U.S. Department of the Interior
Bureau of Land Management

Final Environmental Assessment
DOI-BLM-NV-L020-2010-0007-EA
October 2010

Spring Valley Wind Energy Facility

Location:
Spring Valley, White Pine County, Nevada

Applicant/Address:
Spring Valley Wind LLC
1600 Smith Street, Suite 4025
Houston, Texas 77002

U.S. Department of the Interior
Bureau of Land Management
Schell Field Office
Phone: (775) 289-1800
Fax: (775) 289-1910

BLM

This page intentionally left blank.

CONTENTS

Appendices

Figures

Tables

ACRONYMS AND ABBREVIATIONS

AADT	average annual daily traffic
ABPP	Avian and Bat Protection Plan
ACEC	Area of Critical Environmental Concern
AFY	acre-feet per year
AHPA	Archaeological and Historic Preservation Act
AIRFA	American Indian Religious Freedom Act
amsl	above mean sea level
APE	area of potential effect
ARPA	Archaeological Resources Protection Act
AUM	animal unit month
BGEA	Bald and Golden Eagle Protection Act
BLM	Bureau of Land Management
BMP	best management practice
Census Bureau	U.S. Census Bureau
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	carbon monoxide
CO_2	carbon dioxide
COM	Construction, Operation, and Maintenance
dB	decibels
dBA	A-weighted sound levels
DOE	Department of Energy
DR	Decision Record
EA	Environmental Assessment
EIA	Energy Information Administration
EO	Executive Order
EPA	U.S. Environmental Protection Agency
EPAct 05	Energy Policy Act of 2005
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FIPP	Financial Institution Partnership Program
FLMPA	Federal Land Policy and Management Act
FONSI	Finding of No Significant Impact
GBNP	Great Basin National Park
GHG	greenhouse gas
GIS	geographic information system
GPD	gallons per day

GPS	global positioning system
HV	high voltage
HWI	HawkWatch International
IA	Interconnection Agreement
IM	Instruction Memorandum
IPCC	Intergovernmental Panel on Climate Change
KOP	Key Observation Point
kV	kilovolt
Ldn	day-night level
Leq	equivalent sound levels
MBTA	Migratory Bird Treaty Act
MET tower	meteorological tower
mph	miles per hour
m/s	meters per second
MW	Megawatt
NAC	Nevada Administrative Code
NAGPRA	Native American Graves and Repatriation Act
NDEP	Nevada Department of Environmental Protection
NDOT	Nevada Department of Transportation
NDOW	Nevada Department of Wildlife
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NNHP	Nevada's Natural Heritage Program
NPS	National Park Service
NRHP	National Register of Historic Places
NRS	Nevada Revised Statutes
NWCC	National Wind Coordinating Collaborative
O&M	operations and maintenance
OHV	off-highway vehicle
OSHA	Occupational Safety and Health Administration
PEIS	Programmatic Environmental Impact Statement
PL	Public Law
$PM_{2.5}$	particulate matter with diameter of 2.5 microns or less
PM_{10}	particulate matter with diameter of 10 microns or less
POD	Plan of Development
PPA	Power Purchase Agreement
RD	rotor diameters
Recovery Act	American Recovery and Reinvestment Act of 2009

RFFA	Reasonably Foreseeable Future Action
RI	risk index
RMP/FEIS	Resource Management Plan/Final Environmental Impact Statement
ROD	Record of Decision
ROW	right-of-way
rpm	rotations per minute
RPS	Renewable Portfolio Standard
RSA	rotor-swept area
SCADA	Supervisory Control and Data Acquisition
SHPO	State Historic Preservation Officer
SMP	suggested management practice
SNWA	Southern Nevada Water Authority
SPP	Spill Prevention Plan
SR	State Route
SRMA	Special Recreation Management Area
SVW	Spring Valley Wind LLC
SVWEF	Spring Valley Wind Energy Facility
SWCA	SWCA Environmental Consultants
SWIP	Southwest Intertie Project
SWPPP	Stormwater Pollution Prevention Plan
TAC	Technical Advisory Committee
TCP	Traditional Cultural Property
TWA	time-weighted average
USC	United States Code
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VRM	Visual Resource Management
WTG	wind turbine generator

This page intentionally left blank.

1.0 INTRODUCTION

This Environmental Assessment (EA) has been prepared to analyze Spring Valley Wind, LLC's (SVW's), proposal to construct the Spring Valley Wind Energy Facility (SVWEF). The EA is a site-specific analysis of potential impacts that could result from implementation of the Proposed Action or selected alternative. The EA assists the Bureau of Land Management (BLM) in project planning and in ensuring compliance with the National Environmental Policy Act (NEPA).

SVW has also applied for a loan guarantee from the U. S. Department of Energy (DOE) Loan Guarantee Program under Title XVII of the Energy Policy Act of 2005 (EPAct 05) for construction and startup of this facility. DOE is a cooperating agency in the development of this EA pursuant to its jurisdiction under the EPAct 05 to issue a loan guarantee to SVW to assist with the financing of the SVWEF. Issuance of a loan guarantee is subject to review under NEPA, and DOE will use this EA to assist its decision-making regarding whether to issue a loan guarantee to SVW.

This document is tiered to, and incorporates by reference, both the Ely Proposed Resource Management Plan/Final Environmental Impact Statement (RMP/FEIS), released in November 2007 (BLM 2008a), and the BLM Wind Energy Development Programmatic Environmental Impact Statement (PEIS), released in June 2005 (BLM 2005). Should a determination be made that implementation of the Proposed Action would not result in significant environmental impacts or significant environmental impacts beyond those already disclosed in the existing NEPA documents, a Finding of No Significant Impact (FONSI) would be prepared to document that determination and a Decision Record (DR) issued that provides a rationale for approving the selected alternative.

1.1 Background

In order to address the growing interest in developing wind energy resources and National Energy Policy recommendations to increase renewable energy production capability, the BLM began evaluating wind energy potential on public lands and developing a wind energy policy (National Energy Policy Development Group 2001). In October 2003, the BLM started preparation of a PEIS to analyze the potential impacts of wind energy development to public lands and to minimize those impacts to natural, cultural, and socioeconomic resources. The PEIS was published in June 2005, and in December 2005 the ROD was signed to implement a comprehensive Wind Energy Development program on BLM-administered lands in the western United States. The program has established policies and best management practices (BMPs) to address the administration of wind energy development actions on BLM lands and identifies the minimum requirements for mitigation measures. The programmatic policies and BMPs of the Wind Energy Development program allow project-specific analysis to focus on the site-specific issues and concerns of individual projects as outlined on pages A3–A4 of Attachment A to the ROD:

> The level of environmental analysis to be required under NEPA for individual wind power projects will be determined at the FO (Field Office) level. For many projects, it may be determined that a tiered environmental assessment (EA) is appropriate in lieu of an EIS. To the extent that the PEIS addresses anticipated issues and concerns associated with an individual project, including potential cumulative impacts, the BLM will tier off of the decisions embedded in the PEIS and limit the scope of additional project-specific NEPA analyses. The site-specific NEPA analyses will include analyses of project site configuration and micrositing considerations, monitoring program requirements, and appropriate mitigation measures. In particular, the mitigation measures discussed in Chapter 5 of the PEIS may be consulted in determining site-specific requirements. Public involvement will be incorporated into all wind energy development

> projects to ensure that all concerns and issues are identified and adequately addressed. In general, the scope of the NEPA analyses will be limited to the proposed action on BLM-administered public lands; however, if access to proposed development on adjacent non-BLM-administered lands is entirely dependent on obtaining ROW access across BLM-administered public lands and there are no alternatives to that access, the NEPA analysis for the proposed ROW may need to assess the environmental effects from that proposed development. The BLM's analyses of ROW access projects may tier off of the PEIS to the extent that the proposed project falls within the scope of the PEIS analyses. (BLM 2005)

On March 11, 2005, BLM released H-1601-1, Land Use Planning Handbook, replacing the previous version. Appendix C of the new Handbook directs that Land Use Plans identify "existing and potential development areas for renewable energy projects (e.g., wind and solar)." Map 13 of the Ely RMP/FEIS (BLM 2008a) identifies the wind energy potential in Spring Valley, east of Ely, Nevada, as "moderate to high," but no areas were specifically designated for development.

On August 24, 2006, the BLM Washington Office issued Instruction Memorandum (IM) 2006-216, Right-of-Way Management, Wind Energy Land Use Plan Amendments, Wind Energy. The IM provided guidance on issuing rights-of-way (ROWs) for wind energy testing, monitoring, and development. Until then, the BLM had an interim wind energy policy, issued in 2002.

In anticipation of submission of an Interconnection Agreement (IA), Sierra Pacific (doing business as NV Energy) conducted a System Impact Study (further confirmed by Nevada Power Transmission Personnel) that revealed up to 149.1 megawatts (MW) could be injected into the current Sierra Pacific 230-kilovolt (kV) line in Spring Valley, without any significant upgrades (network or otherwise) other than the proposed substation. In January 2006, Babcock & Brown (since acquired by Pattern Energy), through SVW, submitted an IA to Sierra Pacific and applied for a testing and monitoring ROW with the BLM. Since then, SVW has maintained anemometers to determine the suitability of the project for wind energy development.

In October 2007, SVW applied for a ROW grant from the BLM for Commercial Wind Energy Development Facilities, as described in IM 2006-216. The ROW application included a draft Plan of Development (POD) for the construction, operation, and maintenance of the 149.1-MW SVWEF and associated facilities. Additionally, a mineral materials permit would be issued for Gravel Pits A and B. The proposed SVWEF would be located in Spring Valley about 20 miles east of Ely, Nevada (Figure 1.1-1). Facilities for the Proposed Action would consist of 75 wind turbine generators (WTGs), an underground electrical collection system, a substation, a switchyard, an operations and maintenance (O&M) building, and access roads. The BLM determined that an EA was needed to determine whether the project would result in significant environmental impacts beyond those already disclosed in the NEPA documents discussed in Section 1.0. Studies as outlined in Section A.1 of the Wind Energy PEIS ROD (Attachment 1 of the IM [BLM 2005]) were completed and as information about wind resources and other resource impacts became available, extensive revisions were made to the POD to exploit the maximum wind potential while avoiding potential significant impacts.

In December 2008, the BLM issued IM 2009-043, Right-of-Way Management, Wind Energy, which updated the previous IM 2006-216. The updated IM provides guidance on issuing ROWs for wind energy testing, monitoring, and development, as well as clarifies BLM wind energy development policies and BMPs. SVW updated its POD to conform to Attachment 2 and Section 2 of Attachment 1 of the IM. The POD was tentatively finalized in October 2009 and will be finalized following completion of NEPA documentation prior to issuance of a DR.

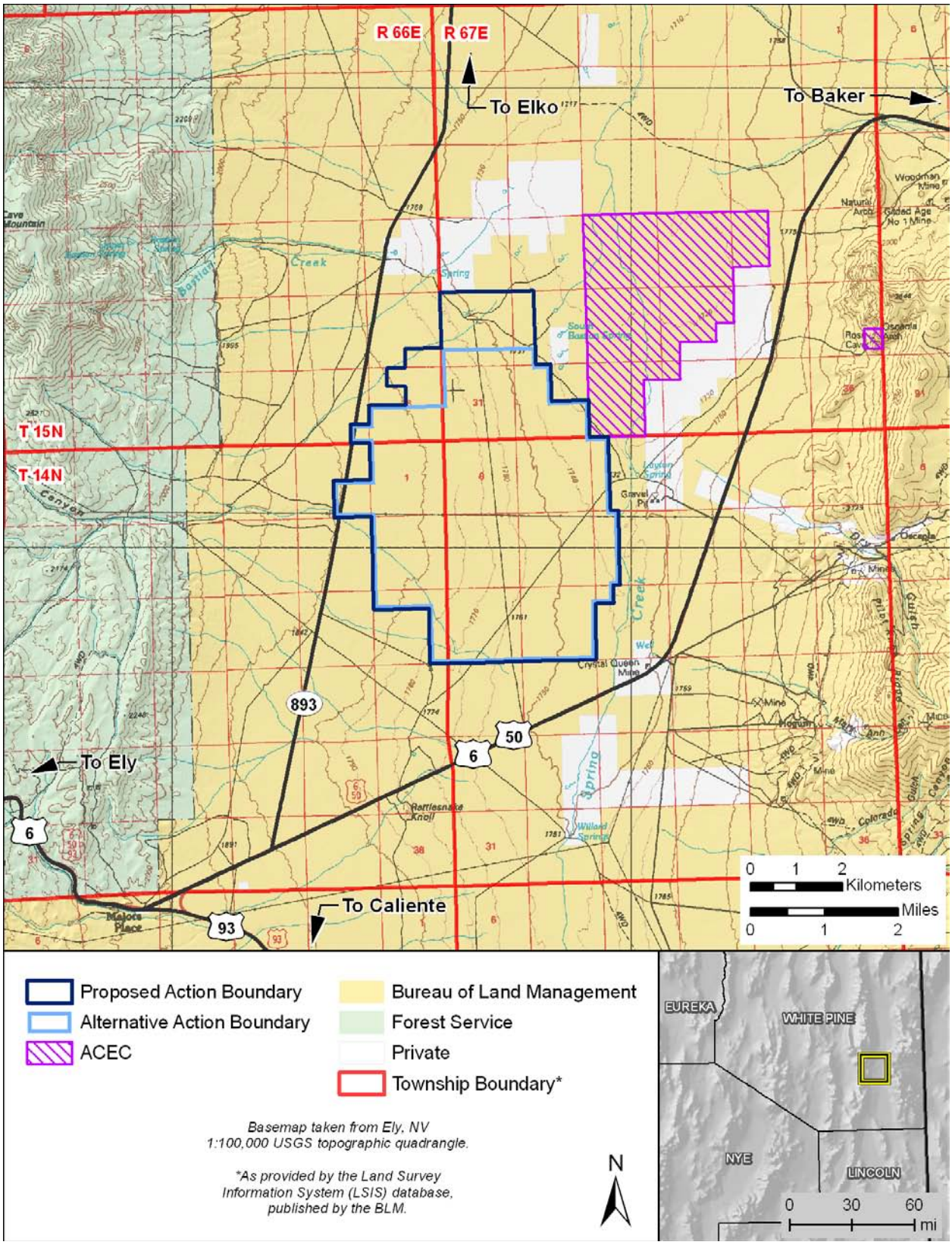

Figure 1.1-1. SVWEF location map.

