Lava Ridge Wind Project
Plan of Development

Magic Valley Energy, LLC

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1.0 PROJECT DESCRIPTION

1.1 Introduction

This Plan of Development ("POD") is prepared in support of an application by Magic Valley Energy, LLC ("MVE" or "the Proponent") to the Bureau of Land Management ("BLM") for authorization to use federal lands for the construction, operation, maintenance, and decommissioning of an up to 400-turbine wind energy generating facility and ancillary facilities. The proposed project will be known as the "Lava Ridge Wind Project," sometimes referred to herein as the "Project" or "Facility." The Project is located approximately 25 miles northeast of Twin Falls, Idaho in the BLM Shoshone Field Office management area. The majority of lands required for Project implementation are managed by BLM, with relatively fewer potential parcels that are state or privately owned.

The Facility will generally comprise of wind turbine generators, new and improved access roads, electrical collector and transmission lines, onsite substations with associated components, fiber optic communications equipment, interconnecting substation additions, battery energy storage system, operations and maintenance facilities, temporary construction staging areas, batch plants, and other ancillary facilities. The Project's planned 500 kilovolt ("kV") generation intertie may interconnect at the existing Idaho Power Midpoint substation approximately seven miles south of Shoshone, Idaho, or at an alternative location along the permitted but not yet constructed Southwest Intertie Project – Northern Portion ("SWIP-North") (IDI-26446).

MVE's anticipated schedule for the Project includes: 1) an approximately two year development period during which the applicable permits and approvals are sought, targeting completion of development during the third calendar quarter of 2022; 2) an approximately two year construction timeframe with initial commercial operations commencing during the fourth calendar quarter of 2024; and 3) an operations period of up to 30 years. The Project may be constructed in a phased manner depending on MVE's continued commercial analysis and the electrical market conditions at the end of the development period.

1.2 Purpose and Need for the Project

MVE's purpose for the Project is to reliably and economically produce renewable energy with wind turbine generators for delivery to power markets in the western United States, including those markets accessed via interconnection to the existing Midpoint Substation or to an alternative new substation constructed along the permitted, but not yet constructed, Southwest Intertie Project – Northern Portion. Construction and operation of the Project will:

- provide a new economic and reliable renewable energy source;
- have the ability to serve multiple power markets in the western United States, including those accessible through use of the Southwest Intertie Project transmission corridor;
- provide economic benefits to the State of Idaho, and the local counties of Jerome, Lincoln and Minidoka, including the creation of new jobs;

- contribute to the achievement of renewable energy and carbon reduction goals.
- maximize the potential extraction of wind energy to make the resource economically attractive to customers while balancing environmental sensitivities

The need for the Project arises from regulatory, utility, and consumer driven objectives to incorporate increasing amounts of renewable/carbon free energy sources into energy supply portfolios. Substantial amounts of new renewable energy resources are required to meet this need. A majority of states in the western U.S. have specific renewable energy goals. These goals include:

- Idaho Power Company: 100% clean energy goal by 2045
- State of Nevada: 50% renewable supply by 2030; 100% carbon-free by 2050
- State of California: 50% renewable supply by 2025; 60% by 2030; 100% zero-carbon supply by 2045
- State of Arizona: 15% renewable supply by 2025
- State of Utah: 20% renewable supply by 2025
- State of Oregon: 50% renewable supply by 2040
- State of Washington: 100% carbon-free by 2045
- State of Montana: 15% renewable supply since 2015
- State of New Mexico: 50% renewable supply by 2030, 100% carbon-free supply by 2045
- City of Los Angeles: 100% carbon-free by 2045

If Idaho Power Company alone were to meet all of its clean energy goals with renewables it would need over two thousand megawatts by 2045.

A recent joint California agency[1] analysis anticipates that nearly 900 MW of new wind generation needs to come online *annually* for the next 25 years in order to meet California's clean energy goals.

For many western states, these clean energy goals are bold objectives that will require 10's of thousands of megawatts of incremental renewable energy resources to achieve these standards. In addition, providing reliable electric supply that is increasingly sourced from renewable energy will most likely require load serving entities to look beyond their immediate service territory to provide locational diversity of renewable generators. Renewable supply portfolios with greater locational diversity can hedge against localized weather conditions affecting their ability to provide reliable service to their customers and help achieve a more economic portfolio of supply resources. Existing and planned transmission pathways will enable the Project to deliver renewable energy to load serving entities in many of the western states listed above.

[1] California Energy Commission, California Public Utilities Commission, and the California Air Resources Board; https://www.energy.ca.gov/event/workshop/2020-12/notice-senate-bill-100-draft-report-workshop

The proposed Project location was selected based on the quality of the wind resource in the area, the power markets accessible by existing and planned transmission lines in the area, the availability of suitable land, and the absence of land use constraints such as wildlife management areas, areas of critical environmental concern ("ACECs"), designated wilderness areas, wilderness study areas ("WSAs"), roadless areas, and other restrictive land use designations. Due to its location in relative proximity to existing population centers and infrastructure, the proposed siting of the Project will minimize environmental impacts and demands on local municipal services. Further, the Project will enhance the local economy by creating employment opportunities, tax revenues, and support of local businesses. Wind energy projects such as the proposed Project also help displace fossil-fuel electric generation with clean, renewable power, which reduces overall greenhouse gas (GHG) emissions.

1.3 General Facility Description, Design, and Operation

1.3.1 Project Location, Land Ownership, and Jurisdiction

The Project will be located primarily on public lands managed by the BLM Shoshone Field Office within the Idaho counties of Jerome, Lincoln, and Minidoka. Relative to the surrounding communities, the general area for development is on open range land east of Shoshone, north of Eden and Hazelton, and west of Minidoka. Dietrich is the closest community to the development area. Siting of wind turbine strings will concentrate in the higher elevation lands associated with several buttes in the Project area, with arrays of wind turbines located on mid-elevation lands between the buttes. The prominent buttes on the landscape within the development area include Wilson Butte, Cinder Butte, Owinza Butte, Sid Butte, and Kimama Butte.

The vast majority of Project features will be located on BLM managed lands. Several State of Idaho owned parcels are also present within the Project area and would provide opportunities to locate additional wind turbines, collector and transmission lines, and potentially other ancillary features. Tracts of privately owned parcels are adjacent to and interspersed within the development area. MVE may approach select private landowners where efficiencies in design may be realized by locating wind turbines or other Project features on those parcels.

1.3.2 Legal Land Description of Facility

A detailed legal land description of the Project area can be found in Appendix B.

1.3.3 Total Acreage and General Dimensions

Table 1-1 provides a summary of the anticipated project components, long- and short-term right-of-way encumbrances, and associated disturbance acreages.

Table 1-1: Project Components, Quantities, and Disturbance

Project Component	Long-Term ROW (acres)	Short-Term ROW (acres)	Temporary Disturbance (acres)	Permanent Disturbance (acres)
Wind Turbines	2864	0	2545	319
34.5 kV Collector System	2611	0	399	20
230 kV Transmission System	538	0	173	18
500 kV Transmission System	576	0	133	26
Permanent Access Roads	1349	0	0	1349
Temporary Road and Crane Disturbance	1689	284	1973	0
Substations	101	26	26	101
Battery Storage Facility	40	5	5	40
O&M Facilities	46	12	12	46
Staging Yards and Batch Plants	0	106	106	0
ADLS	4	0	3	1
Permanent Met Towers	12	0	10	2
TOTAL	**9830**	**433**	**5385**	**1922**

1.3.4 Number and Size of Wind Turbines

Several factors influence the number and size of wind turbines for any given project and make it impractical to identify with certainty the exact characteristics of the turbine during the early development stage. Manufacturers' advancement in turbine technology during the wind project development period can offer opportunities to deploy more efficient models that are better suited to the Project area's wind resource. The ultimate selection of a specific turbine model is an iterative process that considers the wind resource, siting constraints, mitigation requirements, and the timing of a specific turbine's availability in relation to the construction schedule. While the specific turbine model and its associated size characteristics will not be known until late in the development phase, MVE is able to define the anticipated range of potential wind turbine units that may be sited within the Project including the number of units as well as a range of key sizing characteristics.

A wind turbine typically consists of three main components: the nacelle, tower, and rotor blades. The nacelle houses the generator, gearbox, and (in some cases) the transformer while supporting the rotor and blades at the hub. The turbine tower supports and provides access to the nacelle. MVE expects the turbine hub will be between 260 and 460 feet above the ground, depending on the turbine model selected. The turbine blades would extend between 130 and 280 feet from the hub, meaning a rotor diameter between 260 and 560 feet and a rotor "swept area" between 53,100 and 246,400 square feet. When a blade is in-line with the tower, the maximum height will be between 390 and 740 feet. Refer to Figure 1-1 for a drawing showing these typical wind turbine sizes.

Table 1-2: Minimum and Maximum Turbine Characteristics

Characteristic	Minimum	Maximum
Hub Height (ft.)	260	460
Rotor Diameter (ft.)	260	560
Rotor Swept Area (sq. ft.)	53,100	246,400
Total Height (ft.)	390	740

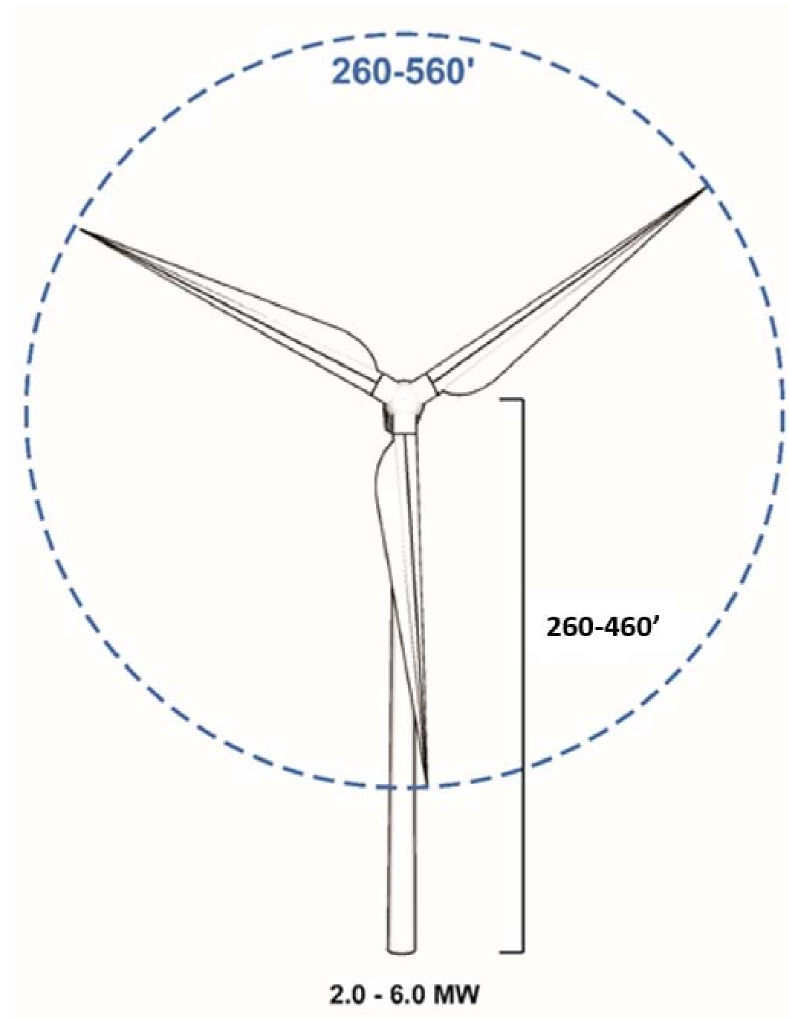


Figure 1-1: Typical Wind Turbine Sizes

The generating capacity of a specific turbine often closely correlates with its size. Turbine models with a relatively higher generating capacity tend to be taller with larger rotor swept areas. To achieve the intended overall Project generating capacity, a larger number of smaller individual turbines may deployed, or a smaller number of larger turbines may be deployed, or a mix of small and large turbines may be deployed based on turbine selection factors mentioned above.

MVE is proposing up to 400 total wind turbine generators for the Project. The total generating capacity of the Project would then depend on the individual capacity ratings of the turbine models selected for the Project. As an example, if a turbine model with a 3-megawatt (MW) generating capacity is determined to be best suited for the Project, constructing 400 of those individual turbines would equate to a 1,200 MW project. If a turbine model with a 4 MW generating capacity is ideal for the Project, 400 of those individual turbines would equate to a 1,600 MW project. As siting constraints, turbine technology and availability, and other factors listed above become refined during the development phase, MVE will be able to narrow the options for ultimate deployment.

1.3.5 Wind Turbine Configuration and Layout

MVE is proposing up to 400 individual turbines across the Project area to achieve the desired capacity of the Project. The turbines will be situated in rows (referred to as a “string” or “array” of turbines) that are expected to generally be in a north-south orientation based on the local prevailing wind direction. The separation between individual turbines within a given string and the distance between the strings themselves will be dependent on the size of turbine selected and other siting considerations. A preliminary turbine configuration and layout within the Project area is provided in Figure 6-1. This preliminary layout only considers placement of turbines on BLM managed and State lands. Turbine locations on neighboring private lands may be considered if mutually agreed to with the property owners.

The preliminary turbine locations have been proposed within ½ mile-wide siting corridors to allow for the flexibility to microsite individual turbines based on site-specific engineering or resource constraints. In addition to the proposed siting corridors, MVE has identified alternative turbine siting corridors to accommodate the relocation of turbines from the proposed corridors, at MVE’s discretion. Should MVE identify an engineering issue within the proposed corridors, or determine that relocating proposed turbines from a proposed to an alternative corridor will increase project efficiency, MVE may elect to make that adjustment. These siting corridors are represented in Figures 6-1 and 6-2, as well as on the Site Plans in Appendix A.

Siting corridors for supporting Project infrastructure (i.e. roads and collector system) have been proposed in a similar manner on the above-reference Project maps. Access roads and collector systems in alternative siting corridors would only be utilized should there be a relocation of turbines to the associated corridor. In most cases, this would translate to a reduction in access roads and collector lines from the Project corridor where turbines were removed.

1.3.6 Substations and Transmission Lines

Collector Lines: Each wind turbine will be connected to a system of overhead or underground electrical collector lines, typically designed to operate at 34.5 kV. Individual collector lines will run from turbine site to turbine site, and after connecting the optimum number of generators the line will proceed to a collector substation. The structures of the collector lines may be wood, steel, or concrete poles that are 60 – 90 feet tall and spaced 300 – 350 feet apart, depending on terrain.

Refer to Figure 1-2 for dimensions of a typical collector line and Figure 1-3 and Figure 1-4 for photos of a typical collector line. Preliminary routes of these collector lines are provided in Figure 6-1.

