo & Prepare For Shipment Offsite - Hub | 2,048.00 | Ton | $66.32 | $135,827.38 | U.S. Dollar |
| 1.7.4 | Demo & Prepare For Shipment Offsite - Nacelle | 4,480.00 | Ton | $66.32 | $297,122.40 | U.S. Dollar |
| 1.7.5 | Demo & Prepare For Shipment Offsite - Down Tower Assembly | 192.00 | Ton | $66.32 | $12,733.82 | U.S. Dollar |
| 1.7.6 | Salvage & Recovery | 64.00 | Each | $17,355.00 | $1,110,720.00 | U.S. Dollar |
| 1.7.6.1 | Scrap Trucking Cost | 17,088.00 | Ton | $65.00 | $1,110,720.00 | U.S. Dollar |
| 1.7.7 | Blade T&D | 3,136.00 | Ton | $95.00 | $297,920.00 | U.S. Dollar |
| 1.8 | WTG Foundation Removal | 64.00 | Each | $9,291.79 | $594,674.33 | U.S. Dollar |
| 1.8.1 | Remove 13' x 3' Cylindrical Pedestal | 960.00 | Cubic Yard | $44.63 | $42,840.22 | U.S. Dollar |
| 1.8.2 | Remove Top 2' Of Octagonal Base | 9,344.00 | Cubic Yard | $45.85 | $428,402.18 | U.S. Dollar |
| 1.8.3 | Concrete Transport Offsite | 10,304.00 | Cubic Yard | $11.98 | $123,431.93 | U.S. Dollar |
| 1.9 | Pad Mount Transformer Removal | 64.00 | Each | $3,624.92 | $231,995.04 | U.S. Dollar |
| 1.9.1 | Oil Removal & Disposal | 64.00 | Each | $2,964.74 | $189,743.15 | U.S. Dollar |
| 1.9.1.1 | Oil Removal | 64.00 | Each | $98.20 | $6,285.09 | U.S. Dollar |
| 1.9.1.2 | Oil Disposal | 44,800.00 | Gallon | $4.00 | $179,200.00 | U.S. Dollar |
| 1.9.1.3 | Trucking - Per Load | 3.10 | Each | $1,375.00 | $4,258.06 | U.S. Dollar |
| 1.9.2 | Remove & Loadout Transformer | 64.00 | Each | $105.76 | $6,768.59 | U.S. Dollar |
| 1.9.3 | Salvage & Recovery | 64.00 | Each | $520.00 | $33,280.00 | U.S. Dollar |
| 1.9.3.1 | Scrap Trucking Cost | 512.00 | Ton | $65.00 | $33,280.00 | U.S. Dollar |
| 1.9.4 | Remove Foundations To Subgrade | 64.00 | Each | $34.43 | $2,203.29 | U.S. Dollar |
| 1.9.4.1 | Excavate / Remove Foundation - Various Depth | 64.00 | Cubic Yard | $16.86 | $1,078.86 | U.S. Dollar |
| 1.9.4.2 | Concrete Transport Offsite | 64.00 | Cubic Yard | $17.57 | $1,124.43 | U.S. Dollar |
| 1.10 | Access Road Removal | 38,485.00 | Cubic Yard | $10.79 | $415,157.48 | U.S. Dollar |
| 1.11 | Site Restoration | 1.00 | Lump Sum | $744,946.00 | $744,946.00 | U.S. Dollar |
| 1.11.1 | Vegetative Cover | 50,000.00 | Cubic Yard | $12.22 | $611,071.00 | U.S. Dollar |
| 1.11.1.1 | Topsoil, Delivered | 25,000.00 | Cubic Yard | $10.00 | $250,000.00 | U.S. Dollar |
| 1.11.1.2 | Placement | 50,000.00 | Cubic Yard | $7.22 | $361,071.00 | U.S. Dollar |
| 1.11.2 | Re-Seed With Native Vegetation - Roads & Areas Disturbed By Construction | 175.00 | Acre | $765.00 | $133,875.00 | U.S. Dollar |
| 1.12 | Scrap Metals Credit | 1.00 | Lump Sum | ($3,836,160.00) | ($3,836,160.00) | U.S. Dollar |
| 1.12.1 | Scrap Metals Credit - Transformer & Switchyard | 150.00 | Ton | ($216.00) | ($32,400.00) | U.S. Dollar |
| 1.12.2 | Scrap Metals Credit - Control Building | 10.00 | Ton | ($216.00) | ($2,160.00) | U.S. Dollar |
| 1.12.3 | Scrap Metals Credit - WTG | 17,088.00 | Ton | ($216.00) | ($3,691,008.00) | U.S. Dollar |
| 1.12.4 | Scrap Metals Credit - Pad Mount Transformer | 512.00 | Ton | ($216.00) | ($110,592.00) | U.S. Dollar |
| 1.13 | Home Office, Project Management (5% Of Cost) | 1.00 | Lump Sum | $233,695.20 | $233,695.20 | U.S. Dollar |
| 1.14 | Contractor OH & Fee (13% Of Cost) | 1.00 | Lump Sum | $637,987.87 | $637,987.87 | U.S. Dollar |
| **Total:** | **MERIDIAN WIND RETIREMENT (2.72 MW TURBINES) - WITH SCRAP CREDIT** | | | | **$5,545,587.12** | |
| **Grand Total:** | | | | | **$5,545,587.12** | |