Additionally, in June 2009 Department of the Interior Secretary Ken Salazar announced plans for BLM to "fast-track" renewable energy. The SVWEF is one of the projects listed as a fast-track project. Fast-track projects are those where the companies involved have demonstrated to the BLM that they have made sufficient progress to formally start the environmental review and public participation process. These projects are advanced enough in the permitting process that they could potentially be cleared for approval by December 2010, thus making them eligible for economic stimulus funding under the American Recovery and Reinvestment Act of 2009 (Recovery Act). Four Renewable Energy Coordination Offices, including two in Nevada, were formed to expedite processing these renewable energy project applications.

1.2 Purpose of and Need for Action

The BLM's purpose and need for the SVWEF Project is to respond to SVW's application under Title V of the Federal Land Policy and Management Act (FLPMA) (43 United States Code [USC] 1761) for a ROW grant to construct, operate, and decommission wind energy generation facilities and associated infrastructure in accordance with FLPMA, BLM ROW regulations, and other applicable federal laws. Additionally, the BLM has a need to respond to SVW's application for mineral materials sites (Gravel Pits A and B) and its application for the construction and operation of the Osceola switchyard. A separate ROW request would be made for the Osceola switchyard and associated facilities because following project construction the ROW grant may be assigned to NV Energy. Because these additional actions are in support of the SVWEF, they are defined as connected actions and must be analyzed under a single NEPA document. The BLM will decide whether to approve, approve with modification, or deny issuance of the ROW grants and permits to SVW for the proposed SVWEF, the proposed Osceola switchyard and associated facilities, and the proposed mineral materials sites, and if so, under what conditions.

SVW has applied to DOE for a loan guarantee under Title XVII of EPAct 05, as amended by Section 406 of the American Recovery and Reinvestment Act of 2009, Public Law (PL) 111-5 (the Recovery Act). DOE is a cooperating agency on this EA pursuant to a Memorandum of Understanding between DOE and BLM Nevada signed in March 2010. The purpose and need for action by DOE is to comply with its mandate under EPAct 05 by selecting eligible projects that meet the goals of the act.

The EPAct 05 established a federal loan guarantee program for eligible energy projects and was amended by the Recovery Act to create Section 1705 authorizing a new program for rapid deployment of renewable energy projects and related manufacturing facilities, electric power transmission projects, and leading-edge biofuels projects. The primary purposes of the Recovery Act are job preservation and creation, infrastructure investment, energy efficiency and science, assistance to the unemployed, and state and local fiscal stabilization. The Section 1705 Program is designed to address the current economic conditions of the nation, in part, through renewable energy, transmission, and leading-edge biofuels projects.

On August 2, 2010, John Hancock Life Insurance Company, as Lender-Applicant, with SVW, submitted an application to the DOE Loan Guarantee Program for a federal loan guarantee for the wind energy generation facility in response to DOE's October 7, 2009, solicitation, "Federal Loan Guarantees for Commercial Technology Renewable Energy Generation Projects under the Financial Institution Partnership Program." For this solicitation, DOE is implementing the application process by directly working with certain qualified financial institutions through a set of procedures established by DOE as its Financial Institution Partnership Program (FIPP). In general, the FIPP is intended to expedite the loan guarantee process and expand senior credit capacity for the efficient and prudent financing of eligible projects under Section 1705 of Title XVII that use commercial technologies. This objective will be primarily accomplished by additional roles defined for certain financial institutions satisfying applicable qualifications set forth by DOE. Under the FIPP program, proposed borrowers and project sponsors may

not apply directly to DOE but must instead work with a financial institution that meets DOE qualification as a Lead Lender.

DOE will decide whether to grant a loan guarantee to SVW to finance the construction and startup of the proposed SVWEF. DOE's regulations guiding its decision are at 10 Code of Federal Regulations (CFR) Part 1021, NEPA Implementing Procedures.

Recent national and regional electrical demand forecasts have predicted that the growing consumption of electrical energy would increase in the foreseeable future and would require development of new resources to satisfy this demand. The DOE Energy Information Administration (EIA) has forecast a 23.0% growth in electricity sales by 2030, including a projected increase of 19.8% in the residential sector, 38.3% in the commercial sector, and 7.1% in the industrial sector. This growth would require an increase in generating capacity of 231 gigawatts (231,000 MW) nationwide by the year 2030 (EIA 2009).

There is growing interest and support for the development of new wind energy resources in the United States. Wind energy is now second only to natural gas plants in new power generation capacity added between 2005 and 2007. Additionally, up to 7,500 MW of new capacity has been added in 2008, contributing at least 35% of new power generation capacity (American Wind Energy Association 2009).

Executive Order (EO) 13212, signed in 2001, states that the production and transmission of energy in a safe and environmentally sound manner is essential to the well-being of the American people. A DOE report postulates that wind power can provide 20% of the nation's electricity by 2030 (DOE 2008). The DOE report finds that achieving a 20% wind contribution to U.S. electricity supply would:

- Reduce carbon dioxide emissions from electricity generation by 25% in 2030;
- Reduce natural gas use by 11%;
- Reduce water consumption associated with electricity generation by 4 trillion gallons by 2030;
- Increase annual revenues to local communities to more than $1.5 billion by 2030; and
- Support roughly 500,000 jobs in the United States, with an average of more than 150,000 workers directly employed by the wind industry.

Additionally, the State of Nevada has recognized the need for new and diverse energy resources, including renewable energy generation options. The Nevada Renewable Portfolio Standard (RPS) (Nevada Revised Statutes [NRS] 704.7821) was revised on July 1, 2009, by Senate Bill 358 to state that by calendar year 2025 no less than 25% of the total amount of electricity sold by NV Energy to its retail customers in Nevada must be from renewable energy resources. NV Energy is expecting to acquire renewable energy from multiple generating facilities to meet, at a minimum, the mandated RPS target of 12% of retail sales coming from renewable resources in 2009–2010, 15% in 2011–2012, 18% in 2013–2014, 20% in 2015–2019, 22% in 2020–2024, and 25% in 2025.

As part of meeting the Nevada RPS, NV Energy has entered into a Power Purchase Agreement (PPA) with SVW to purchase 149.1 MW of wind energy produced from the SVWEF if it is constructed. Therefore, an additional purpose of this project is to meet the need to fulfill the production of 149.1 MW as required under the PPA.

1.3 Preliminary Issues

Coordination with relevant stakeholders (agencies or groups identified as having jurisdiction or special resource knowledge) was conducted in order to identify potential issues of concern relating to the development of the SVWEF. As a result of a stakeholder meeting conducted on October 20, 2008, and a BLM interdisciplinary scoping meeting conducted on March 9, 2009, with BLM and the Nevada

Department of Wildlife (NDOW), the following issues were identified warranting further review to determine whether they require detailed analysis.

- Concerns regarding whether geotechnical studies and excavation for turbine foundations associated with the alternatives would affect the water source for vegetation in the Swamp Cedar Area of Critical Environmental Concern (ACEC) were raised.
- Concerns were expressed that the proposed wind energy facility would impact pronghorn antelope (*Antilocapra americana*) habitat.
- Concerns were expressed that the proposed wind energy facility would impact bird and bat species in Spring Valley.
- Concerns were expressed that the proposed wind energy facility would impact the Southwest Intertie Project (SWIP) 500-kV utility corridor.
- Concerns were expressed that the proposed wind energy facility would impact the Bastian Creek range restoration project, completed in 2007.
- Concerns were expressed that the proposed wind energy facility would impact grazing uses in the Majors and Bastian Creek Allotments.
- Concerns were expressed that the proposed wind energy facility would impact recreation opportunities and the physical and social setting of the Loneliest Highway Special Recreation Management Area (SRMA).
- Concerns were expressed that the proposed wind energy facility would impact greater sage-grouse (*Centrocercus urophasianus*) habitat and active leks around the project area.
- Concerns were expressed that the proposed wind energy facility would impact pygmy rabbit (*Brachylagus idahoensis*) habitat.
- Concerns were expressed that the proposed wind energy facility would impact the viewshed of Great Basin National Park (GBNP).
- Concerns were expressed that the proposed wind energy facility would impact the visual integrity of the historic values in Spring Valley.
- Concerns were expressed that the proposed wind energy facility would exceed the BLM Visual Resource Management (VRM) objectives for the project area.
- Concerns were expressed that the proposed wind energy facility would result in potential impacts to Native American burial sites.
- Concerns were expressed that the proposed wind energy facility would result impacts to the E ½ of Section 12 within the proposed project area, which has been classified for Desert Land Entry (BLM 2008b).

These issues have been addressed in Chapter 3, Affected Environment, and, as necessary, Chapter 4, Environmental Consequences.

2.0 PROPOSED ACTION AND ALTERNATIVES

The previous chapter presented the purpose of and need for the proposed project, as well as the preliminary issues and concerns identified as needing additional review. To meet the purpose of and need for the proposed project and resolve the issues identified, the BLM has determined that the Proposed Action, one Alternative Action, and a No-Action Alternative are necessary for detailed analysis. The potential environmental consequences from the Proposed Action, Alternative Action, and No-Action alternatives are analyzed in Chapter 4 for each of the necessary resources identified in Chapter 3.

BLM's approach to developing alternatives for the SVWEF was based on those issues and resources of concern identified during site specific studies, BLM internal scoping, stakeholder presentations, and the public comment period on the initial draft EA. Additionally, the wind energy potential and the need defined by the power purchase agreement were considered. The Proposed Action was developed by the SVW and the BLM following completion of wind studies and required environmental studies. The Proposed Action was developed to avoid issues identified during completion of environmental studies and BLM scoping, as well as to take advantage of wind energy potential. The Alternate Development Alternative was developed following the public comment period on the initial draft EA. Under this alternative, the overall project area boundary was reduced in size; the northernmost array of WTGs was removed, and WTGs were added to the remaining arrays in order to avoid sensitive resources identified in the north of the project area and to continue to meet the needs of the PPA with NV Energy.

Each alternative meets the purpose and need for the project and includes 75 WTGs in order to achieve the 149.1 MW required by the PPA with NV Energy. Each alternative also includes a need for the mineral materials permit and their ROW request for the Osceola switchyard. The BLM has identified the Alternate Development Alternative as its preferred alternative.

DOE's Proposed Action is to grant a loan guarantee to John Hancock Life Insurance Company, as Lender-Applicant, with SVW for construction and startup of the SVWEF and to comply with its mandate under EPAct 05 by selecting projects that meet the goals of the act.

2.1 Proposed Action

SVW proposes to construct, operate, and maintain a 75-WTG wind generation facility within the approximately 8,565-acre project area; short-term disturbance would total approximately 336.9 acres, and long-term disturbance would total 111.1 acres. The SVWEF would produce up to 149.1 MW that would go into the existing NV Energy system. The Proposed Action consists of the construction, operation, and decommissioning of WTGs and associated facilities necessary to successfully generate the 149.1 MW allowed under the IA and agreed to in the PPA. If approved, the BLM would grant a long-term 30-year ROW for the project. After which time, the project would either be decommissioned or the applicant could request an extension, which would require consideration of additional NEPA compliance requirements. A short-term mineral materials permit would also be issued for Gravel Pits A and B.

The Proposed Action incorporates the requirements of all applicable federal, state, and local laws, regulations, and permits, as specified in the POD. The Proposed Action also incorporates all applicable mitigation measures in Chapter 5 of the PEIS (BLM 2005 [summarized in Table 6.2-1]) and Section 3 of the BLM RMP/FEIS (BLM 2008a). Design measures are included in the Proposed Action to reduce the impacts to sensitive resources. These built-in measures include stormwater pollution prevention measures, weed control, proper waste disposal, and approved revegetation and reclamation methods; these are discussed in the POD and presented as an integral part of the Proposed Action.