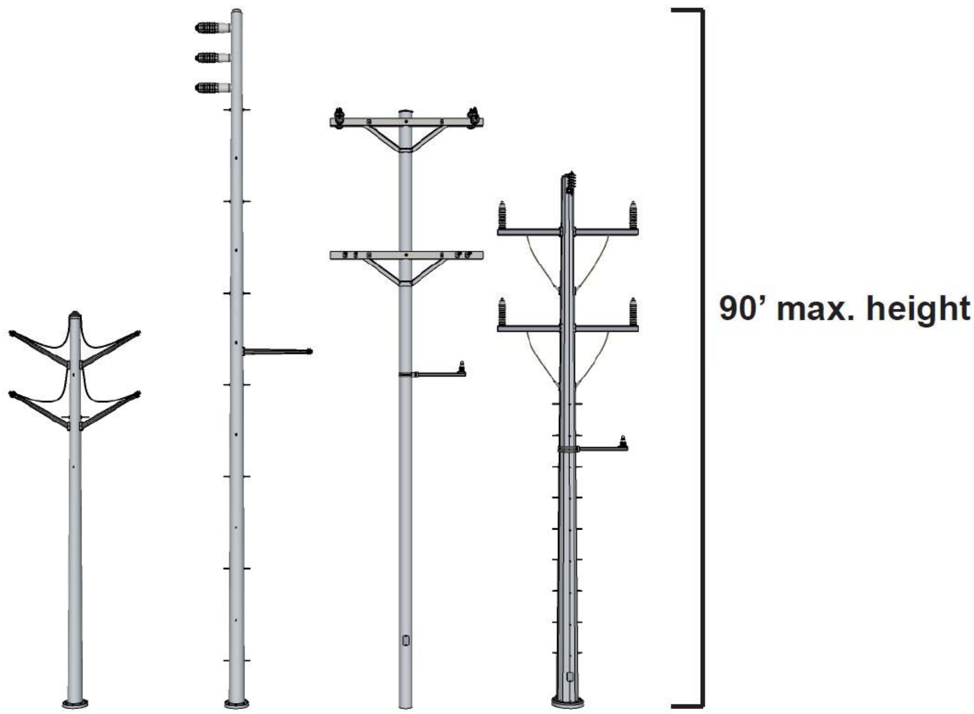


Figure 1-2: Typical Distribution Line Dimensions (Collector Line)

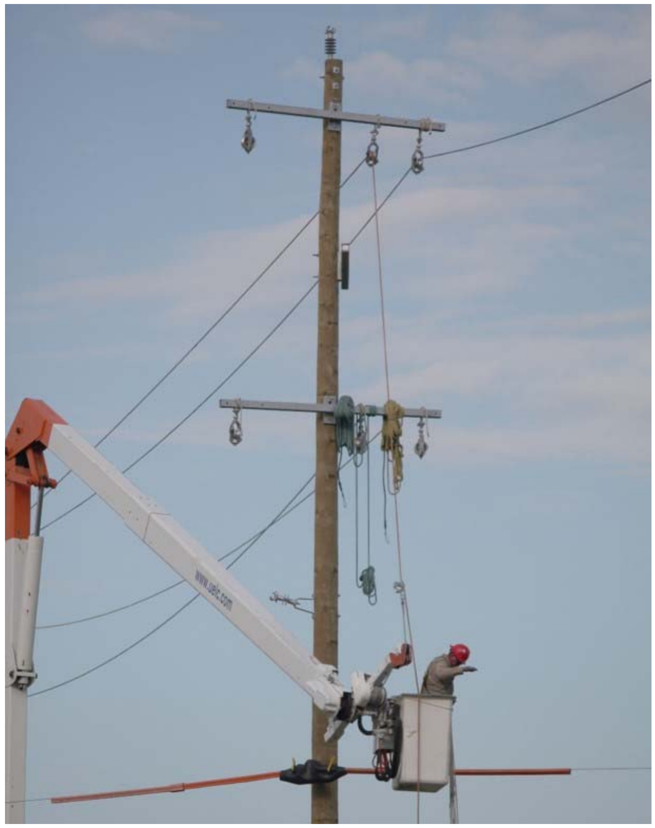


Figure 1-3: Typical Collector Line Structure

Figure 1-4: Typical Collector Lines

Junction Boxes: For long runs of underground cable, it will be beneficial to utilize a junction box in order to join segments together for a single circuit. Junction boxes are utilized to allow for ease of operations and maintenance in the event of a failure, and to allow for proper acceptance testing during installation. Junction boxes are typically located alongside an access road to allow for easy access. Similarly, at points in the underground portion of the collection system where the circuit needs to "branch" off in different directions to connect turbines, a three-way or four-way junction box is utilized to allow for efficient use of underground cable while lessening the overall disturbance.

Collector Substations: Up to five (5) 34.5 /230 kV collector substations will be located throughout the Project area to aggregate individual collector lines from turbine strings in the vicinity and increase the voltage to 230 kV. The collector substations will include electrical equipment such as transformers, medium-voltage and high-voltage circuit breakers, capacitor banks, electrical bus work, meters, disconnect switches and an electrical control house. Lightning arresters, overhead shield wires, and lightning masts will be installed in the substation to protect against over-voltages caused by lightning strikes. While final engineering will determine the exact components and placement within the substation, it is likely that that highest structure will not exceed 75 feet in height. Instrument transformers, relays, and a communication network will be used to detect, isolate and clear electrical faults as soon as practical to ensure the safety of equipment, personnel, and the public. Protective relaying will meet Institute of Electrical and Electronic Engineers (IEEE) requirements and will be coordinated with grid protection to ensure system reliability and safety is maintained.

Due to the size of the Project, the final design may utilize different size substations. For example, a large cluster of turbines may connect to a larger three-transformer substation, where a smaller cluster of turbines would connect to a smaller single-transformer substation. However, in order to minimize overall disturbance and provide a more efficient electrical design, MVE may elect to build multiple medium-sized substations as opposed to a single large substation in each area. See Figure 1-5 below for an example collector substation.

Figure 1-5: Example Collector Substation

230 kV Transmission Lines: A series of 230 kV overhead transmission lines will connect the collector substations to one larger substation where the voltage will be increased to 500 kV. The 230 kV transmission lines will parallel existing facilities and infrastructure to the extent practical in an effort to consolidate utility lines across the landscape. The 230 kV transmission lines may utilize single or double circuit lattice, H-Frame, or tubular monopole type structures that are comprised of angular steel, tubular steel, corten steel, concrete, wood, or a hybrid. The structure heights may range from 70 to 130 feet, and the average structure span may range from 400 to 1,000 feet. Examples of typical structure types and dimensions are provided in Figure 1-6 and Figure 1-7. The selection of specific tower type, height, and placement will be determined during the final design of the project, taking into account any physical constraints, results of electrical studies, National Electric Safety Code Standards, and applicable environmental factors.

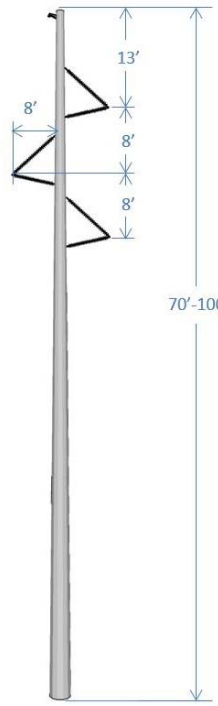


Figure 1-6: Typical 230 kV Monopole Structure

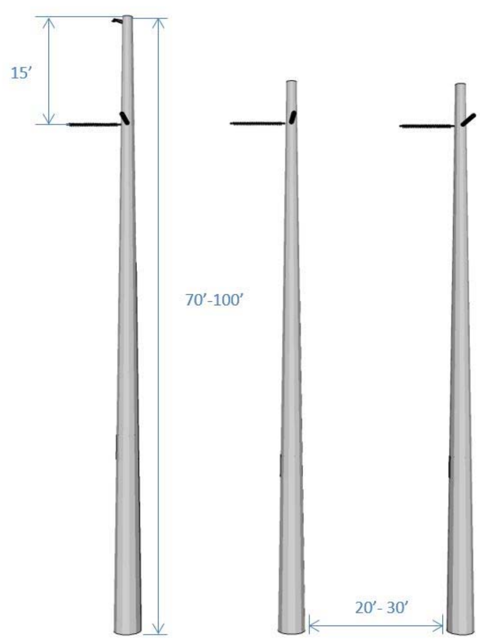


Figure 1-7: Typical 230 kV Monopole Angle Structure

The 230 kV transmission lines may be supported by concrete foundations, pre-cast concrete footings, direct-embedded structure segments, and may require the use of guy cables that are anchored to the ground. The structures will support three (3) phases of conductor per circuit, spaced 10 to 20 feet apart depending on structure type. Insulators and associated hardware will be used to position and support the conductor while maintaining electrical design clearances between the conductors and the structure. The structures will also support two (2) overhead ground wires at the top of the structures to protect the system from lightning strikes. One of the overhead ground wires may incorporate a fiber optic component that could be used for voice and data communication, protective relay telemetering, and for supervisory control and data acquisition.

230/500 kV Substation: The Project will include a single 230/500 kV substation that will aggregate the 230 kV transmission lines from the collector substations and increase the voltage to 500 kV. Similar to the collector substations, the 230/500 kV substation will include equipment such as transformers, high-voltage circuit breakers, capacitor banks, electrical bus work, meters, disconnect switches and an electrical control house. Lightning arresters, overhead shield wires, and lightning masts will be installed in the substation to protect against over-voltages caused by lightning strikes. Instrument transformers, relays, and a communication network will be used to detect, isolate and clear electrical faults as soon as practical to ensure the safety of equipment, personnel, and the public. Protective relaying will meet Institute of Electrical and Electronic Engineers (IEEE) requirements and will be coordinated with grid protection to ensure system reliability and safety is maintained. Refer to Figure 6-1 for the preliminary location of the 230/500 kV substation, and Figure 1-8 for a schematic drawing of typical substation components.

Typically, substations will have battery backups for redundancy of protection systems. The 230/500 kV substation may have diesel or propane backup generators. Backup generators are only intended to run during unplanned outage scenarios and predetermined operation cycles to confirm proper function. These occurrences are anticipated to be infrequent, short-duration activities with minimal noise impacts.

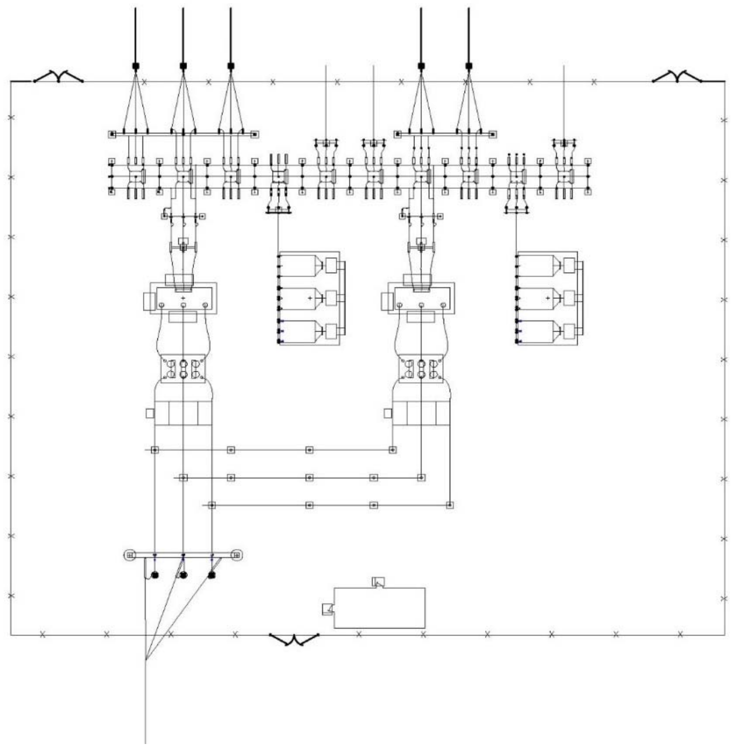


Figure 1-8: Typical Substation Layout

<u>500 kV transmission line:</u> An overhead 500 kV transmission line will connect the 230/500 kV substation to the Project's point of interconnection at Midpoint Substation or an alternative location along the SWIP-North alignment. The 500 kV transmission line will parallel existing facilities and infrastructure to the extent practical in an effort to consolidate utility lines across the landscape. Several types of transmission structures may be used for the 500 kV transmission line. The towers may be tubular steel guyed-V, lattice steel guyed-V, and self-supporting steel lattice, poles, and H-frame structures. The structures will be made of unpainted galvanized or Corten steel. The proposed tower configurations and typical heights are illustrated in Figures 1-9 through 1-14. Tower-to-tower span lengths will be dependent upon terrain and siting obstacles within or near the ROW, and will typically be 1,000 to 1,600 feet.