**From Cost Item:** . **To Cost Item:** .

| Code | Description | Forecast (T/O) Quantity | Unit of Measure | Unit Cost | Total Cost (Forecast) | Currency |
|---|---|---|---|---|---|---|
| 2 | MERIDIAN WIND RETIREMENT (2.72 MW TURBINES) - WITHOUT SCRAP CREDIT | | | | | |
| 2.1 | Mob / Demob | 1.00 | Lump Sum | $900,299.26 | $900,299.26 | U.S. Dollar |
| 2.1.1 | Equipment Mob | 1.00 | Lump Sum | $101,500.00 | $101,500.00 | U.S. Dollar |
| 2.1.2 | Site Facilities | 1.00 | Lump Sum | $2,200.00 | $2,200.00 | U.S. Dollar |
| 2.1.3 | Crew Mob & Site Setup | 3.00 | Day | $14,319.85 | $42,959.56 | U.S. Dollar |
| 2.1.4 | Crew Demob & Site Cleanup | 2.00 | Day | $14,319.85 | $28,639.70 | U.S. Dollar |
| 2.1.5 | Mob-Erection Sub | 1.00 | Lump Sum | $725,000.00 | $725,000.00 | U.S. Dollar |
| 2.2 | Site Facilities | 6.00 | Month | $2,155.00 | $12,930.00 | U.S. Dollar |
| 2.3 | Field Management | 24.00 | Week | $18,282.31 | $438,775.52 | U.S. Dollar |
| 2.4 | Substation & Switchyard Removal | 1.00 | Lump Sum | $201,399.95 | $201,399.95 | U.S. Dollar |
| 2.4.1 | Fence Removal | 1.00 | Day | $1,202.19 | $1,202.19 | U.S. Dollar |
| 2.4.2 | Transformer & Switchyard Equip Removal | 1.00 | Each | $142,694.91 | $142,694.91 | U.S. Dollar |
| 2.4.2.1 | Oil Removal & Disposal | 1.00 | Each | $104,492.79 | $104,492.79 | U.S. Dollar |
| 2.4.2.1.1 | Oil Removal | 1.00 | Each | $1,742.79 | $1,742.79 | U.S. Dollar |
| 2.4.2.1.2 | Oil Disposal | 25,000.00 | Gallon | $4.00 | $100,000.00 | U.S. Dollar |
| 2.4.2.1.3 | Trucking - Per Load | 2.00 | Each | $1,375.00 | $2,750.00 | U.S. Dollar |
| 2.4.2.2 | Demo & Prepare For Shipment Offsite | 150.00 | Ton | $189.68 | $28,452.12 | U.S. Dollar |
| 2.4.2.3 | Salvage & Recovery | 150.00 | Ton | $65.00 | $9,750.00 | U.S. Dollar |
| 2.4.2.3.1 | Scrap Trucking Cost | 150.00 | Ton | $65.00 | $9,750.00 | U.S. Dollar |
| 2.4.3 | Remove Control Building | 1.00 | Each | $2,546.81 | $2,546.81 | U.S. Dollar |
| 2.4.3.1 | Demo & Prepare For Shipment Offsite | 10.00 | Ton | $189.68 | $1,896.81 | U.S. Dollar |
| 2.4.3.2 | Salvage & Recovery | 10.00 | Ton | $65.00 | $650.00 | U.S. Dollar |
| 2.4.3.2.1 | Scrap Trucking Cost | 10.00 | Ton | $65.00 | $650.00 | U.S. Dollar |
| 2.4.4 | UG Utility & Ground Removal | 2.00 | Day | $1,202.19 | $2,404.37 | U.S. Dollar |
| 2.4.5 | Remove Foundations To Subgrade | 500.00 | Cubic Yard | $34.43 | $17,213.22 | U.S. Dollar |
| 2.4.5.1 | Excavate / Remove Foundation - Various Depth | 500.00 | Cubic Yard | $16.86 | $8,428.60 | U.S. Dollar |
| 2.4.5.2 | Concrete Transport Offsite | 500.00 | Cubic Yard | $17.57 | $8,784.62 | U.S. Dollar |