2.1.1 Wind Energy Facility Construction

Construction of a wind project would be performed in accordance with applicable codes, laws, and engineering requirements. The actual long-term ground disturbance of the WTGs and plant infrastructure (civil and electrical) would be approximately 1.3% of the total project area. Construction begins with installation of civil improvements, including site laydown areas for turbine and tower deliveries, access roads, underground runs for electrical cabling, turbine foundations, and crane pads for erection of the turbines. The second construction phase, in which some of the work would proceed in parallel with the civil works, includes installation of the electrical hardware (including cabling), construction of the Osceola switchyard, Spring Valley substation and pad-mount transformers, O&M building, and erection of the turbines. The third and final construction phase includes mechanical completion of all WTGs, substation and switchyard, and other facilities, followed by commissioning and testing of each turbine, utility interconnection, testing of the electrical system, and restoration of temporary construction areas, laydown areas, and turbine crane pads. Table 2.1-1 outlines a general construction schedule for the project.

Table 2.1-1. Anticipated Project Construction Schedule

Task	Schedule
Engineering work starts	3rd quarter 2010
Construction mobilization	4th quarter 2010
Commence civil works (roads, underground electrical, foundations)	4th quarter 2010
Turbine deliveries commence	2nd quarter 2011
Main power transformer delivered	2nd quarter 2011
Turbine deliveries completed	3rd quarter 2011
Substation and switchyard completed	3rd quarter 2011
Turbine commissioning, testing, and commercial operation	3rd quarter 2011
Wind energy facility commercial operation date	4th quarter 2011

2.1.1.1 WIND ENERGY FACILITY COMPONENTS

The principal components of the SVWEF would consist of WTGs, an underground electrical collection system for collecting the power generated by each WTG, an electrical substation and switchyard, access roads, an O&M building, temporary laydown and storage areas, a concrete batch plant, a sand and gravel source, fiber-optic communications, one permanent meteorological (MET) tower, three radar units, and two microwave towers. The short-term (the period from beginning of construction until reclamation) and long-term disturbance (the duration of the project) areas for each of these components are described in Tables 2.1-2 and 2.1-3. The project area totals 8,565 acres, all of which are on BLM land covered by the requested ROW for the Proposed Action. This is to allow for the necessary set back distances and spacing between individual WTGs and linear arrays. The total area estimated for use by the wind energy facility (including both short- and long-term disturbance) is 448.0 acres, or 5.2% of the total ROW.

Table 2.1-2. SVWEF Components: Maximum Short-Term Disturbance Summary Table, Based on Construction of the Proposed Action

Facility Component	Disturbance Length (feet)	Disturbance Width (feet)	Short-Term Disturbance (acres)	% Project Area
Turbine foundations and crane pads (×75)	400[1]	N/A	217.5	0.025
Laydown, batching plant, and parking area	820	530	10.0	0.001
Access roads	146,939	40	134.9	0.016
Collection system	143,450	20	65.9	0.008
Fiber-optic line[2]	390	20	0.18	NA
Radar fiber-optic line	500	20	0.23	0.000
Gravel Pits A & B and access[3]	660	660	10.0	0.001
Footprint overlap[≠]	N/A	N/A	−101.85	−0.012
Total			**336.9**	**0.039**

[1] This measurement represents the diameter of the disturbance area.

[2] Outside project area but contributes to overall disturbance footprint.

[3] 10.0-acre Gravel Pit B is an offsite existing disturbance and is not included in the overall disturbance acreage.

[≠] Overlap is the intersection of two different component disturbance areas and is therefore removed from the total disturbance. For example, a temporary turbine work area may partially overlap the collection system. In that case, the overlapping turbine acreage has been subtracted in order to not double-count disturbance.

Table 2.1-3. SVWEF Components: Maximum Long-Term Disturbance Summary Table, Based on Construction of the Proposed Action

Facility Component	Disturbance Length (feet)	Disturbance Width (feet)	Long-Term Disturbance (acres)	% Project Area
Turbine foundations and crane pads (×75)	75[1]	N/A	22.5	0.003
Access roads (add 2 radar access roads – 0.23 acre each)	146,939	28	95.0	0.011
MET tower	50[1]	N/A	0.1	0.000
Spring Valley substation, Osceola substation, and O&M building (includes two microwave towers)	1,080	805	20.0	0.002
Radars	25	35	0.02	0.000
Fence[2]	34,470	12	9.5	NA
Footprint overlap[≠]	N/A	N/A	-36.0	-0.004
Total			**111.1**	0.013

[1] This measurement represents the diameter of the disturbance area.

[≠] Overlap is the intersection of two different component disturbance areas and is therefore removed from the total disturbance. For example, a temporary turbine work area may partially overlap the collection system. In that case, the overlapping turbine acreage has been subtracted in order to not double-count disturbance.

[2] Outside project area but contributes to overall disturbance footprint.

2.1.1.2 PRECONSTRUCTION AND CONSTRUCTION ACTIVITIES

An overview of construction activities necessary for the development of a wind energy project is described in BLM's PEIS (BLM 2005). The following preconstruction and construction activities are specifically relevant to the proposed SVWEF.

2.1.1.2.1 Geotechnical Investigations

Geotechnical investigations have been completed within the project area to confirm constructability and identify gravel sources (Kleinfelder 2009a, 2009b). Prior to construction, additional geotechnical

investigations would be completed at each turbine location, and throughout the project area as needed, to identify any site specific construction issues and prepare final foundation design and necessary BMPs. Vehicle travel for geotechnical investigation would occur on existing roads and would require minimal drive and crush for no more than 0.25 mile from existing roads.

2.1.1.2.2 Site Preparation

The center point, centerline, and exterior limits of the principal components of the SVWEF would be surveyed and clearly marked by stakes and flagging at 200-foot intervals, or closer if necessary to maintain a sight line. Construction activities would be confined to these areas to prevent unnecessarily impacting sensitive areas. Stakes and flagging that are disturbed during construction would be repaired or replaced before construction continues. Stakes and flagging would be removed when construction and restoration are completed.

A 3.6-mile-long (19,245-foot-long) fence would be constructed outside the northeast corner of the project area to keep cattle in the Bastian Creek Allotment from entering the project area during construction and rehabilitation. This would include a fence surrounding the adjacent Southern Nevada Water Authority (SNWA) 80-acre parcel, which would be used as a "water lot" to allow better management of the water source on its property. The lot would have access gates from inside and outside the property. The new fence would also skirt the edge of the Swamp Cedar ACEC to the south and east and tie in with existing fences associated with management of the grazing allotment. The fence would be a standard BLM four-wire fence built to meet specifications for cattle and wildlife (BLM Manual 1737). Fence construction would involve the use of pick-up trucks and post-hole diggers attached to a tractor. No new road construction would be included for the fence, but a two-track route parallel to the fence would result from repeated travel.

On the west side of the project area, a 5.6-mile-long (29,329 foot-long) fence would be constructed to connect with existing fences in order to keep cattle in the Majors Allotment from entering the project area during construction and rehabilitation. The fence specifications would be the same as those for the Bastian Creek fence described above.

Vegetation would be mowed to become part of the salvaged topsoil. Vegetation clearing would be accomplished using bulldozers, road graders, or other standard earth-moving equipment. Vegetation would be cleared from temporary use areas for the laydown area, crane pads, and access roads. In all areas of short- and long-term disturbance where vegetation would be mowed, all available topsoil would be removed and then bermed around temporary construction areas. Topsoil from permanently disturbed areas would be removed and stored at other locations where it can be seeded and used for interim reclamation purposes. Stockpiles would be seeded in the interim with a BLM-approved seed mix to prevent weeds and help with reclamation success and would be maintained for final reclamation purposes. In temporarily disturbed areas where the ground is relatively flat, equipment would be laid on top of the mowed vegetation and would not require any grading.

2.1.1.2.3 Wind Turbine Layout, Installation, and Construction Processes

Since wind turbine technology is continually improving and the cost and availability of specific types of turbines vary from year to year, a representative range of turbine types that are most likely to be used for the project are listed in Table 2.1-4. Seventy-five turbine sites have been identified that provide not only the highest wind speeds but also the most consistent wind resource, which provides the highest overall energy output and reliability. Figure 2.1-1 presents the site layout for all 75 turbines and associated infrastructure. Each turbine experiences a small percentage of parasitic load, meaning that each turbine typically consumes between 5 and 10 kilowatts of power during operation. Additionally, a small amount

of power is consumed by the substation, further reducing the amount of power available for output. Therefore, no matter which turbine is selected, no more than the maximum 149.1 MW agreed to under the PPA would be output into the system and somewhat less than that amount may be produced if the 1.8-MW turbines were selected.

Table 2.1-4. Wind Turbine Specifications

Turbine	Hub Height	Rotor Diameter	Total Height	Rated Capacity Wind Speed	Rotor Speed	Tower Base Diameter
2.3-MW Siemens	80 m	101 m	130.5 m	12–13 m/s	6–16 rpm	14.76 feet (4.5 m)
2.0-MW Gamesa G90/G97	78 m	90 m / 97 m	125 m / 126.5 m	15 m/s	9–19 rpm	13 feet (4 m)
RePower 2.0	80 m	92.5 m	126 m	12 m/s	9–18 rpm	13 feet (4.0 m)
1.8-MW V90 Vestas	80 m	90–100 m	125 m	12 m/s	9–14.9 rpm	< 15 feet

Notes: m/s = meters per second; rpm = rotations per minute.

Turbines would be placed in a series of east-west-oriented rows (or arrays) to best use Spring Valley's north-south wind flows. North-south-oriented rows cannot be used because they would reduce power generation to levels that the project would no longer be commercially viable. Turbines within each array would be connected by gravel surface access roads and underground 34.5-kV collection circuits. To minimize downwind array losses, spacing between turbine rows would be at least 10× rotor diameters (RD) (1,010 m) and 2.4 to 3.5 RD (242–354 m) for in-row spacing. Turbine towers and foundations would be designed to survive a gust of wind more than 133.1 miles per hour (mph) with the blades pitched in their safest position. Turbine blade tip speed is variable and would not exceed 90 meters per second (m/s) or 201 mph. Turbine foundations would be approximately 8 feet deep, with a projection of approximately 6 inches above final grade, and would use approximately 350 cubic yards of concrete. Each tubular steel tower would have a maximum 15-foot-diameter (4.5-m-diameter) base.

Three to five WTGs can be erected weekly. Typically, construction would occur during the weekday between sunup and sundown (approximately 6 a.m. to 6 p.m.). However, if schedule delays occur, work may be extended into the weekend or overnight. If work is completed overnight, temporary lighting would be used in the immediate work areas. Construction is expected to commence in the later part of 2010, with the final mechanical completion, commissioning, and testing expected to be completed by the third quarter of 2011.

Each turbine would require a 400-foot-diameter (2.9-acre) temporary construction area, including all topsoil berms, and a permanent 75-foot-diameter (0.3-acre) area for the tower within the temporary construction area. Clearing and grading would be accomplished using bulldozers, backhoes, and road graders.

The temporary work area for each site would be used for the crane pad, equipment laydown, and other construction-related needs. Within the area of temporary disturbance, an area of 75 × 150 feet with a maximum slope of 1% is required to support the crane used in lifting and erecting the turbine components. The crane pad would not be surfaced with concrete but would be compacted to provide a stable base for safe operation of cranes. To meet the necessary compaction standards as determined by geotechnical studies, it may be necessary for heavy weights to be dropped on the pad, and graders and bulldozers may be used to achieve the required levels and grades.