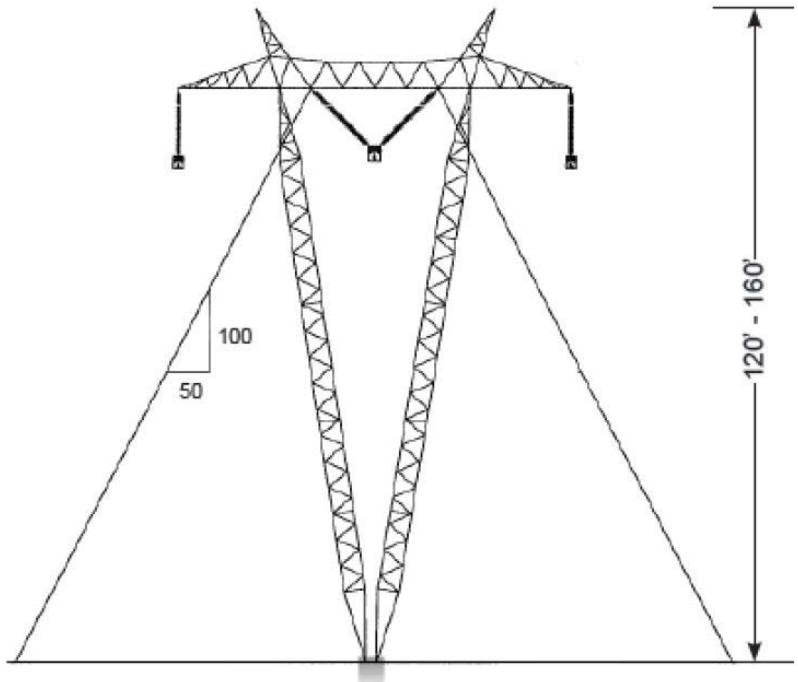


Figure 1-9: Typical Lattice Guyed V Tangent Tower

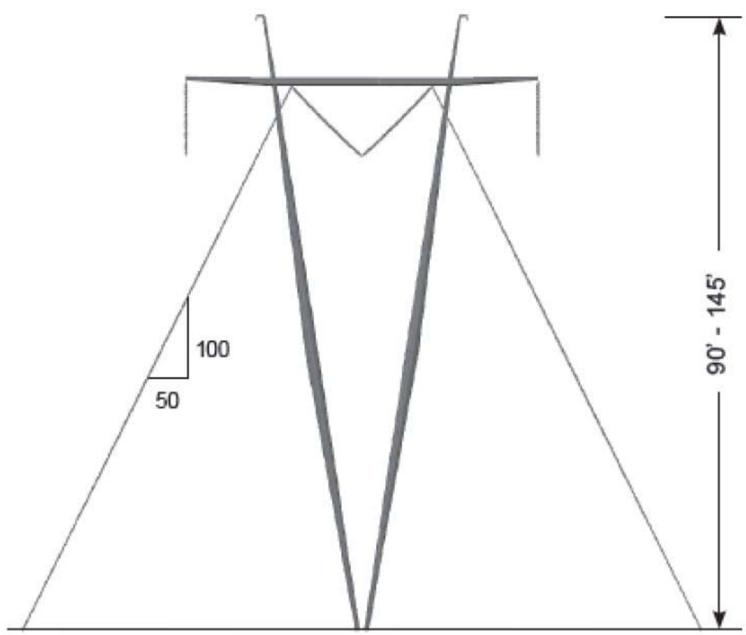


Figure 1-10: Typical Tubular Guyed V Tangent Tower

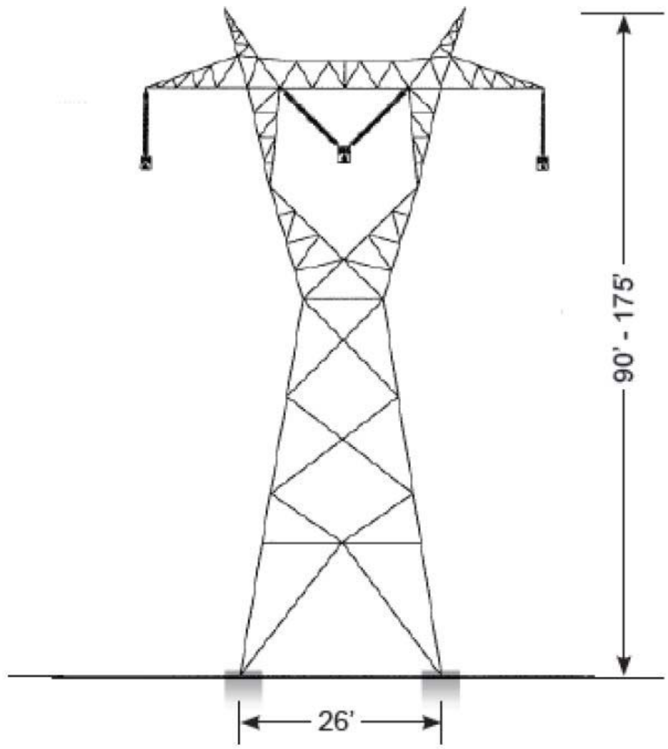


Figure 1-11: Typical Single Circuit Lattice Self-Supporting Tower

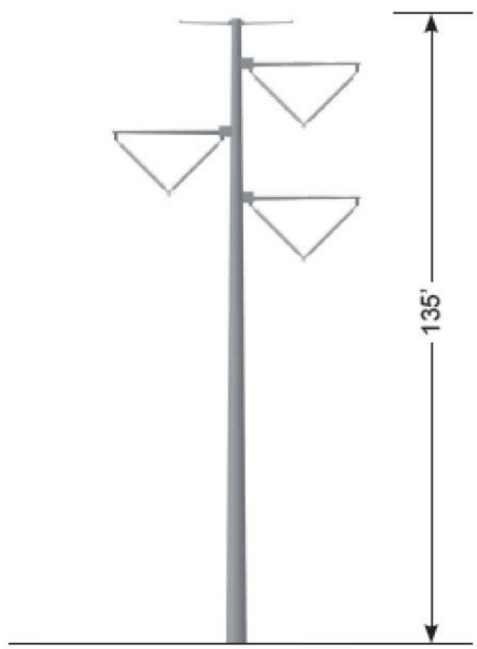


Figure 1-12: Typical Single Circuit Monopole Self-Supporting Tower

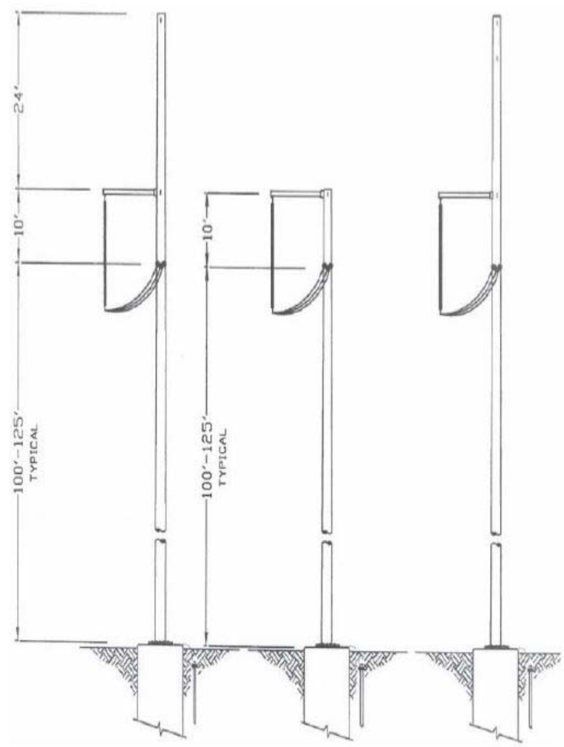


Figure 1-13: Typical Self-Supporting Tubular Angle/Crossing Tower

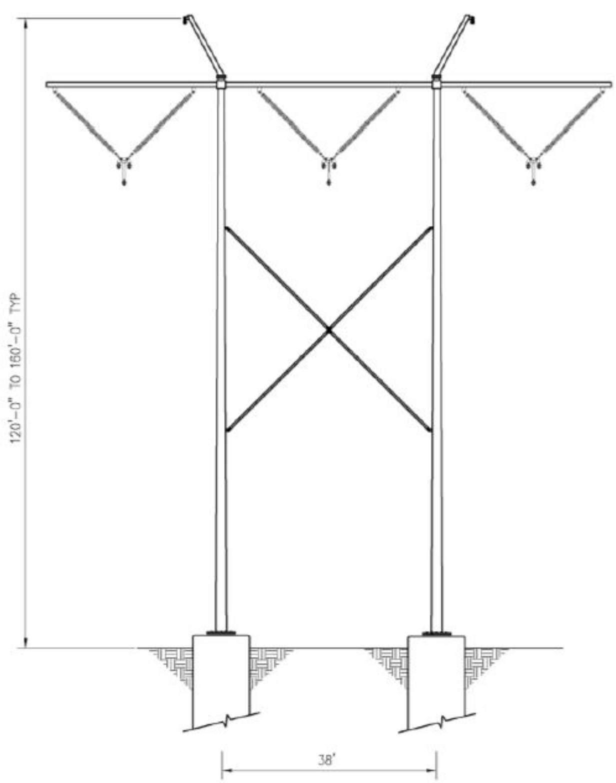


Figure 1-14: Typical Single Circuit H-Frame Tower

Guyed-V transmission structures will either be tubular or lattice steel with four supporting guy anchors. The foundation for the guyed-V structures will be precast spread footings or concrete drilled piers. The precast footings will be approximately 6.5 feet square and 4.75 feet deep. The concrete drilled piers will be approximately 4 feet in diameter and range from 8 to 30 feet in depth. Each guy anchor will be a grouted earth anchor, with a diameter of less than a foot and ranging in depth from 10 to 60 feet. The grout used with the anchors is similar to concrete. Guy anchors may alternatively consist of concrete drilled piers that are approximately 2 – 4 feet in diameter and 8 to 20 feet in depth

Self-supporting steel-lattice transmission structures will require four footings. The foundations for the steel-lattice towers will be cast-in-place concrete approximately 3 to 5 feet in diameter with a 15- to 20-foot depth.

Self-supporting steel pole transmission structures (three single poles for turning structures, as illustrated on Figure 1-7) have three poles and require one footing for each pole. H-frame structures (as illustrated on Figure 1-14) require two footings. Self-supporting tubular-steel structures will be installed on a single pier with anchor-bolt foundations or directly imbedded into the foundation. Foundations for these structures will typically be 6 to 10 feet in diameter and 25 to 55 feet in depth.

The conductor for the 500 kV circuit would consist of three phases, with a three-conductor bundle for each phase. Spacing between subconductors in a bundle would be approximately 18 inches. Aluminum-trapezoidal or aluminum-stranded nonspecular conductors with a steel-stranded reinforced core would be used. The aluminum carries the majority of the electrical current, and the steel provides tensile strength to support the aluminum strands. Minimum conductor height above the ground for the 500 kV lines would be 31 feet at 212 degrees Fahrenheit in accordance with the National Electric Safety Code ("NESC"). The exact height of each tower would be governed by topography and safety requirements for conductor clearance. Alternate materials or designs may be selected to optimize efficiency, reliability, and/or economics.

Three assemblies of insulators in the form of a "V" or "I" would be used to position and support each of the conductor bundles, while maintaining electrical design clearances between the conductors and the tower. Typically, "V" form insulators will be used for typical 500 kV tangent tower structures, while "I" form insulators will be used for 500 kV dead-end tower structures. Some towers may use a combination of both insulator forms.

To protect the 500 kV transmission line from direct lightning strikes, two overhead ground wires, approximately ½-inch in diameter, would be installed on the top of the structures. It is likely that a fiber optic line will be integrated with one of these overhead ground wires. Current from lightning strikes would be transferred through the ground wires and structures into the ground.

Ground rods will be installed next to the structure foundations to prevent a lightning strike from damaging the overhead conductors. After the ground rods have been installed, the grounding will be tested to determine the resistance to ground. If the measurements indicate a high resistance, counterpoise will be installed, which will consist of trenching in-ground wire with a ground rod driven at the end. The counterpoise will be contained within the limits of the transmission line or adjacent access road right-of-way, and may be altered or doubled back-and-forth to meet the requirements of the Project.

Interconnecting Substation: The 500 kV transmission line will interconnect with the existing Midpoint Substation operated by Idaho Power Company or an alternative new switchyard located along the SWIP-North alignment. The interconnection of the Project to the existing substation will require the addition of facilities such as addition of circuit breakers, busing, motor operated disconnect switches, additional relay panels in the existing control enclosures, various auxiliary substation equipment, and other electrical equipment. The scope of the additional equipment required for interconnection will be determined through electrical system impact and facilities studies. Interconnection of the Project to an alternative new switchyard along the SWIP-North alignment would require the construction of a facility similar to the 230/500 kV substation depicted in Figure 1-8, minus the voltage transformers.

Battery Energy Storage System: MVE is proposing to incorporate a battery energy storage system adjacent to an onsite project substation. The storage system will consist of racks of electrochemical batteries in a warehouse type building (resembling a data center; approximately 30 feet tall), AC/DC power conversion and electrical control equipment, electrical distribution and transmission facilities, communications equipment, operations and maintenance facilities, and other ancillary facilities. These facilities would encumber approximately up to 40 acres adjacent to the onsite 230/500 kV substation. The capacity of the battery energy storage system will be determined in the final design phase, once a specific turbine is selected and commercial contracts for Project power are finalized. Forty acres will support the deployment of a battery energy storage system with thousands of megawatt-hours of storage potential.

1.3.7 Ancillary Facilities, Access Roads, Buildings, and Parking Areas

Access Roads: See the Road Design, Traffic and Transportation Plan attached as Appendix J to the POD.

Communication Facilities: A high-speed communication system is required for operation of the wind turbines, substations, transmission lines, battery energy storage system, and other Project facilities. Fiber optic lines will provide the primary communication pathway throughout the Project, and will most often be incorporated into the design of the collector and transmission lines. These communication pathways will be used for voice and data communication, protective relay telemetering, and supervisory control and data acquisition. While MVE is not seeking to conduct or lease commercial telecommunication services at this time, the system will be designed to accommodate such requests. A redundant communications method may also be employed using microwave systems.

Operations and Maintenance (O&M) Buildings: The Project will include one or more O&M buildings to serve as office space, operations center, and maintenance shops/warehouses. The office portion of the building will house facility staff and include facilities common to a business office such as a conference room, offices, break room, and restrooms. A control room, where facility staff monitor and control operation of the facility will also be located in this building. The facilities will also include maintenance shops and warehouses where staff can bring equipment for testing, repairs or maintenance.

Common ancillary features for the O&M facilities include staff parking areas, distribution power source, potable water source such as an onsite well or water line to an existing water source, septic system, and communication facilities. O&M staff necessary to operate the Project typically access the O&M facilities daily. Additional information can be found in Section 4.3.

Intermodal Yard: Given the proximity of the Union Pacific rail line to the Project area, efficiencies in turbine component delivery could be realized by transporting these parts to the Project via rail. A number of existing sidings in the Project vicinity are being explored for use as intermodal yards where components delivered by rail are transferred to semi-trailers to complete the delivery to a construction staging yard or individual work area.

Meteorological Towers: Multiple permanent meteorological towers will be placed in the Project area to monitor the weather conditions and inform efficient operation of the wind turbines. Additional information can be found in Section 3.2.

1.3.8 Temporary Construction Workspace, Yards, and Staging Areas

Secure laydown and construction staging areas (up to 50 acres per area) will be established in the vicinity of the Project area as necessary to support construction logistics and activities. These areas will be used to receive and stage Project components and construction equipment, and serve as an assembling location for construction workers. The areas will include temporary construction offices and support facilities such as a portable toilet trailer and a portable amenities trailer. These temporary construction areas may also serve as the location of mobile concrete batch plants.

The location of the proposed staging areas will be strategically selected in an effort to avoid environmentally and culturally sensitive areas. Previously developed sites on non-federal lands in the Project vicinity may be considered as well. The temporary construction areas will be established in areas that are relatively flat and close to a primary access point for the Project. This would provide efficient access for materials and equipment being delivered to the staging area and disbursement to the active work sites.

1.3.9 Water Usage, Amounts, and Sources

Water will be needed for dust control, batching water for concrete production, and other washing needs (such as washing trucks, hydrating aggregate, etc.).

MVE estimates for civil scopes – including hydration/compaction, backfill, cement stabilization, and dust control – that around 60-90 million gallons of water will be required. In addition to the civil scopes, MVE expects to use approximately 36 gallons of water per yard of concrete that is batched for the wind turbine foundations. This equates to approximately 21,600 gallons of water per wind turbine foundation. The actual amount of water utilized during construction will depend on final design.

The water needs for the Project are expected to be served through a combination of existing commercial sources and new groundwater wells. Up to six (6) new groundwater wells are anticipated to support construction activities, four (4) of which may remain active to support operation and maintenance of the Project. The new groundwater wells will be located within or in close proximity to the proposed laydown yards and O&M facilities. Water will be stored in onsite tanks or ponds in sufficient quantities to support usage rates during peak periods. Water quality will determine the need for associated water treatment equipment to support potable use during the operations phase.

Water may also be trucked into the Project area from commercial sources in the region. Potential sources include canal companies, adjacent landowners, municipalities, or other commercial sources.

During construction, mobile water tank stands, frac tanks, or similar water storage devices may be strategically deployed throughout the project area to support proximate construction activities. Above or belowground water lines may also be deployed adjacent to access roads to assist with the conveyance of water to strategist use points. Select locations of water storage tanks and water lines placed adjacent to roads may be maintained throughout the operations period to assist with ongoing road maintenance, provide water access points to serve as a resource for potential wildland fire suppression activities (refilling rangeland firetrucks or helicopter dip-tanks), and potentially offer value as a supplemental water source to mitigate potential impacts to public land grazing operations.

1.3.10 Erosion Control and Stormwater Drainage

Prior to construction, a Storm Water Pollution Prevention Plan (“SWPPP”) will be developed for implementation during construction. The SWPPP would include structural and non-structural best management practices (“BMP’s”) for erosion and sediment control as well as a monitoring and corrective action plans, as necessary.

1.3.11 Vegetation Treatment, Weed Management, and Any Proposed Use of Herbicides

A vegetation treatment and weed management plan, including any proposed use of herbicides will be fully described in the Final Plan of Development and incorporate any mitigation measures prescribed as a result of the environmental review process.

1.3.12 Waste and Hazardous Materials Management

See the Hazardous Materials Management Plan within Appendix F (Health and Safety Plan) of the POD.

1.3.13 Fire Protection

See the Fire Protection and Prevention Plan within Appendix F (Health and Safety Plan) of the POD.

1.3.14 Site Security and Fencing

MVE will post safety and warning signs informing the public of construction activities where roads enter the Project area from a public road. During construction, general public access to active work zones will be monitored and controlled to prevent public access during such times when it would not be safe for public on-road or off-road use. If theft or vandalism becomes an issue during non-construction hours, a security guard will patrol the Project area to prevent or minimize the threat of those incidents.

Restricted access will be limited to short durations on access roads, or longer durations at discrete work areas. Examples of a short-term road access restriction includes during the transport of oversize loads, blasting activities, turbine erection activities near existing roads, and during the stringing of electrical conductor across or above roadways. Examples of longer duration access restrictions include work areas with open trenches or excavations, and laydown yards. These types of access restrictions will be coordinated with existing authorized right-holders within the Project area.

Gates to fenced areas, including the substations, switchyard, select lay down yards, and O&M area, will be locked at night or during non-construction hours. Gates or cattle guards will be installed where openings are needed along range fences. Temporary warning fences or barricades (consisting of warning tape, barricades, plastic mesh, and/or warning signs) will be erected in areas where public safety risks could exist and where site personnel would not be available to control public access (such as excavated foundation holes and electrical collection system trenches). Fences may be installed around laydown areas, areas deemed hazardous, or areas where security or theft are of concern, and would be removed at the completion of the construction period. A permanent chain-link fence will be installed around the Project O&M facilities and substations for safety. Temporary fencing around unfinished turbine bases will be designed to warn people of the potential danger. Excavations will be fenced with high visibility plastic mesh.

1.3.15 Spill Prevention and Containment

See the Spill Prevention, Containment, and Control Plan (“SPCC”) attached as Appendix G to the POD.

1.4 Alternatives Considered by Applicant

See Alternatives Considered attached as Appendix C to the POD.