| 2.4.6 | Misc. Material Disposal | 1.00 | Lump Sum | $1,675.00 | $1,675.00 | U.S. Dollar |
| 2.4.6.1 | Trucking - Per Load | 1.00 | Each | $1,375.00 | $1,375.00 | U.S. Dollar |
| 2.4.6.2 | Disposal Cost | 10.00 | Ton | $30.00 | $300.00 | U.S. Dollar |
| 2.4.7 | Restore Yard | 1.00 | Lump Sum | $33,663.46 | $33,663.46 | U.S. Dollar |
| 2.4.7.1 | Backfill / Regrade | 4.00 | Acre | $1,540.15 | $6,160.62 | U.S. Dollar |
| 2.4.7.2 | Vegetative Cover | 2,000.00 | Cubic Yard | $12.22 | $24,442.84 | U.S. Dollar |
| 2.4.7.2.1 | Topsoil, Delivered | 1,000.00 | Cubic Yard | $10.00 | $10,000.00 | U.S. Dollar |
| 2.4.7.2.2 | Placement | 2,000.00 | Cubic Yard | $7.22 | $14,442.84 | U.S. Dollar |
| 2.4.7.3 | Re-Seed With Native Vegetation | 4.00 | Acre | $765.00 | $3,060.00 | U.S. Dollar |
| 2.5 | Construct & Remove Temporary Crane Pads | 64.00 | Each | $7,513.73 | $480,878.92 | U.S. Dollar |
| 2.5.1 | Crane Pad 4" Stone 8" depth | 6,400.00 | Ton | $34.66 | $221,805.95 | U.S. Dollar |
| 2.5.2 | Crane Pad 2" Stone 6" depth | 4,800.00 | Ton | $37.88 | $181,805.95 | U.S. Dollar |
| 2.5.3 | Remove stone after erection | 64.00 | Each | $1,207.30 | $77,267.02 | U.S. Dollar |
| 2.6 | WTG Removal | 64.00 | Each | $30,000.00 | $1,920,000.00 | U.S. Dollar |
| 2.6.1 | Remove Top,Nacell, Rotor | 64.00 | Each | $20,000.00 | $1,280,000.00 | U.S. Dollar |
| 2.6.2 | Remove Base & MId | 64.00 | Each | $10,000.00 | $640,000.00 | U.S. Dollar |
| 2.7 | WTG Sizing & Loadout - 2.8 MW, 89 m Tower | 64.00 | Each | $40,140.74 | $2,569,007.56 | U.S. Dollar |
| 2.7.1 | Oil Removal & Disposal | 64.00 | Each | $356.46 | $22,813.21 | U.S. Dollar |

| Code | Description | Forecast (T/O) Quantity | Unit of Measure | Unit Cost | Total Cost (Forecast) | Currency |
|---|---|---|---|---|---|---|
| 2.7.1.1 | Oil Removal | 64.00 | Each | $174.28 | $11,153.86 | U.S. Dollar |
| 2.7.1.2 | Oil Disposal | 2,560.00 | Gallon | $4.00 | $10,240.00 | U.S. Dollar |
| 2.7.1.3 | Trucking - Per Load | 1.03 | Each | $1,375.00 | $1,419.35 | U.S. Dollar |
| 2.7.2 | Demo & Prepare For Shipment Offsite - Top, Mid & Base | 10,432.00 | Ton | $66.32 | $691,870.74 | U.S. Dollar |
| 2.7.3 | Demo & Prepare For Shipment Offsite - Hub | 2,048.00 | Ton | $66.32 | $135,827.38 | U.S. Dollar |
| 2.7.4 | Demo & Prepare For Shipment Offsite - Nacelle | 4,480.00 | Ton | $66.32 | $297,122.40 | U.S. Dollar |
| 2.7.5 | Demo & Prepare For Shipment Offsite - Down Tower Assembly | 192.00 | Ton | $66.32 | $12,733.82 | U.S. Dollar |
| 2.7.6 | Salvage & Recovery | 64.00 | Each | $17,355.00 | $1,110,720.00 | U.S. Dollar |