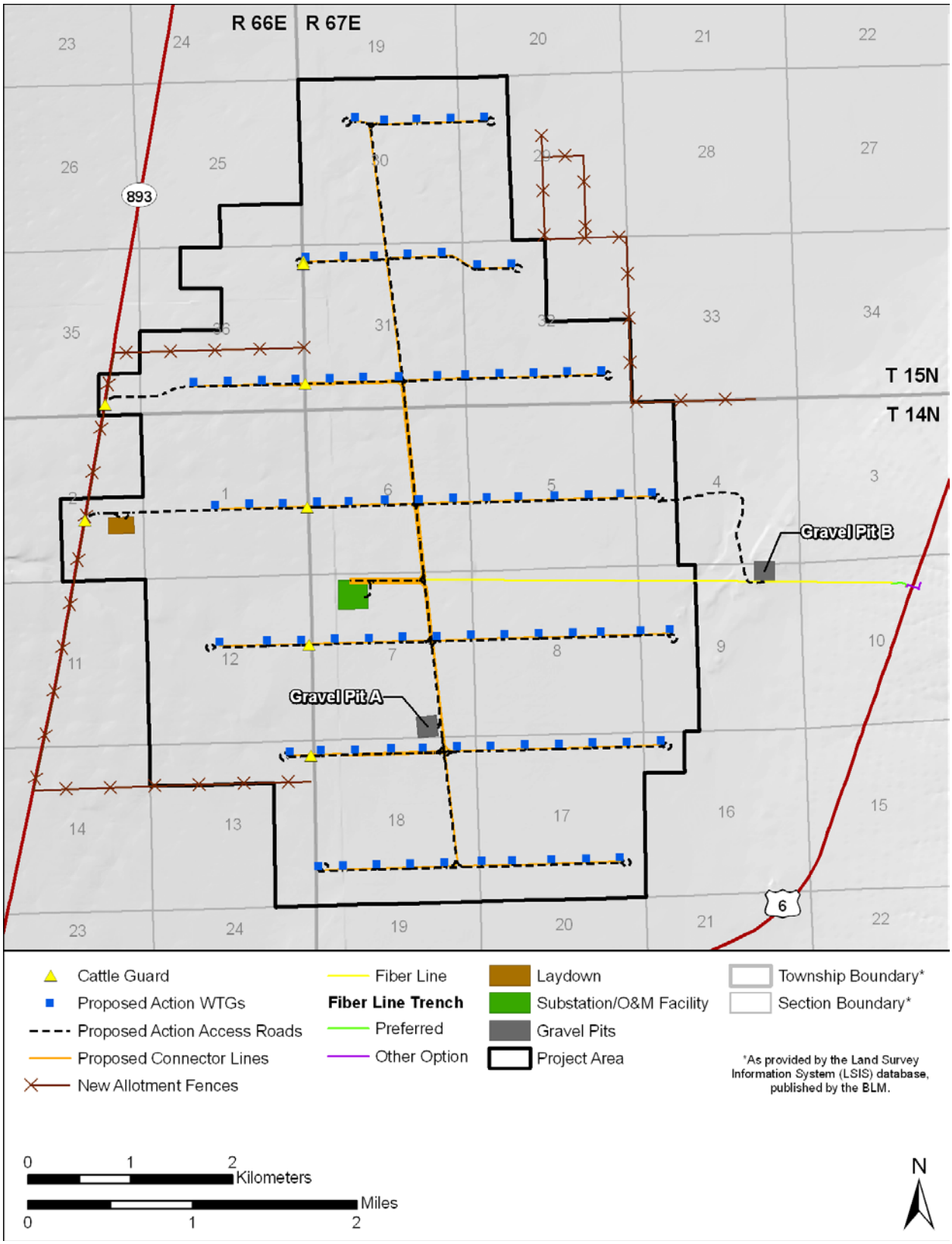

Figure 2.1-1. Proposed Action site layout.

Within the temporary construction area, permanent foundations are excavated, compacted, and constructed of structural steel and reinforced concrete designed to meet turbine supplier and geotechnical engineer's recommendations. The WTGs' freestanding tubular towers would be connected by anchor bolts to the concrete foundation at the pedestal. The towers would have a maximum 15-foot-diameter base. The area immediately surrounding the concrete pedestal would be covered with a gravel ring, followed by roads to provide a stable surface for future maintenance vehicles accessing the turbine and as required by electrical codes. After construction, all temporary disturbances associated with the turbine installation would be reclaimed as described in Appendix A, Restoration and Weed Management Plan. Additionally, gravel would be removed from temporary use areas and disposed of in an approved landfill or used for fill in other parts of the project area as appropriate.

2.1.1.2.4 Wind Turbine Components and Assembly

WTGs consist of three main components: the turbine tower, the nacelle, and the rotor, which consists of the hub and the blades. The nacelle is the portion of the wind turbine mounted at the top of the tower, and it houses the generator, converter, gearbox, and electronic control systems. Turbine hub heights and RD for the potential turbines may vary but for purposes of analysis would not exceed the 2.3-MW turbine specifications.

The towers would be a tapered tubular steel structure manufactured in three or four sections, depending on the tower height, and approximately 15 feet (4.5 m) in diameter at the base. The towers would be the manufacturer's standard off-white/matte gray color. A service platform at the top of each section would allow for access to the tower's connecting bolts for routine inspection. A ladder inside the structure would ascend to the nacelle to provide access for maintenance. The tower would be equipped with interior lighting and a safety glide cable alongside the ladder. The towers would be fabricated and erected in sections.

The nacelle steel-reinforced fiberglass shell houses the main mechanical components of the WTG; the drive train, gearbox, and generator control the electronics and cables. The nacelle would be equipped with an anemometer that signals wind speed and direction information to an electronic controller. A mechanism would use electric motors to rotate the nacelle and rotor to keep the turbine pointed into the wind to maximize energy capture.

Modern wind turbines have three-bladed rotors. The diameter of the circle swept by the blades would be no more than 323 feet (101 m). If the maximum number of 75 turbines were constructed, a total rotor-swept area of 600,584.3 m^2 (148.4 acres) would be used. Generally, larger WTGs have slower rotating blades, but the specific rotation per minute (rpm) values depend on aerodynamic design and vary between machines. Based on the turbines considered, the blades would turn at no more than 19 rpm.

Each turbine is equipped with a state-of-the-art control system to monitor variables such as wind speed and direction, air and machine temperatures, electrical voltages, currents, vibrations, blade pitch, and yaw (side-to-side) angles.

Power generation controlled at the bus cabinet inside the base of the tower include operation of the main breakers to synchronize the generator with the grid as well as control of ancillary breakers and systems. The control system would always operate to ensure that the machines operate efficiently and safely.

Each turbine would be connected to a central Supervisory Control and Data Acquisition (SCADA) system. The SCADA system allows for controlling and monitoring individual turbines and the wind energy facility as a whole from a central host computer or a remote personal computer. The SCADA system transmits critical information from the turbine via fiber optics to a central control server located in

the O&M building and to all other locations as required. The SCADA system would also send signals to a fax, pager, or cell phone to alert operations staff.

Turbines would be equipped with a braking system to stop or release the rotor. The braking system is designed to bring the rotor to a halt under all foreseeable conditions. The turbines also would be equipped with a parking brake used to keep the rotor stationary during maintenance or inspection.

2.1.1.2.5 Temporary Construction Workspace, Yards, Materials Storage, and Staging Areas

One 10-acre temporary laydown area with a batch plant and parking area would be required to stage and store construction equipment and materials, to prepare concrete, and for construction staff parking (see Figure 2.1-1). During construction, the laydown area would be fenced and gated to control access. Micrositing would be completed as practicable to avoid winterfat (*Krascheninnikovia lanata*) dominated sites. The laydown area may be graveled, depending on the soil conditions and project needs. After construction, all temporary disturbances associated with the laydown area would be reclaimed.

2.1.1.2.6 Access Roads

The project scope would include a network of 28-foot-wide roads that would provide access to each turbine location, the substation, the switchyard, the MERLIN radar systems, and the project's O&M building. During the course of construction, access roads would have an additional temporary disturbance of up to 40 feet (68 feet wide total) to facilitate the travel of large trucks and cranes. These disturbed areas would be graded and compacted for use and then decompacted and stabilized at the conclusion of the project. Whenever possible, such as the main north-south access road, existing roads would be used and improved to avoid additional disturbance. In addition to the crane travel paths, the underground collection system and fiber-optic lines would also parallel the access roads. Micrositing of access roads would be completed as practicable to avoid winterfat-dominated sites.

Public access roads would incorporate existing BLM standards regarding road design, construction, and maintenance such as those described in the 2005 PEIS/ROD (BLM 2005), BLM Manual 9113 (BLM 1985), and the *Surface Operating Standards for Oil and Gas Exploration and Development* (i.e., the Gold Book) (U.S. Department of the Interior and the U.S. Department of Agriculture 2007). All roads would be built at ground level. Additionally, any public access roads would conform to all applicable county road regulations, as well as the Nevada State Fire Marshal's fire safety regulations. Roads would not be closed to the public except during construction for safety purposes. Off-road travel is prohibited in the area and would not be allowed during any portion of the project.

A new, long-term, approximately 0.5-mile-long site access road to the first WTG in that WTG array would be constructed approximately 0.3 mile from the existing transmission line access road; a second permanent access road, approximately 0.6 mile long, to the first WTG in that WTG array would be constructed approximately 0.7 mile north of the primary access road. During the construction phase of the project, site and turbine access roads would be up to 68 feet wide to facilitate the travel of large trucks and heavy equipment, ditching, and topsoil storage. This would be reduced to 28 feet after construction is completed to include the permanent driving surface and ditches for maintenance access during the operations phase; the remaining 40-foot-wide area of short-term disturbance would be reclaimed. The two long-term site access roads would enable construction and post-construction operational personnel to easily access the center and northern sections of the project area, including the Spring Valley substation and Osceola switchyard.

There would be up to a total of 27.8 miles of new access roads, including the two site access roads described above and the turbine access roads. All new access roads where a crane walk would be required would be 68 feet wide during the construction phase and 28 feet wide during the operations phase and would include a turnaround at the end of each turbine array to allow for large-vehicle maneuvering. Access roads for gravel pits (1.1 miles) would be along existing roads that would be improved, with a maximum expansion to 28 feet wide. Portions of the road exclusively for gravel pit access would be reclaimed entirely. Remaining sections of road that would be used for other purposes such as administrative access would be restored back to their original condition. There would be up to 95.0 acres of disturbance from new road construction that would not be restored until after decommissioning. The final long-term roads would be compacted and surfaced with gravel aggregate from BLM-permitted sources.

All roads would remain for the life of the project; however, road widths would be reduced to 28 feet through restoration activities following construction as described above. There are four locations where access roads cross the existing allotment fence line. Cattle guards would be installed at each of these fence line crossings. Cattle guards or gates would also be placed along the new fence line at access roads into the project area from State Route (SR) 893. After decommissioning, project roads would be reclaimed unless they are being used for other permitted activities.

2.1.1.2.7 Electrical System

The existing NV Energy 230-kV transmission line, which passes from east to west through the project site, would be the primary power transmission line for the SVWEF. A 34.5-kV underground electrical collector system would be installed to connect the turbines to the Spring Valley substation. The power would be stepped up by the main transformer at the Spring Valley substation to a 230-kV high-voltage (HV) system. The HV system would then be interconnected to the Osceola switchyard and the grid. For the connection of the Osceola switchyard to the existing transmission line, there would be a 400-foot overhead span from the existing transmission line connecting to the Osceola switchyard. In addition, there would be a 70-feet overhead span (no poles would be required) connecting the Osceola switchyard to the Spring Valley substation. Approximately 27.2 miles of collector cables would be placed underground in trenches that are adjacent to access roads. Along turbine strings, between one and two trenches would be used to place collector cables. Trenches would be placed on one or both sides of the access road, 30 feet from the road centerline as needed. Along the north-south road alignment, between two and four trenches would be used to place collector cables; two trenches would be on either side of the access road with the first trench 30 feet from road centerline and the second trench 50 feet from road centerline. Along the stub road from the north-south collectors to the substation, seven trenches would be needed. Temporary disturbance for trenches would be up to 20 feet wide (to accommodate trenching and stockpiling) and 3 to 5 feet deep. The total temporary disturbance for the collection system would be 65.9 acres. Following placement of the cables in the trenches, the trenches would be backfilled, any topsoil set aside during excavation would be placed on top, and the area would be restored as described in the Restoration and Weed Management Plan (see Appendix A).

Vaults and splice boxes would be placed aboveground at locations as needed. There would be several aboveground junction boxes that would be used in various locations. Junction boxes are approximately 4 feet wide × 6 feet long × 4 feet high.

Additionally, the primary north-south access road would cross under the current power line corridor that runs east to west across the project area. The power line corridor contains four lines; one 230-kV transmission line owned by NV Energy, one 230-kV transmission line owned by Los Angeles Department of Water and Power, one 69-kV transmission line owned by Mt. Wheeler Power, and one low-voltage distribution line owned by Mt. Wheeler Power. Depending on the final roadway design and elevations,

one or more of these lines may need to be elevated to provide adequate vertical clearance over cranes, concrete trucks, and other construction equipment. To raise the conductors, new structures may be installed near the road, or existing structures may be replaced with taller poles. Temporary ground disturbance would be approximately 7 square feet and permanent ground disturbance would be approximately 3.5 square feet for each pole installed. The maximum number of new poles required would be approximately eight for a total of 0.001 acre of temporary disturbance and 0.0006 acre of permanent disturbance.

Spring Valley Substation

A 280 × 415–foot substation would be located adjacent to the O&M building within the 20-acre facility area. A 230-kV aboveground connector transmission line would connect the Spring Valley substation to the Osceola switching station, which would then connect to the NV Energy 230-kV transmission line. No disturbance outside the 20-acre facility area is expected. Construction of this substation would last approximately four to six months and would involve two primary stages: 1) site preparation and 2) structural and electrical construction.

Construction of the substation would begin with clearing of vegetation and organic material from the site. The site would then be graded to subgrade elevation; exporting and importing of suitable materials may be necessary. Structural footings and underground utilities, along with electrical conduit and grounding grid, would be installed, followed by aboveground structures and equipment. A chain-link fence would be constructed around the new substation for security and to restrict unauthorized persons and wildlife from entering the substation. The site would be finish graded and gravel surfaced, and reclamation would be completed to minimize the visual appearance of the substation.