1.5 Other Federal, State, and Local Agency Permit Requirements

Table 1-3: Federal, State, and Local Permits

Action Requiring Permit, Approval, or Review	Permit/Approval	Accepting Authority/ Approving/Consulting Agency	Statutory/Regulatory Reference
FEDERAL			
Right-of-Way over Land Under Federal Management	Right-of-Way Grant	BLM	Federal Land Policy and Management Act (FLPMA) 43 USC 1761-1771 and 43 CFR Part 2800
NEPA Compliance to Grant Right-of-Way	Environmental Assessment or Environmental Impact Statement	BLM	National Environmental Policy Act (NEPA), 42 USC 4321-4327, Council on Environmental Quality (CEQ) 40 CFR Part 1500
BLM Grant of Right-of-Way	National Historic Preservation Act Compliance	Idaho State Historic Preservation Office	National Historic Preservation Act of 1966 (NHPA), 16 USC 47 (Section 106), 36 CFR Part 800,
Impact to Bald or Golden Eagles	Eagle Take Permit	U.S. Fish and Wildlife Service (USFWS)	Bald and Golden Eagle Act, 16 USC 668 et seq
Dredge or fill activities in waters of the United States	Clean Water Act Section 404 Permit	U.S. Army Corps of Engineers (ACOE)	Clean Water Act, 33 USC 1344 (Section 404)
Any construction exceeding 200 feet above ground level	FAA Determination	Federal Aviation Administration (FAA)	14 CFR Part 77
STATE OF IDAHO			
Operation of a Concrete Batch Plant	Permit to Construct	Idaho Department of Environmental Quality	IDAPA 50.01.01
Impacts to water quality associated with discharges of dredged or fill materials in waters of the United States	401 Water Quality Certification, Clean Water Act	Idaho Department of Environmental Quality	33 USC 1344

Action Requiring Permit, Approval, or Review	Permit/Approval	Accepting Authority/ Approving/Consulting Agency	Statutory/Regulatory Reference
Construction activities that result in the discharge of stormwater	Compliance with Stormwater General Permit	Idaho Department of Environmental Quality	40 CFR Section 122.26(b)(14); IDAPA 58.01.25
Crossing state or U.S. highways	Encroachment Permit	Idaho Department of Transportation (IDT)	IDAPA 39.03.42
Oversize / overweight loads	Oversize / overweight Permit	Idaho Department of Transportation (IDT)	IDAPA 39.03.04; IDAPA 39.04.05; IDAPA 39.03.06
Right-of-way or easement on State Lands	Right-of-Way or Easement	Idaho Department of Lands	I.C. Sec. 58-603; IDAPA 20.03.08
LOCAL			
Construction of Building	Building Permit	Jerome County	Jerome County Code
Construction of Building	Building Permit	Lincoln County	Lincoln County Code
Construction of Building	Building Permit	Minidoka County	Minidoka County Code
Crossing of Highway District Roadway	License or Permit to Cross Road Easements or Rights-of-Way	Jerome Highway District	I.C. Sec 40-1310
Crossing of Highway District Roadway	License or Permit to Cross Road Easements or Rights-of-Way	Shoshone Highway District #2	I.C. Sec 40-1310
Crossing of Highway District Roadway	License or Permit to Cross Road Easements or Rights-of-Way	Dietrich Highway District	I.C. Sec 40-1310
Crossing of Highway District Roadway	License or Permit to Cross Road Easements or Rights-of-Way	Minidoka Highway District	I.C. Sec 40-1310

1.6 Financial and Technical Capability of Applicant

Magic Valley Energy, LLC is a Delaware limited liability company that is wholly owned by affiliates of the LS Power group of companies. Founded in 1990, LS Power is a privately held development, investment and operating company focused on power generation, energy infrastructure and related investments. Since its inception, LS Power affiliates have developed, constructed, managed and acquired more than 45,000 MW of competitive power generation and over 660 miles of transmission infrastructure.

LS Power is in a strong financial position and well positioned to meet the financial obligations of its projects. LS Power's financial position has long been considered one of its strengths, and it is highly respected within the financial community. LS Power has raised more than $47 billion in debt and equity for project financing, acquisitions or investment purposes all within the power sector. The common feature of all these financings is that a subsidiary created by LS Power raises the capital required to construct, acquire, and/or operate a power-related business, with equity support and asset management services provided by LS Power. Every LS Power sponsored project that has been taken to the financing community has been successfully financed.

Each LS Power developed project has been financed on the basis of a strong structure that includes project permits, real estate rights, and project documents such as long-term off-take contracts. As a result of this approach, LS Power has delivered on every power purchase agreement it has signed. LS Power has successfully developed many power generation facilities throughout the United States and been able to satisfy the credit requirements of numerous investor owned utilities, municipal utilities and electric cooperatives.

LS Power employs an integrated, multi-disciplinary approach, with a team of over 250 people covering every area of expertise required to successfully execute in the sector. Additionally, its projects have created thousands of construction and operations jobs in communities throughout the U.S.

2.0 CONSTRUCTION OF FACILITIES

The proposed design and layout of the Project components are described in detail above in Section 1.c. Information regarding the installation, construction process, timing, and sequence of construction activities is provided in the following subsections.

2.1 Laydown/Staging Areas

The temporary construction yards (up to 50 acres per area) will be established within or near the project area to support construction activities. These temporary staging areas may be located on BLM or non-federal lands. Each laydown yard may be used for temporary construction offices and support facilities (e.g., portable toilet trailer, portable amenities trailer), a staging area for the receipt and temporary storage of project infrastructure components (e.g. turbine components, transmission structures, electrical conductor, etc.), staging of construction vehicles and equipment, and potentially space for one or more mobile concrete batch plants. A typical construction laydown area is shown in Figure 2-1.

Figure 2-1: Typical Construction Laydown Area

The location of the proposed staging areas would be strategically selected in an effort to avoid environmentally and culturally sensitive areas. The temporary construction yards would be established in areas that are relatively flat with good access to area highways, and relatively close to interior Project roads. This would provide efficient access for materials and equipment being delivered to the staging area for disbursement to the proposed turbine sites.

If necessary, the temporary laydown areas will be leveled using civil equipment and capped with gravel or other appropriate material to form an acceptable work surface.

2.2 Geotechnical Studies

A detailed geotechnical investigation will be conducted and may include standard penetration test borings and other geotechnical testing methods at proposed turbine sites, substations, collector and transmission system routes, access roads, and other Project facilities to visually characterize the soils and to obtain samples for laboratory testing. In-situ electrical resistivity tests and bulk samples for thermal resistivity testing may be performed at some of the turbine boring sites and at the proposed substation locations. All test pits and soil boring locations will be back-filled after the soil samples are obtained per industry practice and in compliance with applicable regulations.

2.3 Phased Projects, Approach to Construction and Operation

The Project is being proposed with the flexibility such that the entire development may be constructed in a single phase or divided into two or more individual phases that each entail a portion of the overall proposal. The amount of generating capacity sought by creditworthy counterparties, the structure of the resulting commercial agreements, and the results of interconnection studies will determine the size and timing of an individual Project phase.

If the Project is constructed in more than one phase, the design of Project infrastructure such as substations will accommodate the ability for expansion during successive construction phases while relying on previously developed components such as access roads, operations and maintenance facilities, and communication networks. Certain construction related Project features such as staging and laydown yards, batch plants, and water sources would likely be reestablished in the same manner and location as during prior phases.

2.4 Access and Transportation System, Component Delivery, and Worker Access

See the Road Design, Traffic and Transportation Plan attached as Appendix J to the POD.

2.5 Construction Work Force Numbers, Vehicles, Equipment, and Timeframes

The workforce required to build the Project will be made up of a wide array of skillsets, including heavy civil work, iron work, concrete batching and placement, large mechanical assembly, crane work, electricians, and more. Some skillsets may be available locally or regionally, and MVE will direct the construction contractor to seek local skilled workers as available. If not available locally, workers experienced in the specific trades required for wind energy project construction will temporarily relocate to the region during construction. The number of construction personnel on site is expected to range from 400 to 850 during peak construction.

Construction traffic would be predominantly during weekdays, but some weekend and evening work may be required during peak construction periods. Most work done at night would be due to schedule constraints or would be to take advantage of favorable weather conditions. Specific lighting equipment to facilitate nighttime construction will vary by contractor and activity. Tow behind mobile light plants are an example of what is expected to be used.

The following equipment list represents what is typically needed for a scope similar to the Project.

Pickup trucks – as required based on manpower counts.

Access Roads:
- Forklifts
- Flatbeds
- RT Cranes
- Dozers
- Compaction equipment
- Belly dumps
- Excavators
- Motor graders
- Scrapers
- Tractors
- Water trucks
- Loaders

Foundations:
- Excavators
- Dozers
- Compaction equipment
- Concrete trucks
- Flatbed trucks
- Loaders
- RT Cranes
- Concrete telebelts
- Forklifts

WTG Erection:
- Forklifts
- Flatbeds
- RT Cranes
- Crawler cranes
- Dozers
- Compaction equipment

Collection:
- Trenchers
- Dozers
- Motor grader
- Tractor and Reel Rigs
- Backhoe
- Conveyor Truck

- Wheel Loader

230 kV Transmission Lines:

- Texoma Drill Rigs
- Reel trailers with tractors
- Hydraulic Tensioning Trailers
- Pitman Pole Rigs
- Hi Ranger Bucket Trucks
- Pole Trailers with Tractors
- Lead Line Trucks
- Concrete Trucks

500 kV Transmission Lines:

- Texoma Drill Rigs
- Reel trailers with tractors
- Hydraulic Tensioning Trailers
- Pitman Pole Rigs
- Hi Ranger Bucket Trucks
- Pole Trailers with Tractors
- Lead Line Trucks
- Concrete Trucks

Substation:

- Dozers
- Excavators
- Drill rigs
- Bucket trucks
- Manlifts
- RT Cranes
- Skidloaders

2.6 Site Preparation, Vegetation Removal, and Treatment

Prior to the commencement of major ground disturbing activities, land survey crews will perform surveys and stake/flag the location of Project facilities, the approved extents of disturbance, any environmentally sensitive areas to be avoided during construction, and other locations or alignments as appropriate. Environmental resource specialists will participate in locating and flagging any sensitive environmental areas that require flagging or fencing. Specific flagging and staking procedures will be established per the Flagging, Fencing, and Signage Plan (see Appendix K). Flagging will be maintained until final clean-up and/or reclamation is completed, after which they will be removed.

Signs, flags, and/or fencing will be used to delineate and protect sensitive environmental resources in the vicinity of construction activities. A system of standardized and simplified exclusion markings will be used to reduce potential confusion during construction, and to minimize the risk of highlighting types of sensitive resources that could be targeted by vandals (e.g., if exclusions around archaeological sites were marked differently than those around sensitive natural resource areas, the sites would be at a higher risk of unauthorized artifact collecting or other disturbance).

The aerial limits of construction activities will be predetermined. Standard survey flags and stakes will be installed before the start of Project construction. Project work sites will be marked by the construction contractor. Designated Project access roads, spur roads, parking areas, and pullout areas will be marked to facilitate travel throughout the Project Area.

2.7 Site Clearing, Grading, and Excavation

Site clearing and grading activities will be required on nearly all active Project work areas. Large civil equipment such as bulldozers, scrapers, excavators, and motor graders are typically used to clear and level access roads and work areas to achieve a desired gradient. In temporary disturbance areas, topsoil bearing organic components would be windrowed at the edge of work areas for use during the reclamation phase, in accordance with the Project's Reclamation Plan (see Appendix E). Excavated waste rock and/or mineral soil underlying the topsoil may be used where possible for fill material anywhere within the Project area (such as to achieve desired grades or extend road radii). Excavations will be necessary for the foundations of Project components such as wind turbines, transmission structures, substation equipment, O&M facilities, and the battery energy storage facilities. It may be necessary to blast rock to achieve the necessary slope and gradient for interior roads or for foundation construction.

Blasting will likely be required to support clearing, grading, and excavation activities in areas with shallow bedrock. All blasting would be conducted in accordance with a Blasting Plan (see Appendix I). The Blasting Plan establishes the appropriate safety protocols for the handling and use of explosives in the Project area. Procedures identified by the construction contractor for conducting such work, as well as applicable Federal and state regulations, would be followed. Explosive material would be handled only by a licensed, state-approved contractor that would have full responsibility for control and use of the material.

Sediment and erosion control measures would be implemented as grading activities progress throughout the Project in accordance with the Best Management Practices found in the Project's Stormwater Pollution Prevention Plan ("SWPPP"). Areas to be cleared and graded include access roads, laydown areas, turbine and transmission structure locations, substations, and other facility work areas. Clearing would be performed only within the approved limits of disturbance or for fire prevention and fuel management. MVE will provide the locations of these clearings in advance.

2.8 Gravel, Aggregate, and Concrete

Construction of the Project will require gravel and aggregate for use as road base, development of turbine work areas, substation surfacing material, and other potential uses. In addition, mineral materials will be required to batch concrete for Project foundations. Temporary concrete batch plants will likely be established within the Project laydown yards for preparing and mixing the concrete used for foundations of wind turbines, substation equipment, transmission structures, the operations and maintenance buildings, and other necessary project facilities. Local concrete suppliers may also be used to provide truck deliveries of concrete. The batch plant complexes consist of a mixing plant, areas for sand and aggregate stockpiles, an access road, and truck load-out and turnaround areas. The batch plants themselves consist of cement storage silos, water and mixture tanks, aggregate hoppers, and conveyors to deliver different materials. The batch plants will be located within Project laydown yards or in separate temporary batch yards close to the sites where foundations are being poured. The batch plants will be relocated as needed to maintain an efficient operation.

Preliminary geotechnical investigations will inform whether the aggregate generated from onsite grading and excavation activities is appropriate for reuse as road base material in the Project area or as substrate for batching concrete. 43 CFR 2805.14 permits this use of common varieties of stone and soil which are necessarily removed during construction of the Project (without additional authorization or payment) within the authorized right-of-way. In the event the material is not suitable for batching concrete, other commercial sources in the region will be used to fulfill Project needs.

2.9 Wind Turbines

The assembly and erection of the Project wind turbines will represent the most dynamic stage of the construction phase. Wind turbine construction involves multiple work crews performing a number of sequential tasks that proceed from turbine location to turbine location as efficiently as possible. MVE anticipates that construction crews will need to utilize a 300-foot radius work area around each turbine to perform the installation.

Foundations: The wind turbine foundation anchors the turbine structure securely to the ground due to its size, weight, and configuration. The most common foundation design used for wind turbine installations within the United States is the inverted T spread footing foundation. An inverted T foundation is typically an octagon shape with dimensions ranging from 50 to 75 feet wide and 8 to 12 feet deep and a concrete pedestal up to 20 feet in diameter with anchor bolts that protrude for attachment of the tower. Typically, the amount of soil material excavated for a mat foundation ranges between 655 to 1,045 cubic yards; much of the excavated soil is typically reused to backfill over the concrete foundation and to perform the final grading around the turbine erection area or project roads. The amount of concrete material needed to construct a typical foundation ranges from 375 to 600 cubic yards. Rebar is used for structural support with about two to three truckloads of steel (20 to 50 tons) used per turbine site.

In the event of hard subgrade material, such as the basalt expected throughout the Project area, concrete and rebar material may be reduced, but additional labor will be required to remove native material by more intensive means such as drilling and blasting. If the quality of the material is not sufficient for backfill or final grading, additional material would be imported to the site or borrowed from other excavations on the site. If the material is not sufficient for backfill or final grading, it would be disbursed within the ROW and reclaimed.

After the concrete has cured, the excavated soil is backfilled so that only the concrete pier with anchor bolts on top of the mat remains visible. Topsoil would be reserved for rehabilitation and other excess soil from construction activities would be used where needed to achieve an appropriate grade, to supplement the existing sub-base of roads, and/or to blend the road into the surroundings grades by widening curves and improving road prisms, as appropriate. See Figure 2-2, Figure 2-3, and Figure 2-4 for a turbine foundation under construction, a complete turbine mat after curing, and a backfilled mat with only the concrete pier visible, respectively.

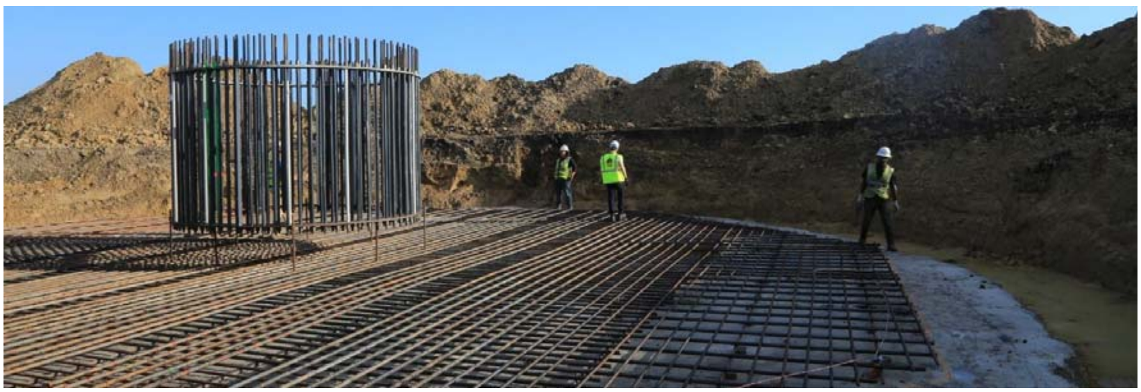


Figure 2-2: Turbine Foundation Under Construction

Figure 2-3: Complete Turbine Mat

Figure 2-4: Backfilled Turbine Mat

Turbine Component Delivery: With the wind turbine pad and foundation complete, the site is ready for off-loading of the turbine components. Each turbine component will be delivered to the turbine pad on a semi-tractor and trailer configured to accommodate the length and weight of the component. Each site will receive three to four tower sections (dependent upon the turbine manufacturer), three blades, one hub, one nacelle, two to four electrical components (such as down-tower assemblies, pad-mounted transformers, or switchgear), and crates of bolts and other components. The typical equipment used to off-load these components consists of rough terrain cranes, forklifts and a crawler crane. Typically, Schnabel trailers are used to deliver tower sections and are capable of lowering the towers onto dunnage without the use of additional equipment. Rough terrain cranes are used to off-load the blades by performing tandem picks at each end of the component. The hub is off-loaded using a single rough terrain crane. Depending on the weight and configuration of the nacelle, a crawler crane may be required to off-load the nacelle. The forklifts are used to place dunnage under the turbine components to keep them off the ground and stored in a secure manner prior to their erection. All of the components are placed within the turbine pad adjacent to the crane pad such that they are within the picking radius of the various cranes that will be used to erect that component. The typical process of unloading consists of the delivery truck pulling into the pre-determined position near the crane pad, the crane(s) then position next to the component and the rigging is attached to the component and the crane(s). The component is then lifted off the delivery truck, the truck pulls forward, the forklifts set the dunnage under the component and the crane(s) lower the component onto the dunnage. This process repeats until every turbine component is off-loaded (see Figure 2-5).