| 2.7.6.1 | Scrap Trucking Cost | 17,088.00 | Ton | $65.00 | $1,110,720.00 | U.S. Dollar |
| 2.7.7 | Blade T&D | 3,136.00 | Ton | $95.00 | $297,920.00 | U.S. Dollar |
| 2.8 | WTG Foundation Removal | 64.00 | Each | $9,291.79 | $594,674.33 | U.S. Dollar |
| 2.8.1 | Remove 13' x 3' Cylindrical Pedestal | 960.00 | Cubic Yard | $44.63 | $42,840.22 | U.S. Dollar |
| 2.8.2 | Remove Top 2' Of Octagonal Base | 9,344.00 | Cubic Yard | $45.85 | $428,402.18 | U.S. Dollar |
| 2.8.3 | Concrete Transport Offsite | 10,304.00 | Cubic Yard | $11.98 | $123,431.93 | U.S. Dollar |
| 2.9 | Pad Mount Transformer Removal | 64.00 | Each | $3,624.92 | $231,995.04 | U.S. Dollar |
| 2.9.1 | Oil Removal & Disposal | 64.00 | Each | $2,964.74 | $189,743.15 | U.S. Dollar |
| 2.9.1.1 | Oil Removal | 64.00 | Each | $98.20 | $6,285.09 | U.S. Dollar |
| 2.9.1.2 | Oil Disposal | 44,800.00 | Gallon | $4.00 | $179,200.00 | U.S. Dollar |
| 2.9.1.3 | Trucking - Per Load | 3.10 | Each | $1,375.00 | $4,258.06 | U.S. Dollar |
| 2.9.2 | Remove & Loadout Transformer | 64.00 | Each | $105.76 | $6,768.59 | U.S. Dollar |
| 2.9.3 | Salvage & Recovery | 64.00 | Each | $520.00 | $33,280.00 | U.S. Dollar |
| 2.9.3.1 | Scrap Trucking Cost | 512.00 | Ton | $65.00 | $33,280.00 | U.S. Dollar |
| 2.9.4 | Remove Foundations To Subgrade | 64.00 | Each | $34.43 | $2,203.29 | U.S. Dollar |
| 2.9.4.1 | Excavate / Remove Foundation - Various Depth | 64.00 | Cubic Yard | $16.86 | $1,078.86 | U.S. Dollar |
| 2.9.4.2 | Concrete Transport Offsite | 64.00 | Cubic Yard | $17.57 | $1,124.43 | U.S. Dollar |
| 2.10 | Access Road Removal | 38,485.00 | Cubic Yard | $10.79 | $415,157.48 | U.S. Dollar |
| 2.11 | Site Restoration | 1.00 | Lump Sum | $744,946.00 | $744,946.00 | U.S. Dollar |
| 2.11.1 | Vegetative Cover | 50,000.00 | Cubic Yard | $12.22 | $611,071.00 | U.S. Dollar |
| 2.11.1.1 | Topsoil, Delivered | 25,000.00 | Cubic Yard | $10.00 | $250,000.00 | U.S. Dollar |
| 2.11.1.2 | Placement | 50,000.00 | Cubic Yard | $7.22 | $361,071.00 | U.S. Dollar |
| 2.11.2 | Re-Seed With Native Vegetation - Roads & Areas Disturbed By Construction | 175.00 | Acre | $765.00 | $133,875.00 | U.S. Dollar |
| 2.12 | Home Office, Project Management (5% Of Cost) | 1.00 | Lump Sum | $425,503.20 | $425,503.20 | U.S. Dollar |
| 2.13 | Contractor OH & Fee (13% Of Cost) | 1.00 | Lump Sum | $1,161,623.71 | $1,161,623.71 | U.S. Dollar |
| **Total:** | **MERIDIAN WIND RETIREMENT (2.72 MW TURBINES) - WITHOUT SCRAP CREDIT** | | | | **$10,097,190.96** | |
| **Grand Total:** | | | | | **$10,097,190.96** | |