Control buildings would be added to the substation and would more than likely be constructed of prefabricated material. Major equipment to be installed inside the control buildings would consist of relay and control panels, alternating current and direct current load centers to provide power to equipment inside and outside the control building, a battery bank to provide a back-up power supply, a heating/cooling system to prevent equipment failure, and communications equipment for remote control and monitoring of essential equipment.

Steel structures would be 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. Structures would be fabricated from tubular steel and galvanized or painted a BLM-approved color to blend in with predominant vegetation and soil types. Structures would be grounded by thermally welding one or more ground wires to each structure.

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

Control cables would be 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 would be set to the proper settings, and all equipment would be tested before the transmission line is energized.

Osceola Switchyard

The Osceola switchyard would be constructed adjacent to the Spring Valley substation within the 20-acre facility area. Clearing and grading for the substation would also be used for the Osceola switchyard. The BLM would issue a separate ROW grant for the switchyard and associated facilities, which would be

transferred from SVW to NV Energy after construction. This switchyard would be 510 × 360 feet. This switchyard would connect to the existing NV Energy 230-kV line and would not be decommissioned with the rest of the project. Construction of this switchyard would last approximately seven to 10 months and would involve the same two primary stages (site preparation and structural and electrical construction) as were previously described for the Spring Valley substation; however, reclamation is not anticipated for this site.

Associated with the switchyard, NV Energy would need to reconfigure the existing 230-kV transmission line directly north of and adjacent to the Osceola switching station by installing two new single pole angle structures and modifying two existing two-pole tangent structures. This work would include excavations for two poles (14 square feet temporary; 7 square feet permanent) and eight anchors (200 square feet temporary; negligible permanent). Modifications to the existing tangent structures would not require any ground clearing, grading, or excavation, but drive and crush of vegetation would be completed by the line trucks setting up next to the structures. Total temporary disturbance for reconfiguration of the current transmission line would be 0.005 acre and permanent disturbance would total 0.0002 acre. All reconfiguration work would be performed within the existing transmission line easement.

2.1.1.2.8 Communications System Requirements (Microwave, Fiber Optics, Hard Wire, Wireless, Radar)

Fiber-optic cable for communications between the turbines and the O&M facility would be necessary and would be placed in the collector system trenches. Following placement of the cables, the trench would be backfilled, any topsoil set aside during excavation would be placed on top, and the area would be restored.

A 100-foot-tall microwave tower would be located within the Osceola switchyard area. The tower would be placed where it has a direct line of site, and WTGs would not interfere with it. A fiber-optic cable would be placed on NV Energy's 230-kV line structures from the Osceola switching station, east to the last structure on the west side of U.S. Route 6/50. New conduit would be installed to carry the fiber from this structure to an existing telecommunications vault on the west side of U.S. Route 6/50. The conduit would be placed in the 230-kV line ROW running east and then south in the telecommunications ROW to the existing vault on the west side of U.S. Route 6/50.

Two 9-foot-tall permanent on-site MERLIN radar units (radar units) would be installed to analyze the presence and movement of birds and bats within the project area. Radar units would be placed in the northeastern and southeastern portions of the project area. Micrositing of each unit would occur to minimize resource impacts, to ensure the greatest possible accuracy and overall coverage of the project area, and to maximize the ability of the radar units to detect bats from Rose Guano Cave prior to them reaching the project area. These radar units would run full time and be connected directly into the SCADA system so that radar data can be directly communicated to the turbines. Each radar unit would be placed on a 20 × 30–foot concrete pad with a 5-foot apron of gravel. A 4-foot-tall hurricane fence would be installed around each of the radar units. Both radar unit access roads would be 16 feet wide and approximately 500 feet long to connect to the nearest WTG access road. A fiber-optic cable would be buried in a trench within 20 feet of the access road and would connect to the nearest WTG collector system trench. Temporary disturbance for trenches would be up to 20 feet wide (to accommodate trenching and stockpiling) and 3 to 5 feet deep. The total temporary disturbance for the fiber-optic line would be 0.23 acre.

A mobile VESPER fixed-beam wertical profile radar would also be used to provide more detailed target categorization than the MERLIN radar system, specifically, differentiation and identification of birds, bats, and insect targets based on measurement of wingbeat frequencies as targets pass through the radar

beam. The location of the VESPER unit would be dynamic for the first several months of the study campaign and would be moved throughout the project area via pick-up truck. No new disturbance would be necessary; the VESPER unit would be placed on existing disturbance only.

Additionally, an infrared beam-break system or remotely accessible bat acoustic detector would be placed at the entrance of the Rose Guano Cave to provide more detailed bat arrival and departure data. The infrared beam-break system would be installed on a frame placed just inside the perimeter of the cave entrance. Alternatively, the acoustic detector device would be placed in a container near the cave entrance and would be solar powered, accessed remotely and wirelessly, and elevated on a pole if needed. The final selection of instrumentation and construction details would be determined after a site visit and assessment.

2.1.1.2.9 O&M Building

An O&M building within the 20-acre facility area would be located in the southern portion of the project area (see Figure 2.1-1). The O&M building and yard would be constructed to store critical spare parts and provide a building for the operations and maintenance services. A concrete foundation would be required for the maintenance facility, and the area immediately surrounding the building would be covered with gravel for vehicle parking. Any area within the fence not covered by concrete would be covered with gravel to minimize erosion and surface runoff. A permanent 7-foot-high security fence surrounding the O&M facility and directional lighting would be installed. A 100-foot-tall microwave tower would be sited within the 20-acre O&M facility area. The tower would be placed where it has a direct line of site to the communication provider's facilities. The tower would provide temporary and permanent communications for the O&M building and substation.

Because the 20-acre substation and O&M parcel lies near the northern edge of an alluvial fan drainage basin, the grading plan for the parcel would include a berm/levee around the west, north, and south sides. The west side of the berm would be approximately 5 feet above existing grade, tapering to 3 feet above existing grade along the north and south sides. The berm may feature a trapezoidal cross-section, 16 feet wide at the top width with 3:1 (H:V) side slopes along the outside embankment. Construction materials for the trapezoidal berm would include soil from excavation at the 20-acre substation parcel and erosion control features such as riprap or an alternative engineered erosion control product. The berm would be constructed to blend in color and texture with the existing, natural surroundings.

2.1.1.2.10 Gravel, Aggregate, and Concrete Needs and Sources

Construction of access roads, facility foundations, and temporary laydown areas associated with the Proposed Action would require access to sand and gravel. Up to 14,875 cubic yards of sand, 152,562 cubic yards of gravel, and 7,500 cubic yards of cement are expected to be used during the course of construction. Sand and gravel sources within and adjacent to the project area have been identified by a construction contractor and would be permitted through a mineral materials permit issued by the BLM.

Gravel and concrete aggregate would come from two 10-acre locations—one within the project area (Gravel Pit A) and one outside the project area (Gravel Pit B) (see Figure 2.1-1). Some rock materials for making concrete would be purchased from an existing stockpile location. The materials would be trucked to the batching plant and placed into stockpiles. Access to the site outside the project area would be along an existing road. The existing road would be widened to 28 feet to accommodate haul trucks for the project. Cement would be delivered on trucks from a source to be identified and stored in two to five silos on-site. Approximately 540 tons of 5,000 per square inch concrete would be needed for each turbine foundation. Based on a maximum of 75 turbines installed and the additional needs for construction of the

substation, switchyard, and O&M building, 40,500 tons of concrete would be used. Both gravel pits would be reclaimed following use based on the project restoration plan (see Appendix A).

2.1.1.2.11 Concrete Batch Plant

A 5-acre site within the laydown area would be allocated to install a batch plant for preparing and mixing the concrete used for the WTG foundations, transformer, and equipment foundations at the substation and switchyard, O&M building foundation and floor slab, and other project facilities (see Figure 2.1-1). Prior to installation of the batch plant facilities, a portion of the area would be covered with gravel. The batch plant complex would consist of a mixing plant, areas for sand and gravel stockpiles, and truck load-out and turnaround areas. The batch plant itself would consist of cement storage silos, water and mixture tanks, gravel hoppers, and conveyors to deliver different materials. During construction, materials would be taken from stockpiles and dumped into hoppers with front-end loaders, where they would be mixed together in the mixing plant and then loaded into ready-mix trucks in the truck loading area. The concrete would be delivered to each turbine site, the substation and switchyard, the O&M building, and other locations as needed using ready-mix trucks. Concrete ready-mix trucks would be washed out at designated locations that have been designed for that purpose. At those locations, all effluent would be contained, and refuse concrete would be reclaimed. Following completion of construction, all components of the batch plant would be demobilized, and the site would be reclaimed.

2.1.1.2.12 Water Usage, Amounts, and Source

Because no new water rights in Spring Valley are available, SVW would not drill a new well as part of the proposed project. All necessary water would be obtained through a temporary lease with an existing water rights holder in Spring Valley north of the project area, trucked to the site, and put to immediate use or held in tanks within the laydown area. A final agreement has been reached between SVW and the Church of Jesus Christ of Latter-Day Saints, an existing water rights holder in Spring Valley, for a temporary change in the manner and place of use of a portion of its irrigation water rights. The water used by the SVWEF would displace a similar volume of agricultural use during the construction period and accordingly, there would be no net increase in water diversion. The peak usage is estimated to be approximately 200,000 gallons per day. An elevated 30,000-gallon storage tank would be used at the water source. All water would be delivered by truck from the existing source, approximately 10 miles north of the project area, to the batch plant and project area. Up to 2,000 vehicle trips would be required for water delivery.

The largest needs for water are batching concrete for turbine foundations and dust suppression. Water would also be used for washing equipment, road maintenance/dust control, and potable water. The quantity of water needed by SVW during the construction period would vary from approximately 5 million gallons (15.3 acre-feet) under normal conditions to approximately 10 million gallons (30.7 acre-feet) under conditions of excessive drought and dry land. In order to achieve proper compaction of backfill at foundations, collection trenches, and road base material, water must be added. The amount of water necessary to reach an optimal value for compaction is variable and would depend on moisture conditions at the time of construction. The large range of water use is necessary to account for the potential conditions.

In normal conditions, a total of about 20,000 gallons of water per turbine would be needed for batching concrete; however, Pattern Energy may need to increase the moisture content by as much as 10%. Based on the maximum of 75 turbines, a total of 1,650,000 gallons of water would be needed for turbines. Of the remaining 8,350,000 gallons, ~60%–70% would be used for dust suppression, and the balance (~5,280 gallons a week) would be necessary for potable uses throughout both the construction period and during operations.

2.1.1.2.13 Construction Workforce Numbers, Needs, and Vehicles

On average, up to 175 workers would be employed during a 9- to 12-month construction period. At the peak of construction activity, as many as 225 workers would be employed. There are several trailer parks nearby (Majors Junction is the closest) that could provide temporary living facilities for construction personnel; there is also housing in Ely and Baker, Nevada. During construction, potable water and sanitary facilities at the site would be necessary to support the construction crews. Potable water during construction would consist of bottled water (5-gallon reusable containers); there would be a small non-potable water storage tank for restroom facilities. A temporary septic holding tank would be installed to support the restroom use at the laydown area.

Temporary facilities would be available at the laydown area, and permanent facilities would be available at the O&M building. All construction employees would be encouraged to carpool to the project area, and no more than 150 employee vehicles are anticipated to be on-site at any one time.

2.1.1.2.14 Construction Materials and Components Transportation

Trucks transporting turbines, towers, and other construction materials would travel along U.S. Route 50 and 93, accessing the project area directly from SR 893. Most of the materials and components would be delivered from the south along U.S. Route 93. The location of entry points to the project area for component delivery, construction workers, and operations would be completed through coordination with the Nevada Department of Transportation (NDOT) and White Pine County to ensure that there are no adverse impacts to local traffic patterns. During the construction phase, component and equipment deliveries would be directed to a single, controlled point of entry at the project main gate located off SR 893, at the laydown site. The second access road off of SR 893 would not be used for component and supply deliveries but for general construction traffic control.

Construction traffic would be restricted to the roads developed for the project. Use of existing unimproved roads would be for emergency situations only. Flaggers with two-way radios would be used, if deemed necessary by SVW, to control construction traffic and reduce the potential for accidents along project roads. Speed limits would be set commensurate with road type, traffic volume, vehicle type, and site-specific conditions as necessary to ensure safe and efficient traffic flow. A complete traffic management plan detailing on-site traffic management requirements and route transportation planning guidelines for the project is provided in Appendix B.

Construction of roads, facilities, and electrical/communication lines would occur at about the same time, using individual vehicles for multiple tasks. During the construction period, there would be approximately 150 daily round trips by vehicles transporting construction personnel to the site each day. There would also be approximately 6,402 trips of large trucks delivering the turbine components and related equipment to the project site spread over a 9- to 12-month period (Table 2.1-5).