Figure 2-5: Typical Unloading of Turbine Components

<u>Tower Erection and Assembly:</u> After all the turbine components have been off-loaded, the site is ready to begin erection of the tower base and mid (or lower-mid for a 4 segment tower) sections. Prior to any cranes arriving at the site, a forklift often places wooden crane mats on the crane pad (see Figure 2-6). This is done to support the crawler crane during its erection activities. The erection of the base and mid-sections is typically performed by a 200 to 300 ton crawler crane. The crawler crane walks itself onto the crane pad and mats that are adjacent to the foundation and staged turbine components. The crawler crane is accompanied by a smaller rough terrain “helper” crane that assists in lifting the tower sections from the ground to a vertical position if a “tipping shoe” is not used to stand the tower section. A forklift assists with moving dunnage and crane mats during the operation.

Figure 2-6: Crane Pad and Mats

The base tower section is prepared by placing the required rigging at each end of the tower. The crawler crane and helper crane hook onto the rigging and jointly lift the base tower section. The tower section is lifted to a vertical position and placed on crane mats to allow the rigging on the bottom of the tower to be removed. The crawler crane then lifts the tower section and it is placed on the anchor bolts that were left extended on the foundation pedestal. The base section is then leveled and bolted to the anchor bolt cage. The mid section is placed in the same manner and bolted to the base section of the tower. The contractor then places grout under the tower to form the final connection between the tower and foundation. An erected base tower section can be seen in Figure 2-7.

Figure 2-7: Erected Base Tower Section

After successfully erecting the base and mid sections and allowing sufficient time for the grout to set up, the next tower section (mid or top) is lifted and placed onto the tower base in a manner similar to that described above (see Figure 2-8). The two tower sections are then bolted together prior to the crane being released. Upon completion of the tower erection, the crawler crane then walks to the next site to perform the same operation. Some construction contractors may utilize slightly different sequencing for tower assembly and grouting, or save final tower section placement until the main erection crane arrives at that location.

Figure 2-8: Mid Tower Section Placement

Following installation of the turbine tower, the rotor must be built. Certain turbine manufacturers allow the assembly of the rotor on the ground and then the erection of the complete rotor by the main erection crane (see Figure 2-9). When completed in this manner, the rotor assembly typically consists of a 100 to 200 ton crawler crane and a forklift to assist its operation. The crawler crane lifts each blade and positions it into the opening in the hub. The crew bolts the blade to the hub and positions dunnage under the blade to support it. The crawler crane continues to lift and place the remaining blades on the hub until the rotor is complete. The crews tie down the assembled rotor to prevent it from moving until it is ready for erection. Upon completion of assembling the rotor, the crawler crane and forklift walk to the next site and repeat this operation.

Figure 2-9: Erection of Complete Rotor

The main erection crane is the next crawler crane to visit the turbine site. The main erection crane is typically a 400 to 600 ton crawler crane. Its purpose is to erect the remaining upper tower section(s), nacelle and hub. The main erection crane is assisted by a rough terrain “helper” crane and forklifts. The main erection crane walks onto the crane pad and mats to perform the erection activities. Similar to the installation of the base and mid-sections described above, the main erection crane and helper crane hook rigging onto each end of the upper tower section(s) and lift them to a vertical position (or the tower is tipped upright using the tipping shoe), the bottom rigging is then removed and the tower section is placed on those sections already assembled. Once all the tower sections have been erected and bolted together, the main erection crane will then be rigged to a beam that allows the nacelle to be lifted. The main erection crane will lift and position the nacelle over the top tower section's flange to allow it to be bolted together. The next step is to lift the assembled rotor and attach it to the nacelle. The crawler crane and helper crane lift the rotor together until it reaches a vertical position, at which time the rigging for the helper crane is removed. The crawler crane lifts and positions the rotor so that the bolt holes align with the nacelle and the two components fasten together. After the rotor is securely attached to the nacelle, the main erection crane removes its rigging from the rotor and walks to the next turbine site to repeat this operation.

Given the size and complexity of the large crawler cranes, efficient travel from one turbine pad to the next, and form once turbine string to the next is an important factor in the construction timeline.

To minimize back-tracking down dead-end roads, temporary overland crane paths will be utilized to the extent practical. These travel pathways may require matting across softer soils or minor civil work on rock outcroppings to support their intended use.

While MVE expects to assemble the rotor on the ground and perform one lift to place it, there are certain turbine manufacturers that do not permit the rotor to be assembled on the ground. These manufacturers require that each individual blade be attached to the hub after it is erected. In this case, the turbine site maybe visited by another crawler crane after the main erection crane has erected the nacelle and hub. It has not yet been determined if all main erection will be performed by a single crane at each site. The typical crane used for attaching the blades is a 200 to 300 ton crawler crane. It is typically assisted by a forklift. The crane attaches to a beam specifically designed to lift each individual blade up to the hub (see Figure 2-10). The crane lifts the blade and positions it so that the bolts align with the opening in the hub and it is inserted and bolted securely. The crew in the turbine then rotates the hub in order to properly position it for the next blade. The crane then attaches to the next blade and repeats the procedure. After all three blades are securely fasted to the hub the crawler crane walks to the next site to repeat the operation.

Figure 2-10: Crane Lifting Blade to the Hub

Once the major components of the wind turbine are assembled, work is done internally to connect the generation equipment in the nacelle with drop cables in the tower and the control system in the base. All mechanical connections are secured and checked. When these activities are completed, generally over the course of two to four days, the turbine has achieved a state of mechanical completion and is ready for commissioning.

It is important to note that the procedure described above is general. Wind turbine manufacturers may have very specific procedures that differ somewhat from those described for each turbine model. The installation procedures for all current commercial turbine models are similar, however, and MVE does not expect significant deviation from the above procedures. Additionally, as the wind turbine technology progresses into larger and larger turbine sizes, the need arises for larger cranes. Based on current turbines under consideration, MVE anticipates needing a crane that is up to 45 feet wide, 150 feet long, and weighs up to 1000 tons.

2.10 Electrical

Collector Lines: Power from the turbines would be fed through insulated electric cables and a breaker panel at the turbine base inside the tower would be connected to a pad-mounted step-up transformer. The specific placement of these facilities within the tower area is dependent upon the turbine manufacturer selected by MVE. Some turbine models have the transformer in the nacelle of the turbine which would remove the need for a pad-mounted transformer. For turbine models with a pad-mounted transformer, the 34.5-kV transformer is approximately 6 feet long by 6 feet wide and 6 feet high, and is typically placed on a concrete pad or manufactured oil containment box pad adjacent to the new turbine foundation. The transformer steps up the voltage from the wind turbine (typically around 690 volts) to 34.5 kV, which is the typical voltage carried on the electrical collection system. Each pad-mounted transformer would contain approximately 500 gallons of mineral oil used to cool the electrical components located within the box. Leak detection and containment systems have been engineered into the design of these transformers. As a result, potential for accidental spills resulting from malfunction or breach of the transformers is low.

MVE expects to construct both underground and overhead electrical collection systems, depending on final design and terrain. MVE’s geotechnical investigations to date has revealed that the majority of the collection system will likely be overhead, however there may be areas of the project where terrain and economics will drive the usage of underground collection. Additionally, the overhead collector line must be setback from the turbines by a length equal to the turbine tip height (hub height plus blade length). The purpose of this is to protect the integrity of transmission network in the event of a catastrophic failure resulting in the turbine falling over. Due to this setback requirement, there will be an underground portion of collector that connects each individual turbine to the overhead portion of the collection system. The most efficient route for these underground portions would be a straight line. However, the exact routing will be influenced by site-specific conditions (geotechnical, topographic, other infrastructure, etc.). The overhead portion of the collection system would then carry the power from the turbines to a substation.

The installation of the overhead collection system involves the placement of electrical poles and the stringing of cables between the poles. MVE intends to use wooden poles where possible and light-duty steel as needed. A minimal amount of clearing and/or grading may be required to provide necessary access to the structure work areas.

Installation of the two types of poles used in the overhead collection system generally involves the following steps:

- **Pole Framing**. The components of the structures (poles, cross-arms, insulators, and hangers) are brought to the locations of their installation to be assembled. This work is typically performed on the ground just prior to erection of the structures.
- **Setting Direct Embedded Poles**. The medium-voltage wooden poles under consideration are often embedded into the ground without the use of a separate foundation. The construction process consists of first excavating the holes for the structure to the required depth. This can be accomplished through the use of a vertical drilling rig or excavator. Once the excavation for a structure is completed, the structure is hoisted into place by either a boom truck or all-terrain crane. The structure is checked for proper embedment depth, alignment and plumb. The structure is held in place while it is backfilled with either aggregate/rock or concrete. The backfill is mechanically vibrated or tamped in lifts to eliminate voids and assure proper bearing pressure. Guy wires are attached from the pole to ground anchors as necessary, depending on pole design and location. After the pole is backfilled, it is released.
- **Foundations**. In the event that some overhead collection system poles require a concrete foundation, e.g. steel poles, such foundations would be installed 3 to 5 weeks ahead of the structure erection to allow concrete to reach design strength. The foundation site is excavated, and frames placed onto excavated soil or a mudmat. Steel reinforcement is added within the frame, and concrete is poured. Once the concrete has reached sufficient strength, the forms are removed and the area backfilled. As an alternative, MVE may choose to utilize precast foundations based on the soil conditions and technical requirements. The surface disturbance of either foundation design is similar.

Once the pole installation is complete, stringing can begin. Stringing involves the pulling of the conductors through stringing dollies with wires/ropes. The use of guard structures will be required when crossing public roads. Guard structures are simply temporary wood structures or nets that prevent the pulling lines or conductor from falling onto the roadway.

The stringing dollies are attached to the insulators at the time of framing, and a rope line is looped down the structure to aid in the pulling of the stringing line. The line is pulled through the dollies from a tensioner to a dead end point on the line and attached to conductors located on a reel trailer. The puller then pulls the conductor though the dollies. When the desired span or reel length is reached, the reel end of the cable is placed into the dead end structures and the proper tension is applied.

Once the proper tension and sag is obtained, the cable is clipped into place. This process involves the removal of the stringing dollies and the installation of the cable clamps to firmly hold the conductor. The clipping process can be performed by bucket trucks.

For underground collection, the placement of collection cables into the ground can either be done with one-pass trenching machines, or by laying the cables into excavated trenches that are then backfilled. Initial geotechnical information indicates that the depth of rock is very shallow on the

Project Site, making it unlikely that the single-pass trenching machine method may be utilized. As such, the open trench method is described below.

For open-trench collection system installation, a separate trench would be utilized for each collection circuit. Typically, cables are suitable for direct burial and are buried at a depth of 2-4 feet below grade. Trenches would be excavated with a trenching machine or backhoe (see Figure 2-11); however, if competent rock is encountered at shallow depth, it would be necessary to jackhammer rock locally or drill and blast sections to open up a trench. If the rock content in local soil conditions is negligible, the collector cables and fiber-optic cables will be placed directly on the bottom of these trenches. The native material excavated from the trench will be sifted for rocks, backfilled on top of the cables, and compacted with a vibratory compactor. The excess material would be repurposed or reclaimed within the ROW. The backfill will be placed in lifts to achieve sufficient soil compaction and allow for the warning tape to be installed.

Figure 2-11: Typical Trenching with Trenching Machine

If the rock content in local soil conditions is high enough to cause risk of cable jacket damage during installation, bedding material (likely sifted backfill from elsewhere on the Project Site, or possibly engineered backfill from off-site) will be placed in the trench prior to installing the collector cables and fiber-optics. In such rocky conditions, it is also likely that the soil excavated from the trench will have too much rock content to be used to backfill the trench without damaging the cables. In those instances, an engineered backfill (soil with good thermal dissipation properties that is free of rocks) will be utilized to backfill the trench. Such backfill may be obtained from within the site, or imported from an off-site quarry or pit. As described above, the backfill will be placed into the trench in lifts for compaction and warning tape installation.

Geotechnical testing in the area around the cables will determine the heat dissipation properties of the soil. If necessary, the engineered backfill for the trenches may include material necessary to improve the overall thermal properties. Such material improvements would be determined in the detailed collection system design.

Where splices are necessary in collection system cables, above-ground splice boxes will be installed above the collection cable trench. Similarly, in locations where two or more sets of underground lines converge, pad mounted switch panels would be used to tie the lines together into one or more sets of larger feeder conductors. These above-ground boxes are commonly four to six feet across and four feet high, constructed of plastic and fiberglass material appropriate for medium-voltage connections, and colored green. MVE would install concrete bollards around the boxes to avoid accidental damage by Project vehicles.

Project Substations: Construction of the Project substations will occur concurrently with other activities across the site. Each substation site is cleared and graded to subgrade elevation per the requirements of the final design. Structural footings and underground utilities, along with electrical conduit and a grounding grid are installed, followed by aboveground structures and equipment. A chain-link fence is constructed around each new substation for security and to restrict unauthorized persons, livestock, and wildlife from entering the substation. The site is then finish graded and gravel surfaced, and reclamation is initiated outside the substation fence.

Substation control buildings will likely be prefabricated, and will be assembled or placed onto concrete slabs within the substations. Major equipment to be installed inside the control buildings consists of relays, control panels, servers, communication equipment, power supplies, a battery bank for back-up power, and a heating/cooling system.

Steel structures are erected on concrete footings to support switches, electrical buswork, instrument transformers, lightning arrestors, and other equipment, as well as termination structures for incoming and outgoing transmission lines. Per common utility practice, these structures are fabricated from tubular steel and galvanized. Structures are grounded by thermally welding one or more ground wires to each structure.

Major equipment will be set by crane and either bolted or welded to the foundations. Oil spill containment basins will be installed around major oil-filled transformers and other equipment. Smaller equipment, including switches, current and voltage instrument transformers, insulators, electrical buswork, and conductors will be mounted on the steel structures.

Control cables are pulled from panels in the control building, through the underground conduits and concrete trench system, to the appropriate equipment. After the cables are connected, the controls are set to the proper settings, and all equipment is tested before the substation and transmission line are energized.

Figure 2-12: Example Collection Substation

230 kV Transmission Lines: The installation of the 230 kV transmission lines is similar with respect to that of the overhead collection system, however the size of the equipment involved is significantly larger. Clearing and grading will be performed to provide safe access to the transmission line structure sites for construction activities.

Installation of wooden or reinforced concrete H-frame transmission structures is very similar to those of the wooden overhead collection system poles previously described.

Installation of monopole or lattice steel transmission structures with concrete foundations generally involves the following steps:

- **Foundations**. Transmission foundations are typically installed 3 to 5 weeks ahead of the structure erection to allow concrete to reach design strength. The foundation site is excavated, and frames placed onto excavated soil or a mud mat. Steel reinforcement is added within the frame, and concrete is poured. Once the concrete has reached sufficient strength, the forms are removed and the area backfilled.
- **Structure Framing**. The components of the structures (pole pieces, cross-arms, insulators, and hangers) are brought to the locations of their installation to be assembled. This work is typically performed on the ground prior to erection of the structures. At sites where terrain or environmental constraints don't allow for on-site assembly, the framing will be done at a nearby staging area.
- **Setting Base Plate Poles**. Once the concrete has reached sufficient strength and the structures are framed, the structures can be erected onto the foundations. This is commonly done by cranes or boom trucks. The structure is hoisted off the ground and then set onto the foundation. The structure is checked for alignment and plumb, and if necessary leveled by adding shims or adjusting leveling nuts. Any structures supported by guy wires (design and location dependent) are affixed to ground anchors. If required for the design, grouting is then added to the base of the tower and allowed sufficient time (generally 2 to 4 weeks) to cure.