2.1.1.2.15 Aviation and Project Area Lighting (Wind Turbines)

Turbines would be lit as required by the Federal Aviation Administration (FAA) and described in the project lighting plan (Appendix C). Based on FAA Obstruction Marking and Lighting Advisory Circular 70/7460-1K, no structural markings or alternative colors are proposed for the WTGs. For nighttime visibility, two flashing red beacons would be mounted on the nacelle. Lights would not be placed on all turbines; only those turbines along the periphery of the project area, and no more than 0.5 mile apart within each array, would have lights to mark the extent of the facility.

Table 2.1-5. Estimated Vehicle Trips outside the Project Area for Construction of the Proposed Action

Turbine Component Types	No. of Components Required per Turbine	No. of Components per Truckload	No. of Truckloads per Turbine
Tower sections	3.0	1.0	3.0
Blades	3.0	2.0	1.5
Nacelle	1.0	1.0	1.0
Rotor hub	1.0	2.0	0.5
Foundation components	3.0	1.0	3.0
Total Truck Loads/Turbine			**9.0**
Purpose of Truckload			**Number of Truckloads**
Deliver turbine components (75 turbines)			675
Deliver construction materials			4,000
Crane delivery and removal			450
Deliver electrical components			200
Deliver O&M building materials			50
Deliver pad-mount transformers			25
Deliver step-up transformer			2
Deliver collection system and transmission line materials			1,000
Total Large Truckloads			**6,402**

2.1.1.2.16 Site Stabilization, Protection, and Reclamation Practices

All restoration for the project would follow the guidance in the Restoration and Weed Management Plan (see Appendix A) and would occur after all construction activities are completed. Upon completion of the construction aspect of the project, stockpiled topsoil would be spread across the temporary disturbance areas. To re-establish healthy vegetation communities, a BLM-approved seed mix would be used. Reseeding would take place in accordance with specifications provided by BLM, and access to ROWs would be limited to the public, using gates and signs where necessary to allow for the germination and establishment of replanted sites.

2.1.1.2.17 Waste and Hazardous Materials Management

All construction-related waste would be transported to and stored within the temporary use area until collected for transport to a final landfill destination by a licensed hauler. Materials that can be recycled would be stored and transported separately. SVW would coordinate with the Ely landfill prior to the start of construction. Hazardous materials are typically limited for a project of this nature. However, the following materials are anticipated to be used or produced during construction and operation of the Proposed Action:

- Fuel (diesel and unleaded) for construction equipment and vehicles;
- Lubricants and mineral oils;
- Cleaners; and
- Industrial material.

SVW would obtain all necessary permits required for the transport, use, and storage of hazardous substances. In addition, these substances would be transported, stored, and, when necessary, disposed of in accordance with local, state, and federal laws and regulations.

Fuel, grease, and oil for equipment and vehicles would be stored at the temporary laydown area. If any spillage occurs, the area would be cleaned up in accordance with the requirement of the hazardous materials plan and applicable permit requirements. Fuel, oil, and other fluids used in construction equipment would be transferred directly from a service truck to construction equipment in the project area in accordance with the Spill Prevention Plan (SPP) (Appendix D). Use of turbine lube oil would be handled in accordance with any necessary permit requirements or hazardous materials plan. Any concrete left over would be buried (if approved by BLM) or hauled and disposed of at a permitted site. If buried, the BLM would consider ROWs and pending ROWs to ensure there is no interference with those actions prior to approval. Sanitary waste would be handled by a licensed sanitary waste vendor. For post-construction operations, a septic system would be installed for the O&M building.

2.1.2 Wind Energy Facility Operation

2.1.2.1 OPERATIONS, WORKFORCE, EQUIPMENT, AND FACILITY MAINTENANCE NEEDS

Once the project has been constructed, the SVWEF would be monitored and operated year-round by SVW and would have a permanent staff of 10 to 12 full-time technicians.

The computer control system for each turbine would perform self-diagnostic tests, allowing a remote operator to ensure that each turbine is functioning at peak performance. Routine maintenance activities, consisting of visual inspections, oil changes, and gearbox lubrication, would result in regular truck traffic on project access roads throughout the year. Project access roads would be graded as necessary to facilitate operations and maintenance. A minimum of one maintenance drive around to all turbines would be conducted each day, weather permitting. The substation would undergo weekly, monthly, and annual inspections. Scheduled maintenance of the substation would be on a scheduled program, depending on the type and number of components in the substation, interconnection and North American Electric Reliability Corporation requirements, and environmental conditions at the site. The transmission line interconnecting the substation and switchyard would be visually inspected monthly with more in-depth maintenance on an annual basis. The underground collection system would be visually inspected monthly and would also have scheduled maintenance tasks, again depending on the number and type of components.

The project roads would be used by site personnel to perform their inspection and maintenance activities as well as for purposes such as continued site restoration, basic and major turbine component repairs (may require crane access), electrical checks, environmental inspections, snow removal, and site tours.

There would be oil and hydraulic fluid stored at the site in the storage shed near the O&M building. This storage shed would include a secondary containment for storage of fluids. Such fuel storage would be in accordance with all local, state, and federal regulations and would be in small amounts (<50 gallons).

Lighting requirements during operations would be limited to the 20-acre facility and would be motion activated. There is no exterior lighting on the turbines other than the FAA lights at the top of the towers. If additional lighting is required for night activity, portable lights would be brought in on a temporary basis to allow repairs to be completed.

Annual maintenance activities that require the shutdown of turbines would be coordinated to occur during periods of little or no wind to minimize the impact to the amount of overall energy generation. Annual maintenance procedures would consist of inspecting WTG components and fasteners.

2.1.2.2 MAINTENANCE ACTIVITIES, INCLUDING ROAD MAINTENANCE

All equipment used in the operation of this project would be maintained and inspected regularly by authorized and trained facility staff. A complete schedule would be established before the start of operations.

The access roads built and used during the construction phase would be maintained throughout commercial operations. Cattle guards installed where access roads cross existing fences would also be inspected and maintained throughout commercial operations. During operations, all project access roads would be evaluated and graded as necessary to facilitate operations and maintenance. In addition to grading, the application of new gravel may be necessary to maintain road surfaces. Water would be used as needed for dust control.

2.1.3 Wind Energy Facility Decommissioning

Decommissioning involves the removal and disposal of infrastructure and facilities associated with a wind energy facility. SVW anticipates that the SVWEF would have a usable lifespan, after which continued operation would not be cost-effective. This is expected to occur after approximately 30 years of operation. Once the usable lifespan of the wind energy facility has been reached, the goal is to return the site to as close to preconstruction conditions as possible. Prior to decommissioning, a detailed plan would be prepared to address specific needs of the project consistent with the BLM policy and would be approved by the BLM. The BMPs and stipulations that have been developed for construction activities would be applied to similar activities completed during decommissioning.

Generally, decommissioning involves disassembling WTGs and associated infrastructure and salvaging any valuable materials such as steel and copper. Unsalvageable materials would be disposed of at an approved landfill location. Following removal of facilities, turbine foundations would be partially removed to below grade, and pads and access roads would be recontoured and reseeded. Ground disturbance and impacts associated with decommissioning would be similar to those associated with construction activities.

2.1.4 Construction, Operation, and Reclamation Design Features

2.1.4.1 FACILITY COMMITMENTS

- Existing roads and utility corridors – The primary north-south road follows an existing dirt road, and the project would tie into the existing 230-kV line.
- Tubular conical steel turbine towers – Tubular towers do not provide locations for raptors to perch, which decreases the risk of collisions with turbine blades.
- Underground collection system – Reduces the visual impact of overhead transmission as well as the potential impact to avian and bat species from collisions.
- Setbacks – Turbines would be set back from public roads at least 1.1× total turbine height and would be set back 1.5× total turbine height from any property lines and ROW boundary.

2.1.4.2 CONSTRUCTION, OPERATION, AND DECOMMISSIONING COMMITMENTS

- Construction vehicle movement within the project boundary would be restricted to pre-designated access, contractor-required access, and public roads.
- A qualified third-party contractor would serve as an Environmental Inspector to ensure compliance with all project authorizations, permits, and approvals.
- In construction areas where ground disturbance is unavoidable, surface restoration would consist of recontouring and reseeding with a BLM-approved seed mix. A full list of BMPs would be included in the project's Construction, Operation, and Maintenance (COM) Plan.
- Geotechnical investigations would be done for each turbine to ensure not to puncture and dewater the aquifer. Specific measures would be developed as needed to address geotechnical issues.
- If the perching groundwater layer, as identified by the on-site geologist or geotechnical engineer or engineer's representative is breached, the hole or breach point would be seal grouted to preserve the subsurface hydrology that feeds the local system.
- For all excavations, the crews would be instructed to minimize the period of time that a trench or hole is open; however, in some cases excavations would be left open overnight or for several days in the case of turbine foundations. For all excavations left overnight, measures would be put in place to prevent injury to wildlife. Those measures include either covering holes or installing temporary visible barriers around trenches/holes. All turbine foundations would also have ramps that would allow animals to climb out.
- The Traffic Management Plan (see Appendix B) would be followed for the site access roads to ensure that no hazards would result from the increased truck traffic and that traffic flow would not be adversely impacted. This plan shall incorporate measures such as informational signs, flaggers when equipment may result in blocked throughways, and traffic cones to identify any necessary changes in temporary lane configuration. Additionally, SVW would consult with local planning authorities regarding increased traffic during the construction phase, including an assessment of the number of vehicles per day and their size and type.
- A detailed transportation plan/route study would be completed following the transportation planning requirements described in Appendix B.
- The Lighting Plan (see Appendix C) would be followed to ensure that lighting is installed to meet safety and FAA requirements as well as to reduce night sky lighting and wildlife effects.

2.1.4.3 RESOURCE CONSERVATION MEASURES

- Measures from the PEIS would be followed as shown in Table 6.2-1.
- Cultural Resources Monitoring and Discovery Plan (Appendix E) – The plan describes procedures to follow in accordance with state and federal laws, if archaeological materials or human remains are discovered. Adherence to this plan would protect cultural resources that are discovered, assist construction personnel in complying with applicable laws, and expedite the project in the event of discovery.
- Direct avoidance of any eligible cultural resources.
- A worker education awareness program providing instruction on avoiding harassment and disturbance of wildlife, especially during reproductive (e.g., courtship, nesting) seasons, would be provided to all construction employees prior to ground breaking activities.
- Avian and Bat Protection Plan (ABPP) (Appendix F) – The plan describes initial mitigation requirements, post-construction monitoring requirements, and an adaptive mitigation strategy.

The plan uses a tiered approach that would result in different levels of mitigation being implemented based on the findings of post-construction monitoring.

- Facilities shall be designed to discourage their use as perching or nesting substrates by birds. For example, power lines and poles shall be configured to minimize raptor electrocutions and discourage raptor and raven nesting and perching. The BLM and the project proponent would consult with NDOW on the final deterrent design.
- Migratory birds – If construction is planned between March 15 and July 30, migratory bird clearance surveys would be conducted no more than one week before construction. Evidence of active nests or nesting would be reported immediately to the BLM to determine appropriate minimization measures (i.e., avoidance buffer would be established until birds have fledged the nest) on a case-by-case basis.
- Nest surveys would be conducted prior to the nesting season (approximately March 15 to July 30) and once each month during the nesting season during the first three years and every fifth year after that. Aerial or ground-based raptor nest surveys would be conducted within the entire project area and a 1-mile buffer for raptors (BLM 2007), except for golden eagles (*Aquila chrysaetos*). Golden eagle search distances would be 10 miles from the project area based on current U.S. Fish and Wildlife Service (USFWS) guidance. The complete 10-mile search area would be limited to once at the beginning of the golden eagle nesting season with monthly follow-up surveys only being completed for identified golden eagle or potential golden eagle nests. Where appropriate, activities would be restricted from May 1 through July 15 within 0.5 mile of any raptor nest site that has been active within the past five years. See Appendix F, Section 4.5 for further details on this measure. If a bird nest is found to be in use, the Technical Advisory Committee (TAC) would recommend necessary action based on the ABPP (see Appendix F).
- All new aboveground poles and transmission lines installed would be constructed to Avian Power Line Interaction Committee (2006) standards to reduce the likelihood of collision and electrocution.
- Where appropriate, permitted activities would be restricted from March 1 through May 15 within 2 miles of an active greater sage-grouse lek.
- As part of SVW's environmental commitment, the company would donate $500,000 to enhance sagebrush habitat that supports sagebrush-obligate species such as the greater sage-grouse and pygmy rabbit. Funds would be deposited into NDOW's Non-Executive Account and marked specifically for purposes of sagebrush restoration efforts at the onset of construction activities. Through a Memorandum of Agreement, NDOW and BLM would develop a cooperative conservation agreement plan for utilization purposes, which could include permitting, equipment and seed purchase, labor, and other necessities for restoration. An effort must first be made to apply the funds to sagebrush restoration within Spring Valley and then outside the valley if necessary. Donations into this account are eligible for matching federal funding. All decisions of how to utilize the money would require both NDOW and the BLM approval.
- Where appropriate, permitted construction activities would be restricted from November 1 through March 31 within greater sage-grouse winter range. If activities must occur during that time, a survey would occur prior to work to determine whether greater sage-grouse are present. Pedestrian transect surveys spaced 300 feet apart would be conducted within the proposed areas of disturbance and a 0.25 mile buffer. If individuals are not present, work may commence; if individuals are present, the BLM would determine necessary action such as requiring an on-site biological monitor or restricting work areas until sage-grouse have left the project area.
- A site-specific Stormwater Pollution Prevention Plan (SWPPP) would be prepared following the requirements outlined in the project SWPPP and SPP (see Appendix D).

- A Restoration and Weed Management Plan has been completed for the project (see Appendix A) and would be followed.
- Micrositing of staging and temporary use areas would be completed as practicable to avoid winterfat-dominated sites.
- For soil-disturbing actions that would require reclamation, all available growth medium would be salvaged and stockpiled prior to surface disturbances. Stock piles would be seeded if they are to be left for more than one growing season. All disturbance areas would be recontoured to blend as closely as possible with the natural topography prior to revegetation. SVW would rip all compacted portions of the disturbance to an appropriate depth based on recognizable soil compaction indicators, i.e., platy soil structure. An adequate seed bed would be established to provide good seed to soil contact.
- Any swamp cedar (*Juniperus scopulorum*) that must be removed would be made available for education, scientific, and research purposes as determined by the BLM.
- Measures for reducing the spread and establishment of noxious and invasive weeds have been incorporated into the Restoration and Weed Management Plan (see Appendix A). The plan addresses monitoring, education of personnel on weed identification, the manner in which weeds spread, and methods for treating infestations. The use of certified weed-free mulching is required. Trucks and construction equipment (including mobile office trailers, etc.) arriving from other locations would have a controlled inspection and a cleaning area would be established to visually inspect equipment arriving at the project area and to remove and contain seeds that may be adhering to tires and other equipment surfaces.
- If pesticides are used on-site, an integrated pest management plan shall be developed to ensure that applications would be conducted within the framework of BLM and U.S. Department of the Interior policies and entail only the use of U.S. Environmental Protection Agency (EPA)-registered pesticides. Pesticide use shall be limited to non-persistent, immobile pesticides and shall only be applied in accordance with label and application permit directions and stipulations for terrestrial and aquatic applications.
- Weed management in areas of special-status species would carefully consider the impacts of the treatment on the organism. Whenever possible, manual control or spot treatment using herbicides is preferred over less species specific methods. Noxious and invasive weed control would not be conducted within 0.5 mile of nesting and brood rearing areas for special-status species during the nesting and brood rearing season.
- All straw, hay, straw/hay, or other organic products used for reclamation or stabilization activities must be certified that all materials are free of plant species listed on the Nevada noxious weed list or specifically identified by the BLM Ely District Office. Inspections would be conducted by a weed scientist or qualified biologist.
- Where appropriate, vehicles and heavy equipment used for the completion, maintenance, inspection, or monitoring of ground-disturbing activities; for emergency fire suppression; or for authorized off-road driving would be free of soil and debris capable of transporting weed propagules. Vehicles and equipment would be cleaned with power or high-pressure equipment prior to entering or leaving the work site or project area. Vehicles used for emergency fire suppression would be cleaned as a part of check-in and demobilization procedures. Cleaning efforts would concentrate on tracks, feet, or tires and on the undercarriage. Special emphasis would be applied to axles, frames, cross members, motor mounts, on and underneath steps, running boards, and front bumper/brush guard assemblies. Vehicle cabs would be swept out, and refuse would be disposed of in waste receptacles. Cleaning sites would be recorded using global positioning systems (GPS) units or other mutually acceptable equipment and provided to the Ely District Office Weed Coordinator or designated contact person.

- Prior to the entry of vehicles and equipment to a planned disturbance area, a weed scientist or qualified biologist would identify and flag areas containing weeds. The flagging would alert personnel or participants to avoid areas of concern whenever possible.
- To minimize the transport of soil-borne noxious weed seeds, roots, or rhizomes, infested soils or materials would not be moved and redistributed on weed-free or relatively weed-free areas. In areas where infestations are identified or noted and infested soils, rock, or overburden must be moved, these materials would be salvaged and stockpiled adjacent to the area from which they were stripped. Appropriate measures would be taken to minimize wind and water erosion of these stockpiles. During reclamation, the materials would be returned to the area from which they were stripped.
- A 3.6-mile-long fence would be constructed outside the northeast corner of the project area to keep cattle in the Bastian Creek Allotment from entering the project area during construction and rehabilitation. The new fence would tie with existing fences associated with management of the grazing allotment. SNWA owns 80 acres with a water source for grazing animals at the northeast corner of the project area. A fence surrounding the SNWA 80-acre parcel would also be constructed with gates allowing access from inside and outside the project area.
- A 5.6-mile-long fence would be constructed on the west side of the project area to connect with existing fences in order to keep cattle in the Majors Allotment from entering the project area during construction and rehabilitation. Cattle guards would be added at the two road crossings along the fence line. The fence specifications would be the same as those for the Bastian Creek fence described above.
- Subject to FAA approval, an intelligent on-demand lighting system would be installed on WTGs.

2.2 Alternate Development Alternative (BLM Preferred Alternative)

The Alternate Development Alternative was developed to address potential conflicts with sensitive biological, cultural, and Native American conflicts. This alternative would also use 75 turbines to provide 149.1 MW of power, but turbine locations have been altered and would occur within a smaller overall project area (7,673 acres). General construction, operation, and maintenance of this alternative would be the same as for the Proposed Action.

2.2.1 Wind Energy Facility Construction

Construction of this alternative would be completed in the same way and follow the same construction schedule as the Proposed Action. The actual long-term ground disturbance of the turbines and plant infrastructure (civil and electrical) would be approximately 1.4% of the total project area.

2.2.1.1 WIND ENERGY FACILITY COMPONENTS

The components for this alternative would be the same as the Proposed Action. The short-term (the period from beginning of construction until reclamation) and long-term disturbance (the duration of the project) areas for this alternative are described in Tables 2.2-1 and 2.2-2. The alternative project area totals approximately 7,673 acres, all of which are on BLM land covered by the requested ROW. The total area estimated for use by the wind energy facility (including both short- and long-term disturbance) is approximately 430.1 acres, or approximately 5.6% of the total ROW.

Table 2.2-1. SVWEF Components: Maximum Short-Term Disturbance Summary Table, Based on Construction of the Alternate Development Alternative

Facility Component	Disturbance Length (feet)	Disturbance Width (feet)	Short-Term Disturbance (acres)	% Project Area
Turbine foundations and crane pads (×75)	400[1]	N/A	217.5	0.028
Laydown, batching plant, and parking area	820	530	10.0	0.001
Access roads	129,542	40	118.96	0.016
Collection system	138,579	20	63.63	0.008
Fiber-optic line[2]	390	20	0.18	NA
Radar fiber-optic line	500	20	0.23	0.000
Gravel Pits A & B and access[‡]	660	660	10.0	0.001
Footprint overlap[≠]	N/A	N/A	−95.1	−0.012
Total			**325.4**	0.042

[1] This measurement represents the diameter of the disturbance area.

[2] Outside project area but contributes to overall disturbance footprint.

[3] 10.0-acre Gravel Pit B is an off-site existing disturbance and is not included in the overall disturbance acreage.

[≠] Overlap is the intersection of two different component disturbance areas and is therefore removed from the total disturbance. For example, a temporary turbine work area may partially overlap the collection system. In that case, the overlapping turbine acreage has been subtracted in order to not double-count disturbance.

Table 2.2-2. SVWEF Components: Maximum Long-Term Disturbance Summary Table, Based on Construction of the Alternate Development Alternative

Facility Component	Disturbance Length (feet)	Disturbance Width (feet)	Long-Term Disturbance (acres)	% Project Area
Turbine foundations and crane pads (×75)	75[1]	N/A	22.5	0.003
Access roads (add 2 radar access roads – 0.23 acre each)	129,542	28	83.27	0.011
MET tower	50[1]	N/A	0.1	0.000
Spring Valley substation, Osceola substation, and O&M building (includes two microwave towers)	1,080	805	20.0	0.003
Radars	25	35	0.02	0.000
Fence[2]	34,470	12	9.5	NA
Footprint overlap[≠]	N/A	N/A	−30.72	−0.004
Total			**104.67**	0.013

[1] This measurement represents the diameter of the disturbance area.

[≠] Overlap is the intersection of two different component disturbance areas and is therefore removed from the total disturbance. For example, a temporary turbine work area may partially overlap the collection system. In that case, the overlapping turbine acreage has been subtracted in order to not double-count disturbance.

[2] Outside project area but contributes to overall disturbance footprint.

2.2.1.2 PRECONSTRUCTION AND CONSTRUCTION ACTIVITIES

An overview of construction activities necessary for the development of a wind energy project is described in BLM's PEIS (BLM 2005). The following preconstruction and construction activities are specifically relevant to the SVWEF Alternate Development Alternative.

2.2.1.2.1 Geotechnical Investigations

Geotechnical investigations are the same as for the Proposed Action.

2.2.1.2.2 Site Preparation

Site preparation is the same as for the Proposed Action.

2.2.1.2.3 Wind Turbine Layout, Installation, and Construction Processes

The same potential turbine types have been identified for the Alternate Development Alternative as the Proposed Action, and the same installation and construction processes would be followed. However, for this alternative the 75 turbines have been sited to avoid major resource issues while still maintaining locations that provide sufficient wind speed and consistency for a viable project. Figure 2.2-1 presents the site layout for the Alternate Development Alternative. Resource avoidance includes:

- At least 0.5 mile from recorded active raptor nests (SWCA Environmental Consultants [SWCA] 2009a);
- At least 0.5 mile from open water sources (SWCA 2009b);
- Outside occupied and high-quality pygmy rabbit habitat (SWCA 2009b);
- At least 2 miles from active sage-grouse leks (SWCA 2009b); and
- Outside Native American sacred areas (SWCA 2009c).

2.2.1.2.4 Wind Turbine Components and Assembly

Wind turbine components and assembly are the same as under the Proposed Action.

2.2.1.2.5 Temporary Construction Workspace, Yards, Materials Storage, and Staging Areas

Temporary construction workspace, yards, materials storage, and staging areas would be the same as under the Proposed Action.

2.2.1.2.6 Access Roads

Access roads would be built to the same widths and road standards as under the Proposed Action. Under the Alternate Development Alternative, a new, long-term, approximately 0.5-mile-long site access road to the first WTG in that WTG array would be constructed approximately 0.3 mile from the existing transmission line access road; a second permanent access road, approximately 0.6 mile long, to the first WTG in that WTG array would be constructed approximately 0.7 mile north of the primary access road. The Alternate Development Alternative would use the existing north-south road to access turbine strings. There would be up to a total of 25.8 miles of new access roads, including the two site access roads, the turbine access roads, and the MERLIN radar unit access roads. Access roads for gravel pits (1.1 miles) would be along existing roads that would be improved, with a maximum expansion to 28 feet wide. Portions of the roads exclusively for gravel pit access would be reclaimed entirely. Remaining sections of road that would be used for other purposes such as administrative access would be restored back to their original condition. There would be up to 83.3 acres of disturbance from new road construction that would not be restored until after decommissioning. The final long-term roads would be compacted and surfaced with gravel aggregate from BLM-permitted sources.