It is possible for steel monopole transmission structures to be installed by direct embedment. This process would be similar to that of the overhead collection poles previously described.

Once the structure installation has been completed, the conductor is strung per the overhead collector system procedure previously discussed.

500 kV Transmission Line:

Work Area Clearing and Grading Activities: Temporary and permanent work areas are required to support safe construction and maintenance activities on the transmission right-of-way. At each tower location, construction crews will need a clear, level work area to install foundations and guy-anchors, where required for the individual structure type. If the existing terrain and vegetation at a structure location inhibit safe construction methods, a temporary work area of up to 200 feet by 200 feet will be cleared and leveled with heavy equipment to support construction activities. If the terrain is sufficiently level but vegetation hinders safe construction methods, the vegetation at the temporary work area may be mechanically cleared with a hydro ax or similar mowing equipment. Structure work areas in difficult terrain may require expansion of a given work area up to 250 feet in length within the ROW to accommodate safe construction methods. Towers may not necessarily be located in the center of a designated structure work area. Overland travel outside of the temporary work areas may be required by construction equipment for specific in-and-out tasks such as anchor installation, tower erection, and access to sleeve points. During Project restoration activities, temporary work areas at structure locations will be partially reclaimed leaving, where terrain allows, an approximately 100-foot by 100-foot permanent disturbance area for use during maintenance activities.

Temporary work areas will also be required at pull and tension sites and mid-span splice sites. These areas are required to install the transmission conductors as well as the OPGW and static ground wire. Typically, tensioning and pulling sites are located at angle structures and at substation locations for stringing the conductor and ground wire. Distances between each site vary depending on the right-of-way alignment, terrain, the length of the conductor pull, and the accessibility by equipment. Pulling sites will be aligned with the transmission line centerline, but typically be located on the far side of the angle structure. At each pulling site, stringing equipment will be set up approximately 400 feet from the structure for leveraging the conductor pull safely. The positioning of the stringing equipment at individual pull and tension sites will be determined by terrain, height of adjacent structures, and applicable industry standards. Where construction occurs in rough terrain, these sites may require larger, less symmetrical pulling and tensioning sites. The temporary disturbance area associated with each pull and tension site, and each mid-span splice site, is typically up to 200 feet by 500 feet. A clear, level work area is required at these sites to safely install the conductor and ground wires. If the existing terrain and vegetation at a pull and tension or splice location inhibit safe construction methods, the temporary work area of up to 200 feet by 500 feet will be cleared and leveled with heavy equipment to support construction activities. If the terrain is sufficiently level but vegetation hinders safe construction methods, the vegetation at the temporary work area may be mechanically cleared with a hydro ax or similar mowing equipment. During Project restoration activities, temporary work areas at the pull and tension and splice sites will be reclaimed.

While the majority of the alignment passes through low-lying scrub vegetation, the clearing of some natural vegetation along the proposed ROW may be required. Selective clearing would be performed only when necessary to provide for surveying, electrical safety clearances, line reliability, and maintenance. Topping or removal of mature vegetation, under or near the conductors, would be done to provide adequate electrical clearance as required by NESC standards. After line construction, all work areas not needed for normal transmission line maintenance would be graded to blend, as near as possible, with the natural contours, and revegetated and restored where required.

<u>Foundation and Guy-Anchor Installation:</u> Excavations for foundations will be made with power drilling and/or excavating equipment. In rocky areas, the foundation holes may be excavated by drilling and blasting, or special rock anchors may be installed. Safeguards (e.g., blasting mats) may be employed when adjacent areas need to be protected. In extremely sandy areas, soil stabilization by water or a gelling agent may be used prior to excavation. Foundation holes left open or unguarded will be covered to protect the public and wildlife. If practical, fencing may be used. Spoil material (excavated subsoil) will be used for fill where suitable.

After excavations are completed, precast or cast-in-place footings will be installed. The precast footings will be lowered into the excavated foundation hole, positioned, and backfilled. The cast-in-place footings will be installed by placing reinforcing steel and a tower stub into the foundation hole, positioning the stub, and encasing it in concrete. Spoil material will be used for fill, where suitable. The foundation excavation and installation will require access to the site by a power auger or drill, a crane, material trucks, and ready-mix trucks.

For those tower types that include guy wires, anchors will be installed at the structure site with power drilling or excavation equipment. Grouted earth anchors and plate anchors are among those that may be installed, depending on site specific conditions. Anchors will be installed to a depth necessary to provide the required structural support to the transmission tower. Some anchor locations may be positioned such that the installation equipment will need to drive beyond a typical 200-foot by 200-foot work area within the right-of-way to properly set the anchor. The installation of grouted earth anchors often produces a small amount of hardened grout, similar to concrete, at the surface. These hardened grout spoils may be positioned to protect the anchor from damage from passing vehicles.

<u>Delivery of Materials to the Right-of-Way:</u> Once temporary work sites and structure pads have been prepared, steel members and associated hardware will be delivered by truck. Trucks will be unloaded by forklifts, cranes, or other lifting equipment at identified work areas. Material handling and delivery will occur during much of the construction period to support efficient construction methods. After transmission tower component deliveries are completed, spools of conductor and ground-wire will be delivered to wire pulling and tensioning sites in advance of stringing activities.

<u>Assembly and Erection of Transmission Structures:</u> Depending on the specific tower type and the anticipated method of erection, transmission structures will be fully or partially assembled at each

tower pad or in groups at construction yards. In easily accessible terrain, each structure will likely be assembled on its designated tower pad. Guy supported structures will likely be assembled completely on the ground and then erected in one piece with the use of a crane and forklift. Structures that are fully assembled on the ground may require that a forklift drive beyond a typical 200-foot by 200-foot work area within the right-of-way in order to assist with the erection of the structure. Self-supporting lattice or tubular structures will be partially assembled on the ground at each tower pad and then erected in sections using a crane. Insulators, hardware, and stringing sheaves are often attached to the structure before it is erected.

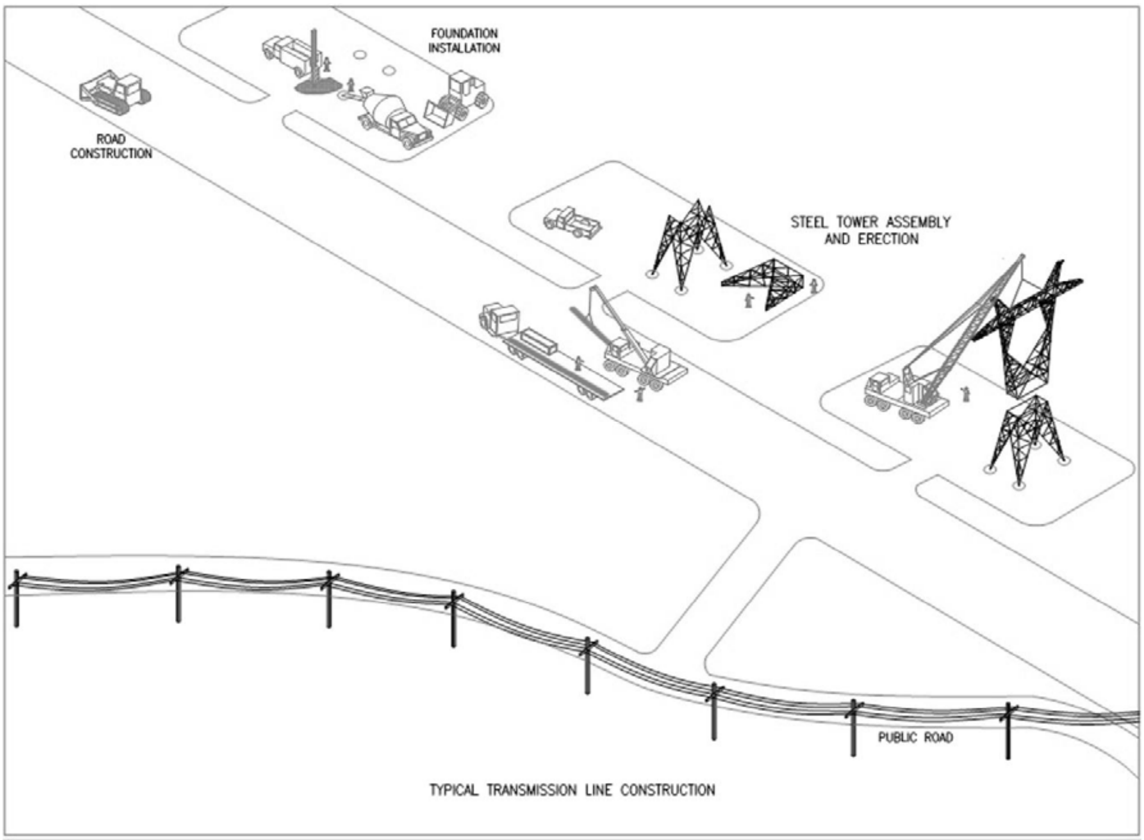


Figure 2-13: Foundation Installation, Tower Assembly, and Tower Erection

<u>Counterpoise Installation:</u> Part of standard construction practices prior to wire installation will involve measuring the resistance of tower footings. If the resistance to remote earth for each transmission tower is greater than 10 ohms, counterpoise (grounds) would be installed to lower the resistance to 10 ohms or less. Counterpoise may consist of a bare copper clad or galvanized steel cable buried a minimum of 12 inches deep, extending from one or more tower legs within the limits of the right-of-way and may be altered or doubled back-and-forth to meet the resistance standard. Typical equipment used for installing ground rods includes line trucks, backhoes, and trenchers.

<u>Conductor and Ground Wire Installation:</u> The towers will be rigged with insulator strings and stringing sheaves at each ground wire and conductor position.

Pilot lines will be pulled (strung) from tower to tower by either a helicopter or land operated equipment and threaded through the stringing sheaves at each tower. Following pilot lines, a stronger, larger diameter line will be attached to conductors to pull them onto towers. This process will be repeated until the ground wire or conductor is pulled through all sheaves.

Ground wires, fiber optic cable, and conductors will be strung using powered pulling equipment at one end and powered braking or tensioning equipment at the other end of a conductor segment. Sites for tensioning equipment and pulling equipment will be approximately 2 to 3 miles apart. The tensioning and pulling sites will be an area approximately 200 feet by 400-600 feet, depending on the structure's purpose (e.g., mid-span or dead-end). Tensioners, pullers, line trucks, wire trailers, dozers, pickups, and tractors needed for stringing and anchoring the ground wire or conductor will be located at these sites. The tensioner, in concert with the puller, will maintain tension on the ground wire or conductor while they are fastened to the towers.

Tension will be maintained on all insulator assemblies to ensure positive contact between insulators, thereby avoiding sparking. Caution also will be exercised during construction to avoid scratching or nicking the conductor surface, which may provide points for corona to occur. See Figure 2-14 for a general illustration of this procedure.

For protection of the public during wire installation, guard structures will be erected over public roads, power lines, structures, and other barriers. Guard structures will consist of H-frame wood poles placed on either side of the barriers or by using boom trucks raising a guard cross beam. These structures will prevent ground wires, conductors, or equipment from falling across obstacles. Equipment for erecting guard structures will include augers, backhoes, line trucks, boom trucks, pole trailers, and cranes. Guard structures may not be required for small roads. In such cases, other safety measures such as barriers, flagmen, or other traffic control will be used. Following stringing and tensioning of all conductors, the guard structures will be removed and the area restored.

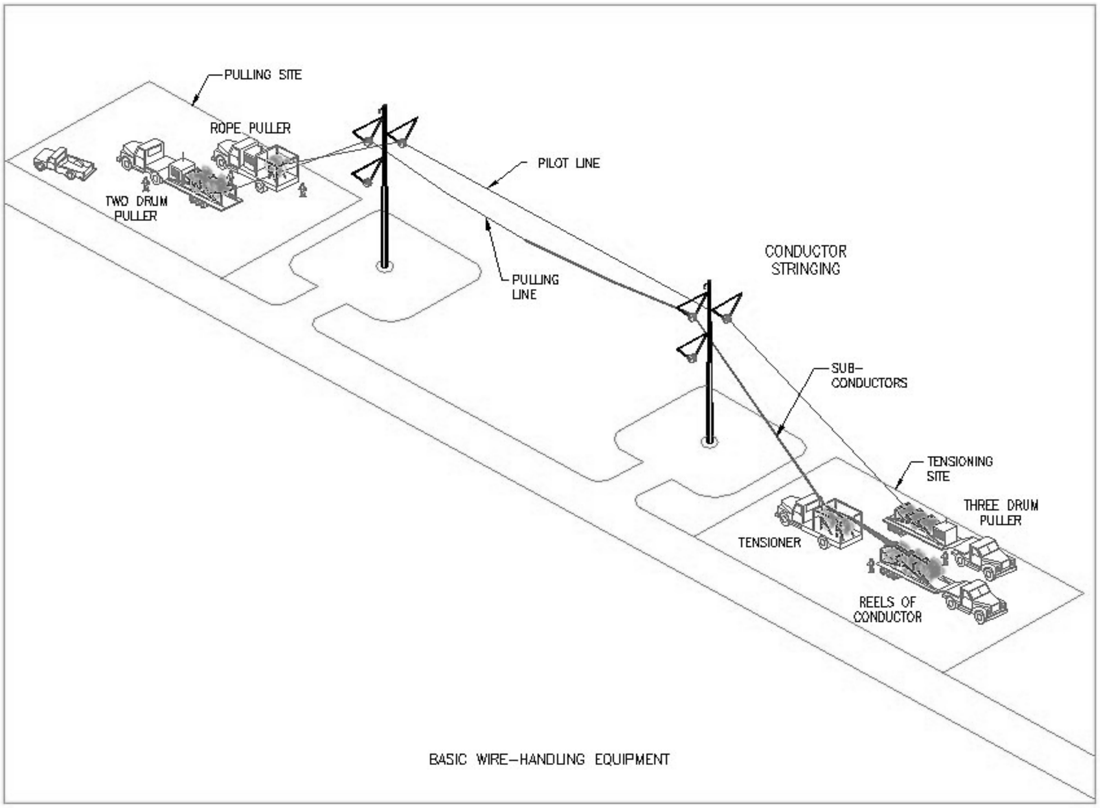


Figure 2-14: Typical Transmission Line Conductor Stringing Activities

2.11 Aviation Lighting

Because the turbines would exceed heights of 200 feet above ground level, the turbines would be marked or lighted per FAA Guidelines and an approved lighting plan. This will likely entail placing red lights on the nacelle of selected turbines to adequately warn aircraft pilots of the obstructions at night.

FAA night-time lighting requirements include the use of red, simultaneously flashing lights positioned on the outer perimeter of the wind turbine farm, each spaced no more than 0.5 mile from each other. The FAA determines which turbines would require nighttime lights, but it is anticipated that about half of the turbines would be marked by red lights, particularly the turbines closest to the Project boundary or on high terrain.

The intensity of the nighttime flashing red lights is approximately 2,000 candelas (a measure of the intensity of light—roughly equivalent to a 1,666-watt bulb) and they flash about 22 times per minute with a flash duration between 100 and 2000 milliseconds. The lighting would be similar in appearance to a series of cell phone towers. The lights are designed to flash in unison and to concentrate the beam in the horizontal plane, thus minimizing light diffusion down to the ground.

The FAA-required night-time lighting requirements would not change based on the turbine color. However, to comply with the FAA's aircraft safety lighting requirements, all turbines that are not a standard white or light off-white color also would be marked with lights that flash white at 20,000 candela (roughly equivalent to a 16,666-watt bulb) during the day. Daytime white lights would have a flash rate of 60 flashes per minute with a flash duration of less than 10 milliseconds.

MVE is investigating the ability to deploy an aircraft detection lighting system (ADLS) to mitigate the need for continuous operation of the red flashing lights during night-time hours. An ADLS system is comprised of one or more elevated radars that scan the region proximate to the Project area for aircraft, and only activate the red flashing lights on the turbines when an aircraft is detected within a specified distance. These systems must be approved by the FAA for deployment at a given wind facility. For the Project area, MVE anticipates two or three ADLS radar installations will be sufficient to provide coverage of the detection area proximate to the Project. These ADLS radar systems are proposed near the O&M areas in the central portion of the Project area.

2.12 Site Stabilization, Protection, and Reclamation

Site stabilization and protection practices will be implemented to prevent erosion of soils during wind and rainfall events. The potential for wind erosion will be minimized in accordance with the Project's Dust and Emissions Control Plan attached as Appendix O to the POD. The potential for erosion during rainfall events will be minimized in accordance with the Project's SWPPP, which includes BMPs such as weed-free straw wattles and silt fencing.

Reclamation at the close of Project construction will be implemented in accordance with the Project's Reclamation Plan attached as Appendix E to the POD. This plan specifies the procedures for restoration of those areas temporarily disturbed during construction and will address, as applicable, removal of temporary features (e.g., temporary access roads, pulling and tensioning sites, and offsite laydown areas), and revegetation.

3.0 Related Facilities and Systems

3.1 Transmission System Interconnect

3.1.1 Existing and Proposed Transmission System

Existing Transmission System: The Project site is crossed by three (3) existing 345 kV transmission lines, the Midpoint to Adelaide 345 kV transmission line, the Midpoint to Borah 345 kV transmission line, and the Midpoint to Kinport 345 kV transmission line. The alignment of these existing lines can be found on Figure 6-1.

Two other existing high-voltage transmission lines are in the general vicinity but do not directly cross the Project area, the Midpoint to Hemmingway 500 kV transmission line and the Midpoint to Valmy 345 kV transmission line. In addition, the right-of-way for the authorized but not yet constructed Southwest Intertie Project – Northern Portion (SWIP-North) 500 kV transmission line is located in the general vicinity of the Project area. SWIP-North is a planned point of interconnection for the Project. These additional facilities are also found on the map in Figure 6-1.

These existing transmission facilities all interconnect to the 230/345/500 kV Midpoint Substation which is located approximately 12 miles west of the Project near US Highway 93 in Jerome County. Midpoint Substation is a planned point of interconnection for the Project.

The Project area is bisected by a designated 3,500-foot wide West-Wide Energy Corridor identified as corridor 49-112. The Midpoint to Adelaide 345 kV transmission line is located within that utility corridor. Also in the region is a 3,500-foot wide West-Wide Energy Corridor identified as 112-226. The permitted SWIP-North and the existing Midpoint to Valmy transmission lines are located within that utility corridor.

Proposed Transmission System: A description of the Project's 34.5 kV collector lines and 230 kV and 500 kV transmission lines can be found in Section 1. Section 2 provides information on the construction of these proposed facilities.

3.1.2 Ancillary Facilities and Substations

A description of the Project's substations can be found in Section 1. Section 2 provides information on the construction of these proposed substations.

3.1.3 Status of Interconnect Agreement

MVE has secured a queue position with Idaho Power Company ("IPC") in their Large Generator Interconnection Process, and entered into a study agreement. IPC has delivered the Feasibility Study Report and System Impact Study Report. Completion of a Facilities Study is the next phase of the interconnection process.

3.2 Meteorological Towers

MVE currently has eight (8) temporary meteorological towers ("met towers") installed across the Project site to record wind conditions. MVE has also deployed a LiDAR to record wind speeds at higher elevations and confirm other atmospheric conditions suggested by the met tower data. When the Project is constructed, five (5) permanent met towers will be installed in order to continue recording wind conditions and compare that data to wind turbine performance. MVE will install some or all permanent met towers a number of months before the temporary met towers are removed so that data collection overlaps. Temporary met towers will be removed prior to or during construction (or at the end of their respective ROW term, if sooner).

The permanent met towers typically have heights at least to the wind turbine hub height. MVE has not yet selected a design for the met towers, but anticipates that the towers will be steel monopole or lattice. MVE will explore the potential use of using non-guyed towers, however site conditions may require guyed structures.

Sensors on the met towers may include anemometers, wind direction vanes, air temperature proves, and humidity sensors. The output of these sensors will be connected via fiber optics to the nearest wind turbine, and then back to the operations center over the Project's fiber optic network.

3.3 Other Related Systems

During construction, MVE may investigate means of improving the wireless communications on-site. Mobile radio repeaters and cellular stations may be placed on-site in areas already disturbed for Project construction. If any such equipment is used, it will be licensed with appropriate regulatory agencies and removed upon construction completion.

MVE will explore voice and data communication options through local providers for use during operation, most likely connected along the same overhead poles as the distribution power connection. It is possible there will also be a fiber optic connection to the Project's transmission provider.

4.0 Operations and Maintenance

4.1 Operation and Facility Maintenance Needs

The functionality of the wind turbines and safety systems will be tested to ensure they operate in accordance with the manufacturer's specification before the turbines are commissioned for operation. In general the order of energizing the system would be:

- Interconnection switchyard
- 345 kV or 500 kV transmission line
- 345 kV or 500 kV substation
- 230 kV transmission network
- Collection substations
- 34.5 kV collector lines
- Pad mounted transformers at each wind turbine
- Wind turbines

At each stage, testing would be performed to ensure the equipment has been installed correctly. When all systems have been tested and are operating properly, the Project would be commissioned for operation.

Due to the nature of wind farm facilities that are comprised of many individual wind turbine generators, O&M activities would not affect the entire wind farm's operation. Annual maintenance would be conducted on a turbine-by-turbine basis and would not affect overall performance of the Project. MVE would likely schedule this annual maintenance during the season with the lowest expected wind resource in order to minimize impacts on the performance of the facility.

The operational staff will perform routine maintenance, long-term maintenance, and emergency work. The facility staff will be responsible for arranging needed repairs either through internal resources or with the aid of additional contractor support.

Routine wind turbine maintenance typically occurs every six months to a year. The requirements for scheduled maintenance varies by turbine vendor. The following activities may apply:

- Visual and noise inspection of all major turbine components
- Torque checks on tower and component bolts
- Level and leak check on lubrication systems
- Lubricate appropriate seals and bearings
- Level and leak check and sampling of gearbox oil
- Replace gearbox oil filters
- Brake system inspections
- Test control and emergency systems
- Inspect aviation warning lights

Long-term maintenance may include replacement/rebuilding and cleaning larger components such as generators and gearboxes, testing electrical components, and refurbishing blades. For most O&M work, MVE anticipates a permanent disturbance work area of a 100-foot radius around the turbine should be sufficient. Certain unplanned work such as blade repairs or repairs to other large components may require the use of a crane to complete the work. If necessary, a crane would be brought in on trucks and assembled at the turbine site. Necessary temporary disturbance areas will be reopened to perform necessary O&M activities. For example, if a large turbine component needs to be replaced or a crane is needed onsite, intersection/turn improvements and turbine work areas would need to be reopened to the temporary disturbance dimensions to accommodate the space needed to perform the O&M activities. Upon completion of the O&M activities, the reopened areas would be reclaimed consistent with methods utilized post-construction.

4.2 Maintenance Activities

<u>Roads:</u> The Project roads will receive maintenance as needed. Road surfaces will be bladed and maintained so that safe access to all Project areas is provided while minimizing dust generation. Periodic inspection and maintenance will be done for drainage and erosion control measures. Snow removal will be performed as required to ensure safe access for personnel. Snow removal will occur to accommodate daily traffic from public roads to the O&M facilities. Other Project roads will be plowed if O&M staff needs to gain access to a particular Project component to perform O&M activities.

<u>Collection system:</u> For the underground portions of the collector lines, most maintenance issues arise where the lines connect to the junction boxes. Junction boxes are installed above ground so that it is easy to access them. If an issue occurs away from a junction box, MVE will use testing to identify the location of the fault and would excavate a small portion of the cable and replace it. The excavation disturbance would then be reclaimed per the requirements of the reclamation plan.

The overhead portions of the collector lines would be inspected and repaired as needed. If a section of the overhead line needs replacement, it will be done in a manner similar to the original installation.

<u>Substations:</u> Preventative maintenance is often performed on an annual basis that usually includes a brief (less than 1 day) shut-down and de-energization. Substation maintenance can typically be performed within the substation fence and without large equipment.

<u>Transmission lines:</u> The transmission line will be inspected annually or as required, by using fixed-wing aircraft, helicopters, drones, ground vehicles, all-terrain vehicles, or on foot. Maintenance will be performed as needed, and the comfort and safety of land users and local residents will be provided for by limiting noise, dust, and the danger caused by maintenance vehicle traffic.

Accepted standard utility practices, such as repeated tree trimming and brush removal, will be followed to maintain the ROW. MVE will comply with agency requirements regarding management of noxious weeds within the ROW, along access roads, and at temporary use areas.

Other facilities: The met towers will receive maintenance annually or as needed to replace sensors, check structure conditions, and check guy wire tension (if guy-wired structures are used).

The O&M building will received as-needed maintenance.

4.3 Operations Workforce, Equipment, and Ground Transportation

The O&M building will be used to store equipment and supplies required for operations and maintenance of the Project, house control functions such as the control system used to provide two-way communication with each wind turbine, and provide a facility where O&M personnel can prepare documentation of work done on wind farm facilities. The O&M building (see Figure 4-1) typically houses the O&M crew, stores spare parts, and provides facilities to monitor the Project.

Figure 4-1: Example O&M Building

MVE intends that the telecommunications and electrical services for the O&M building will be from local providers. External lighting would be minimal with downward directed lighting. MVE may install a chain-link fence that would be up to 8 feet high and may be topped with barbed wire.

A water supply well, comparable in capacity and design to a residential well (typically 10- to 15-gallons per minute), may be drilled on the O&M site to provide potable water to the O&M building for domestic water supplies. All necessary entitlements and permits will be acquired prior to construction and permit requirements will be followed during construction. Similarly, a septic system comparable in capacity and design to a residential system may be installed for the O&M building.

Limited quantities of lubricants, cleaners, and detergents would be stored near and within the O&M building. Waste fluids will be stored in accordance with applicable regulations at the O&M building for short periods of time during Project operations. BMPs incorporated into the design of the O&M facility, including containment areas and warning signs, would minimize the risk of accidental spill or release of hazardous materials at the facility. No risk to health and safety or the environment is anticipated.

The O&M building would be staffed during typical business hours, although there may be occasions when employees would work on weekends as well. Because turbines can be operated remotely, there is no need to have personnel on site 24 hours per day. It is anticipated that up to 20 workers will be employed during the operations phase of the project.

The O&M building would be located near the location where the primary access road enters the Project site. This will provide easy access to the O&M staff and prevent any possible unnecessary disturbance in the Project site.

5.0 Environmental Considerations

5.1 General Description of Site Characteristics and Potential Environmental Issues

MVE will plan and implement all aspects of the Project with the intent of minimizing effects to environmental resources, to the extent practicable, from any new infrastructure required. Measures will be applied to avoid, minimize, or mitigate potential effects to environmental resources from construction and operation of the Project. The following sections discuss conditions and resources within the Project site and the proposed methods, procedures, and protocols for effectively identifying, monitoring, and evaluating those resources. MVE will utilize the results of what is outlined and proposed herein to inform discussions with the BLM and other stakeholders, such that effective avoidance, protection, and mitigation measures may be discussed where called for.

5.1.1 Sensitive Species and Habitats

MVE has retained an environmental consulting firm to prepare a study plan for conducting a suite of baseline wildlife and plant surveys at the Project site. The proposed studies follow guidance from the US Fish and Wildlife Service's ("USFWS") Land-based Wind Energy Guidelines ("WEG") for Tier 3 studies (USFWS 2012), Eagle Conservation Plan Guidance ("ECPG"; USFWS 2013), and the current rules for eagle take permits (USFWS 2016). These studies also incorporate resource specialists' experience working in Idaho with USFWS, Bureau of Land Management ("BLM"), and Idaho Department of Fish and Game ("IDFG"). Continued coordination with these agencies will ensure field surveys will be implemented in accordance with current agency protocols.

The initial study plan includes the following tasks: 1) meetings with federal/state agencies to gather additional information; 2) fixed-point avian use surveys; 3) eagle/raptor nest surveys; 4) desktop-level impact assessment for greater sage-grouse (Centrocercus urophasianus); 5) Ground checks of active and pending leks within the Project area; 6) Aerial reconnaissance for leks within or in proximity to the Project; 6) bat acoustic monitoring surveys as well as NABat acoustic monitoring surveys; 7) wetland delineation surveys; 8) vegetation sampling and assessment; and 9) pre-construction surveys for a suite of designated BLM sensitive species. Full study plans and methodologies, as approved by the requisite state/federal agencies, will be implemented to characterize the existing resource conditions in the Project area.

5.1.2 Special Land Use Designations

MVE has performed a desktop review of aerial imagery and land use planning information available in the public domain focused on existing and planned land uses, prime farmland, and zoning districts in Jerome, Lincoln, and Minidoka counties for the Project.

<u>Existing land use:</u> Existing land use in the Project area consists primarily of rangeland with pockets of center pivot-irrigated cropland and low-density, single-family residences associated with these agricultural uses. A network of dirt and gravel county roads, State Highway 24, and US Route 26 provide surface transportation in the Project area. In Lincoln County, a Union Pacific Railroad segment between the Dietrich Butte and Sid/Owinza Butte areas provides long-distance freight transport. Land that the State of Idaho manages exists in Sections 16 and 36 in several sections in and around the Project area. Existing utilities include electric power transmission and distribution lines.

<u>Planned land use:</u> In and around the Project area, planned land uses seek to continue existing agricultural uses. Per the 2018 Jerome County Comprehensive Plan, agriculture is the planned land use in and around the Project area. The Plan's objectives for land use include preserving agricultural uses. The 2013 Minidoka County Comprehensive Plan also seeks to preserve the rural atmosphere, whereby agricultural uses can continue to flourish. MVE does not consider a wind energy infrastructure to be a conflicting land use with agricultural uses.

<u>Prime farmland:</u> The United States Department of Agriculture ("USDA") designates prime farmland, which is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these land uses. Prime farmland has a combination of soil properties, growing season, and moisture supply needed to produce sustained high yields of crops in an economic manner if it is treated and managed according to acceptable farming methods. In general, prime farmland has an adequate and dependable water supply from precipitation or irrigation, a favorable temperature and growing season, an acceptable level of acidity or alkalinity, an acceptable content of salt or sodium, and few or no rocks (USDA 2015).

In Idaho, state and local government resource agencies can also designate prime farmland and farmland of statewide or local importance, which include similar characteristics as prime farmland if managed according to acceptable farming methods. Farmland can also be defined as unique if it produces specialized crops. A preliminary review of soils data suggests that prime farmland may exist over a relatively small portion of the Project area. A more detailed review will be necessary to determine if prime farmland is present.

5.1.3 Visual Resource Management ("VRM") Designations

The Project is located within the Snake River Plain Section of the Columbia Plateau Physiographic Province, Intermountain Plateau Division. Basaltic plains punctuated by extinct lava buttes characterize the Project area. Cultivated areas and open range are dominant, with sagebrush and grassland covering most of the landscape not under cultivation.

The Project is located within a mix of private lands and federal lands, with sections of state-owned land regularly scattered throughout the area. Visual resources on BLM land is managed under the Visual Resource Management ("VRM") classification system, with VRM Class I being the most restrictive and VRM Class IV being the least restrictive designations. The Monument Resource Management Plan ("RMP") establishes VRM Classes on BLM land within the Project area.

A detailed analysis using BLM VRM contrast rating analysis specific to sensitive viewpoints will be used to determine constancy with established VRM Classes.

5.1.4 Cultural and Historic Resource Sites and Values

During the course of Project construction, operations, and maintenance, MVE, its contractors and all project personnel must comply with federal and state laws and regulations including, but not limited to:

- Section 106 of the National Historic Preservation Act (16 United States Code [USC] 470 [1966]); implementing regulations at 36 Code of Federal Regulations (CFR) 800 (2000), including Planning for Subsequent Discoveries Using a Programmatic Agreement (36 CFR 800.13(a)(1) [2000]) and Post-Review Discoveries Without Prior Planning (36 CFR 800.13(a)(2)(b) [2000]);
- Secretary of Interior's Professional Qualification Standards as described in 36 CFR 61;
- The Native American Graves Protection and Repatriation Act (25 USC 3001, implementing regulations at 43 CFR 10);
- The Archaeological Resources Protection Act (16 USC 470aa), implementing regulations at 43 CFR 7 for BLM;
- Idaho Code Title 67 Chapter 41: Idaho Historical Society; and
- Idaho Code Title 27 Chapter 5: Sections 27-502 through 27-504: Protection of Graves.

To initially evaluate the number of cultural resources within the proposed Project area and to establish a general impression of the archaeological sensitivity of the Project area and its surrounding environment, several databases and maps were consulted for the property as well as a 1.0-mile buffer beyond the Project areas boundaries. Sources included online databases for the NRHP listed properties, National Historic Trails, National Historic Landmarks, and historic General Land Office plat maps, and National Historic Trails maps; which were reviewed for the potential presence of those resources. MVE intends to conduct a detailed cultural resources investigation, and is currently working to complete a Class I literature review/file search in order to identify any newly or previously recorded cultural resources located in or near the Project Area.

<u>Paleontological resources:</u> During the course of Project construction, operations, and maintenance, the Proponent, its contractors and all project personnel must comply with federal and state laws and regulations including, but not limited to:

- Paleontological Resources Protection Act of 2009 (Public Law 111-011)
- Idaho Code Title 67 Chapter 41: Idaho Historical Society; Part 4119

The state geologic map was consulted to determine the potential for, and possible extent of paleontological resources within the proposed Project study area, and to establish a general impression of the fossil sensitivity of the Project area and its surrounding environment. Based on geologic understanding of a particular area, the BLM provides a Potential Fossil Classification (PFYC) rating for geological units and their potential to produce fossils. These are summarized as:

Class 1: Very Low

Class 2: Low

Class 3: Moderate/Undetermined

Class 4: High

Class 5: Very High

A review of the state geological map shows that the entirety of the Project area falls within the Quaternary to Eocene Continental Volcanic and Intrusive Rocks ("QTb") geological unit, comprised of flows and cinder cones of olivine tholeiite basalt and shallow basalt intrusives. These types of deposits are typically rated as Class 1, suggesting that while possible, the potential for fossils to be present is very low.

5.1.5 Native American Tribal Considerations

The lead federal agency will be required to conduct Native American consultation with tribes in southern Idaho; specific tribes will be determined by the lead federal agency. Although no known Traditional Cultural Properties (TCPs) or traditional use areas occur in the Project study area, it is through this process that any potential Tribal concerns would be brought to light and addressed through the consultation process. It is possible that interested Tribes may include the Confederated Tribes of the Umatilla Indian Reservation (CTUIR), the Shoshone-Bannock Tribes of the Fort Hall Indian Reservation, and other Shoshone-Paiute groups.

5.2 Other Uses on Project Site

Other utilizations of the Project site, such as existing authorized land uses, public access, and recreational activities will be reviewed and evaluated in consultation will all stakeholders. Consideration of such uses will be used to inform development of the Project and will influence design refinement.

5.2.1 Aviation and/or Military Considerations

The following airports lie in the general vicinity of the Project:

- Dietrich Landing Area – approximately one mile south of the Dietrich Butte area in Lincoln County.
- Shoshone Landing Area – approximately 5.4 miles west of the Dietrich Butte area in Lincoln County.
- Klosterman Landing Area – approximately six miles southeast of the Kimama Butte area in Minidoka County.
- Reynolds Airport – approximately 6.3 miles northeast of the Dietrich Butte area in Lincoln County.
- Hazelton Municipal Airport – approximately 10 miles southwest of the Cheatgrass Reservoir area in Jerome County.
- Jerome County Airport – approximately 12 miles southwest of the Wilson Butte area in Jerome County.
- Fairbanks Airfield – approximately 15 miles southwest of the Cheatgrass Reservoir area in Jerome County.
- Laidlaw Corrals Airport – approximately 16 miles northeast of the Sid/Owinze Butte area in Lincoln County.

The Dietrich Landing Area is the closest airstrip to the Project study area. This private facility is not subject to Federal Aviation Administration ("FAA") regulations governing navigable airspace. Nevertheless, MVE plans to coordinate Project activities with this facility's owners to ensure that Project construction activities avoid interference with landing area operations to the greatest extent possible.

Given the distances between Project components and the county and municipal airports listed above, no impacts to airspace navigation are expected. To confirm this, a more detailed review of Project components, particularly wind turbine and transmission structure heights, site elevations, and coordinates will be conducted to determine whether these components may obstruct navigable airspace or cause interference with ground-based navigational aids.

The FAA/Department of Defense Preliminary Screening tool was used to determine potential FAA permitting processes for the Project area. The Long Range Radar screening tool indicates the Target Area is in a green zone, which signifies there are no anticipated impacts to Air Defense and Homeland Security radars. However, an aeronautical study, such as an obstruction evaluation and airport airspace analysis, will still be required by the FAA in order to be compliant with FAA objectives to promote air safety and the efficient use of the navigable airspace. The Next-Generation Radar screening tool also indicates impacts from development of the Project are not likely and National Oceanic and Atmospheric Administration will likely not perform a detailed analysis, but they still request to be informed of the Project. The preliminary review of the Military Operations screening tool did not return any likely impacts to military airspace. MVE will continue coordinating with the agencies listed above to ensure they are informed as design of the Project is refined.

5.2.2 Other Environmental Considerations

<u>Soil resources:</u> The dominant soil order in the Project region are Aridisols and Mollisols (USDA NRCS 2006). The soils in the area most dominantly have a mesic or frigid soil temperature regime, an aridic or xeric soil moisture regime, and mixed or smectitic mineralogy. They generally are well drained, clayey or loamy, and shallow or moderately deep.

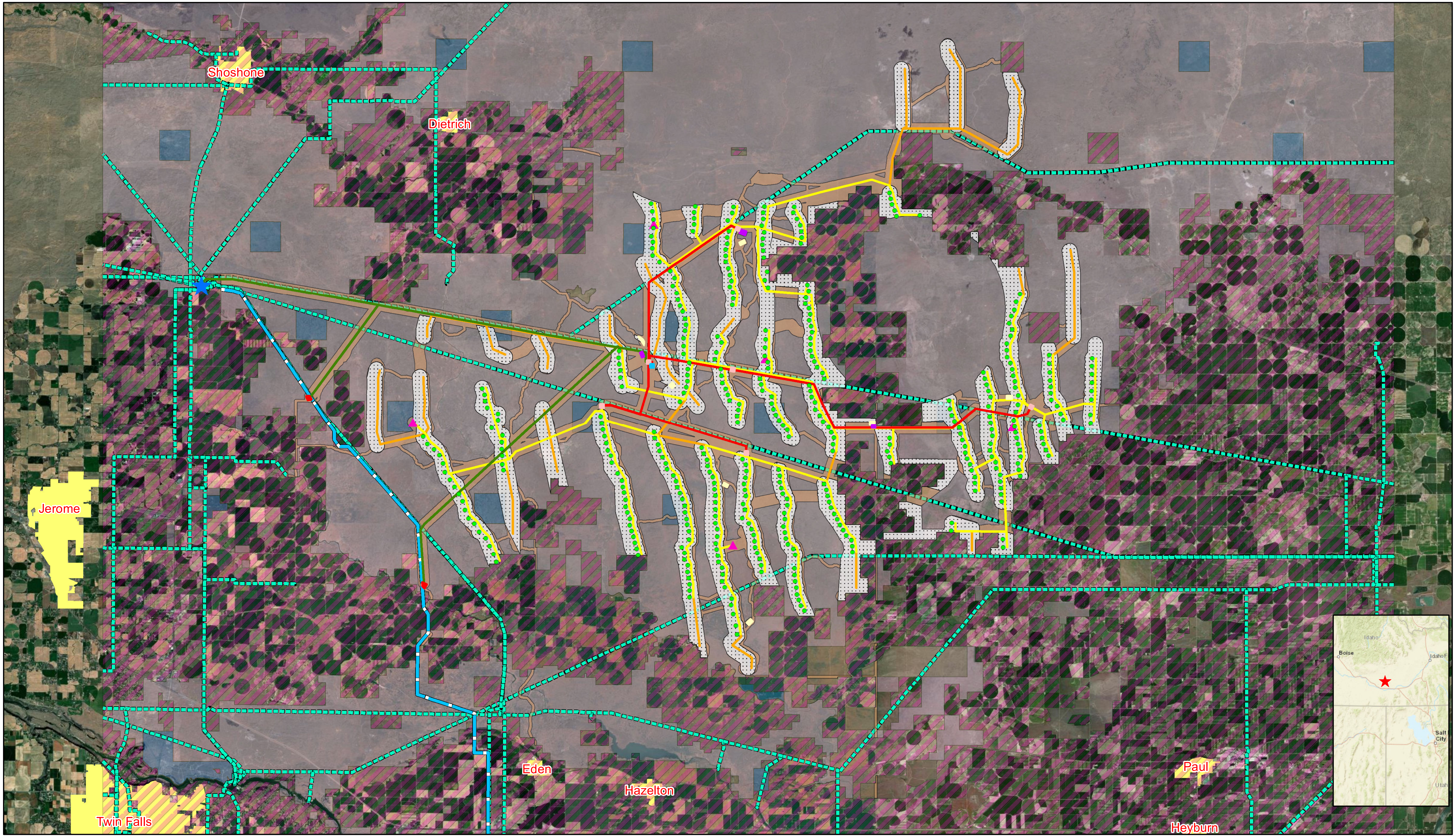
The SSURGO database identified 40 soil types that occurred in the Project area, most of which were composed of various types of complexes. Power-Owinza-Rock outcrop complex, 1 to 8 percent slopes, Snowmore-Minveno-Hoosegow complex, 2 to 10 percent slopes, Rock outcrop-Banbury-Paulville complex, 2 to 6 percent slopes; Paulville-McPan-Starbuck complex, 1 to 8 percent slopes, Catchell-Paulville complex, 2 to 10 percent slopes, Idow-Power-Minveno complex, 1 to 4 percent slopes, Vickery-Paulville complex, 2 to 8 percent slopes, Power-McCain complex, 1 to 6 percent slopes; these eight types compose approximately y 80% of the Project area.

5.3 Design Criteria

An initial set of design criteria has been proposed by MVE in Appendix H. MVE will use the results from the resource field studies to propose additional design criteria for various Project elements. MVE will look to implement best practices in all areas of project design in order to avoid, minimize, or mitigate potential effects to environmental resources from construction and operation of the Project.

6.0 Maps

Representative drawings and figures of Project features are dispersed throughout this document. This section includes two maps – Preliminary Electrical Design Overview Map (Figure 6-1) and Preliminary Civil Design Overview Map (Figure 6-2). Maps displaying greater detail of the Project layout are found in Appendix A – Site Plans.



Land Ownership

- BLM
- PRIVATE
- STATE
- Township

- Proposed Turbine
- Proposed Met Tower
- Proposed Substation Yard
- Proposed BESS Yard
- Proposed O&M Storage Yard
- Proposed Laydown Yard
- Planned SWIP-N Line
- Alternate POI Substation
- Existing Transmission Line
- Combined Corridor
- BOP Corridor
- Midpoint Substation
- Collection Line 35kV - Primary
- Collection Line 230kV - Primary
- Collection Line 500kV - Primary
- Collection Line 35kV - Alternate

N E S W

0 2 4 Miles

Coordinate System: NAD 1983 StatePlane Idaho Central FIPS 1102 Feet

MOTT MACDONALD

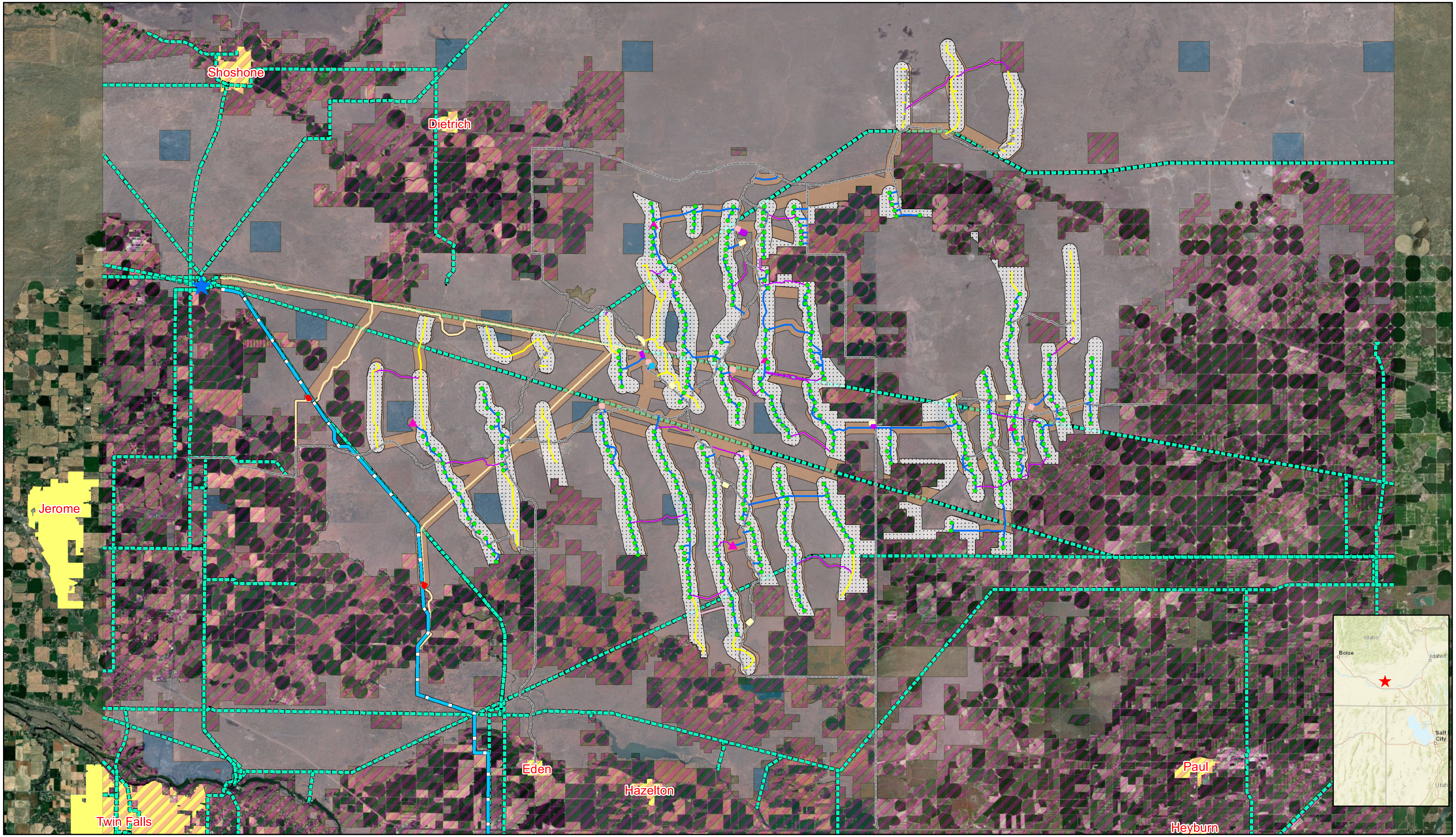
MAGIC VALLEY ENERGY

LAVA RIDGE WIND PROJECT

FIGURE 6-1. ELECTRICAL DESIGN OVERVIEW - DRAFT

LINCOLN COUNTY, JEROME COUNTY, MINIDOKA COUNTY, IDAHO

165 S Union Boulevard, Suite 200 Lakewood, Colorado 80228	Designed	Drawn	Checked	Approved	Date
	EMJ	EMJ	KAW	RA	6/21/2021



Land Ownership

- BLM
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- Township

- Proposed Turbine
- Proposed Met Tower
- Proposed Substation Yard
- Proposed BESS Yard
- Proposed O&M Storage Yard
- Proposed Laydown Yard
- Existing Transmission Line
- Alternate POI Substation
- Planned SWIP-N Line
- Combined Corridor
- BOP Corridor
- Proposed Access Road
- Alternate Access Road
- Existing Roads To Be Used
- Proposed Temporary Crane Path
- Alternate Temporary Crane Path
- Midpoint Substation
- Access Road to Alternate POI

N E S W

0 2 4 Miles

Coordinate System: NAD 1983 StatePlane Idaho Central FIPS 1102 Feet

MOTT MACDONALD

MAGIC VALLEY ENERGY

LAVA RIDGE WIND PROJECT

FIGURE 6-2. CIVIL DESIGN OVERVIEW - DRAFT

LINCOLN COUNTY, JEROME COUNTY, MINIDOKA COUNTY, IDAHO

165 S Union Boulevard, Suite 200 Lakewood, Colorado 80228	Designed	Drawn	Checked	Approved	Date
	EMJ	EMJ	KAW	RA	6/21/2021