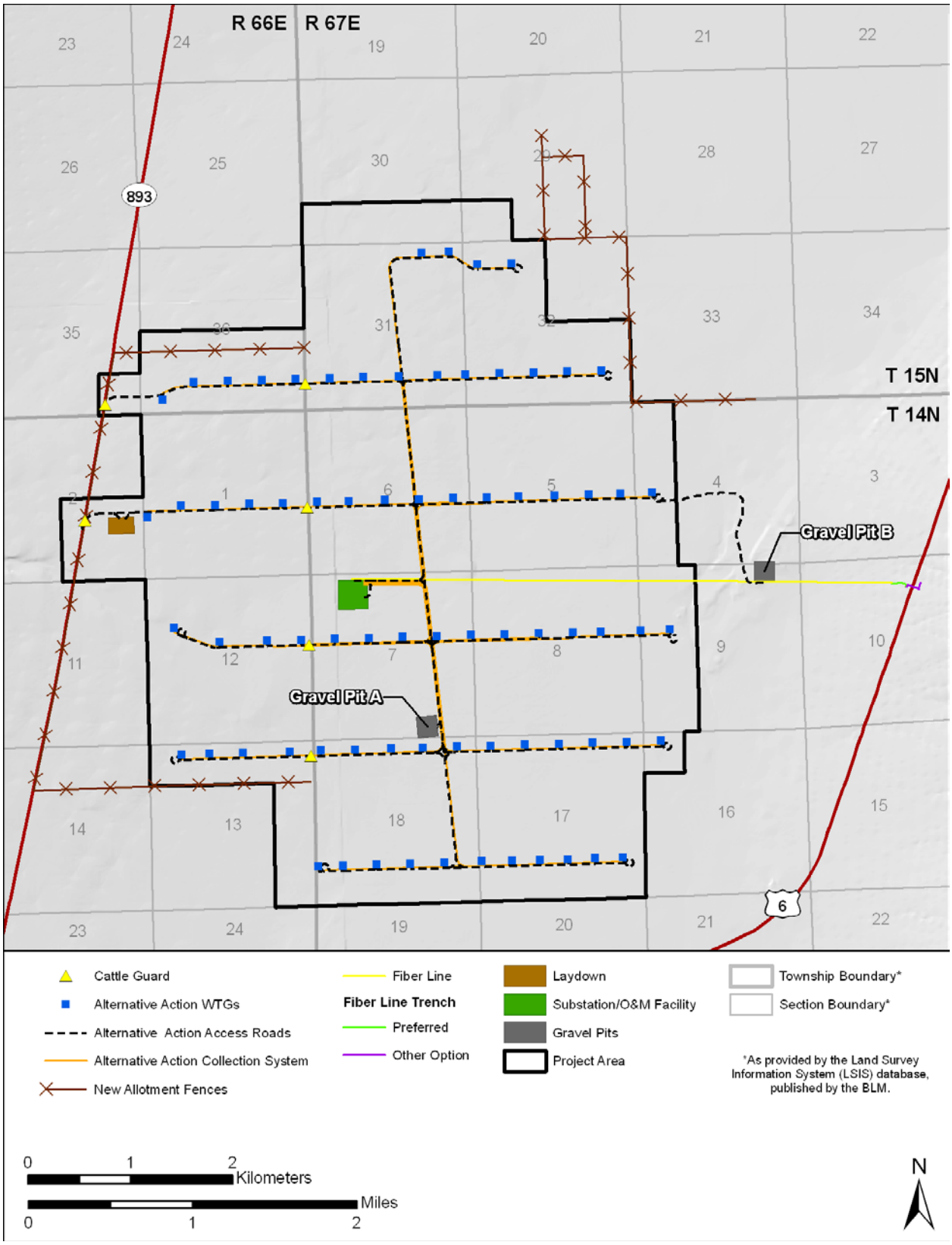

Figure 2.2-1. Alternate Development Alternative site layout.

2.2.1.2.7 Electrical System

The electrical system would include the same components and design as under the Proposed Action, including the Spring Valley substation and Osceola switchyard. However, under the Alternate Development Alternative, approximately 26.2 miles of trenches for collector cables would be required, with a total of 63.6 acres of temporary disturbance.

2.2.1.2.8 Communications System Requirements (Microwave, Fiber Optics, Hard Wire, Wireless)

Communication system requirements, including the microwave tower, would be the same as under the Proposed Action. Under this alternative, approximately 26.3 miles of fiber-optic cables and collector cables would be placed underground in trenches adjacent to access roads. The fiber-optic cable from the Osceola switching station would not change from what is described under the Proposed Action.

Both the MERLIN and VESPER radar systems would be installed and operated as described under the Proposed Action.

2.2.1.2.9 O&M Building

Components and construction of the O&M building would be the same as under the Proposed Action.

2.2.1.2.10 Gravel, Aggregate, and Concrete Needs and Sources

Gravel, aggregate, and concrete needs and sources would be the same as under the Proposed Action.

2.2.1.2.11 Concrete Batch Plant

The concrete batch plant would be the same as under the Proposed Action.

2.2.1.2.12 Water Usage, Amounts, and Source

Water usage, amounts, and source would be the same as under the Proposed Action.

2.2.1.2.13 Construction Workforce Numbers, Needs, and Vehicles

Construction workforce numbers, needs, and vehicles would be the same as under the Proposed Action.

2.2.1.2.14 Construction Materials and Components Transportation

Construction materials and components transportation would be the same as under the Proposed Action.

2.2.1.2.15 Aviation and Project Area Lighting (Wind Turbines)

Aviation and project area lighting would be the same as under the Proposed Action.

2.2.1.2.16 Site Stabilization, Protection, and Reclamation Practices

Site stabilization, protection, and reclamation practices would be the same as under the Proposed Action.

2.2.1.2.17 Waste and Hazardous Materials Management

Waste and hazardous materials management would be the same as under the Proposed Action.

2.2.2 Wind Energy Facility Operation

2.2.2.1 OPERATIONS, WORKFORCE, EQUIPMENT, AND FACILITY MAINTENANCE NEEDS

Operations, workforce, equipment, and facility maintenance needs would be the same as under the Proposed Action.

2.2.2.2 MAINTENANCE ACTIVITIES, INCLUDING ROAD MAINTENANCE

Maintenance activities, including road maintenance, would be the same as under the Proposed Action.

2.2.3 Wind Energy Facility Decommissioning

Decommissioning would be the same as under the Proposed Action.

2.2.4 Design Features Included in the Alternate Development Alternative

All measures identified for the Proposed Action would also be applied to the Alternate Development Alternative.

2.3 No-Action Alternative

Under the No-Action Alternative, SVW's ROW application to develop the SVWEF under the Proposed Action or Alternate Development Alternative would not be approved. The SVWEF would not be developed, and existing land uses within the project area would continue. The No-Action Alternative forms the baseline against which the potential impacts of the Proposed Action and Alternate Development Alternative are compared. Thus, it includes current actions and activities within the SVWEF project area. No additional actions are assumed to occur in the absence of approval of any of the action alternatives.

Selection of the No-Action Alternative would not preclude the approval of other ROWs for energy development or other projects sometime in the future. However, to compare the human and environmental impacts of developing the SVWEF versus not developing it, this EA was prepared under the assumption that other ROWs would not be issued in the project area in the near future if the No-Action Alternative were selected. Reasonably foreseeable future actions are considered in the cumulative impacts section of this EA. Authorization of future projects would require another ROW application and completion of another NEPA process.

DOE's No-Action Alternative would be to not grant a federal loan guarantee. If a DOE loan guarantee were not granted, construction of the project would be contingent upon BLM issuing the necessary ROW grants and the ability of SVW to obtain commercial financing without a federal guarantee. If SVW were able to obtain the ROW grants and financing, the environmental impacts described for the action alternatives would still occur, otherwise the project would not go forward and the impacts would not occur.

2.4 Comparison of Alternatives

Resource	Proposed Action	Alternate Development Alternative	No-Action Alternative
Reptiles and Amphibians	Habitat loss, injury, and mortality would occur during construction. Increased run-off, dust, and erosion would result in decreased surface water quality. Wetland areas in the project area would be avoided, reducing the risk of changes in water quality and habitat for amphibians.	Impacts would be similar to those described under the Proposed Action. Impacts to surface water quality from run-off, and erosion would be reduced by excluding WTG sites within 0.5 mile of open water sources.	No change from current conditions.
Small Mammals	Disturbance from construction and operation of the SVWEF would result in habitat loss, increased invasive vegetation, mortality, decreased water quality, and increased predation.	Impacts would be similar to those described under the Proposed Action. Impacts to water quality and drinking water availability from run-off and erosion would be reduced by WTG sites being placed outside high-quality and occupied pygmy rabbit habitat.	No change from current conditions.
Big-game Species	There would be no loss of crucial winter habitat for pronghorn. Displacement of elk, mule deer, and pronghorn from the entire project area would occur during construction as a result of increased human presence and noise levels.	The effects would be similar to those described under the Proposed Action.	No change from current conditions.
Waterfowl and Shorebirds	An increased risk of injury and mortality would occur from construction activities, collisions, and the risk of electrocution. Noise levels during construction and permanent disruption of vegetation would deter some species from using the project area.	Impacts would be similar to those described under the Proposed Action, but the intensity would be reduced. Collisions with WTGs are expected to be lower as a result of excluding WTG sites within 0.5 mile of open water sources.	No change from current conditions.
Songbirds	Loss of habitat, injury, and increased risk of mortality would occur during construction. Mortality from electrocution, and collisions with WTGs and other vertical structures would occur during operations.	Impacts would be similar to the Proposed Action, but the intensity would be reduced. Collisions with WTGs are expected to be lower as a result of excluding WTG sites within 0.5 mile of open water sources.	No change from current conditions.
Birds of Prey and Vultures	As a result of construction and operational activities, loss of habitat, increased mortality and injury, and interference with behavioral activity (nesting) would occur.	Impacts to these species would be similar to those described under the Proposed Action. Fatalities from collisions and nest abandonment would be reduced because construction activities would not occur within 0.5 mile of known raptor nests.	No change from current conditions.
Bats	Loss of habitat, injury, and mortality would occur during construction. Mortality from electrocution, barotraumas, and collisions with WTGs and other vertical structures would occur during operations.	Impacts to these species would be similar to those described under the Proposed Action. Barotraumas and collisions with WTGs are expected to be lower as a result of excluding WTG sites within 0.5 mile of open water sources.	No change from current conditions.
Special-status Small Mammals	Disturbance from construction and operation of the SVWEF would result in habitat loss, increased invasive vegetation, mortality, decreased water quality, and increased predation on pygmy rabbits. Habitat enhancement for sagebrush restoration as part of the Proposed Action would provide new and/or improved sagebrush habitat for the species over the long-term.	Impacts would be similar to those described under the Proposed Action. Impacts to water quality and drinking water availability from run-off, and erosion would be reduced by WTG sites being placed outside high-quality and occupied pygmy rabbit habitat. Habitat enhancement for sagebrush restoration as part of the Alternate Development Alternative action would provide new and/or improved sagebrush habitat for the species over the long-term.	No change from current conditions.

Resource	Proposed Action	Alternate Development Alternative	No-Action Alternative
Special-status Waterfowl and Shorebirds	Infrequent collisions with turbines may occur. Impacts would be similar to the effects on waterfowl and shorebirds section.	Impacts would be similar to the Proposed Action, but the intensity would be reduced. Collisions with WTGs are expected to be lower as a result of excluding WTG sites within 0.5 mile of open water sources where waterfowl and shorebirds occur more frequently.	No change from current conditions.
Special-status Songbirds	Loss of habitat, injury, and mortality would occur during construction. Mortality from electrocution and collisions with WTGs and other vertical structures would occur during operations. Because of their frequent representation during surveys and observation in the rotor-swept area, injury or mortality to loggerhead shrikes is expected to be more frequent than for other species.	Impacts would be similar to the Proposed Action, but the intensity would be reduced. Collisions with WTGs are expected to be lower as a result of excluding WTG sites within 0.5 mile of open water sources where songbirds occur more frequently.	No change from current conditions.
Special-status Gallinaceous Birds	The presence of WTGs and associated facilities would result in greater sage-grouse avoidance of the project area and up to 2 miles surrounding new vertical structures. Potential abandonment of nesting areas and the Bastian Creek lek may occur. Habitat enhancement for sagebrush restoration as part of the Proposed Action would provide new and/or improved sagebrush habitat for the species over the long-term.	Impacts are expected to be similar to those under the Proposed Action. Active leks would be avoided by at least 2 miles, reducing the risk of lek abandonment. Habitat enhancement for sagebrush restoration as part of the Alternate Development Alternative action would provide new and/or improved sagebrush habitat for the species over the long-term.	No change from current conditions.
Special-status Birds of Prey	As a result of construction and operational activities, loss of habitat, increased mortality and injury, and interference with behavioral activity (nesting) would occur.	Impacts to these species would be similar to those described under the Proposed Action. Fatalities from collisions and nest abandonment would be reduced because construction activities would not occur within 0.5 mile of known raptor nests.	No change from current conditions.
Special-status Bats	Loss of habitat, injury, and mortality would occur during construction. Mortality from electrocution, barotraumas, and collisions with WTGs and other vertical structures would occur during operations. Brazilian free-tailed bats are the most common migratory special-status bat species in the area and are most susceptible to mortality from collisions and barotraumas.	Impacts to these species would be similar to those described under the Proposed Action. Barotraumas and collisions with WTGs are expected to be lower as a result of excluding WTG sites within 0.5 mile of open water sources.	No change from current conditions.
Special-status Vegetation	Direct mortality and decreased plant productivity may result from construction and operational activities. Parish phacelia is the only species identified with the potential to occur in the project area. Based on observations, limited suitable habitat occurs in the project area.	Impacts to Parish phacelia would be similar to those described under the Proposed Action.	No change from current conditions.
Grazing	There would be both a short-term and long-term loss of forage available to livestock grazing from the construction and operation and the SVWEF. Fencing to prevent livestock from impacting restoration success would exclude livestock from portions of both the Bastian Creek and Majors allotments. There would be no loss of animal unit months in either allotment.	Impacts to grazing would be similar to those described under the Proposed Action.	No change from current conditions.

Resource	Proposed Action	Alternate Development Alternative	No-Action Alternative
Surface Water	Surface water quality would be affected by an increase in impermeable surfaces and runoff.	Impacts to surface water flows would occur but would be less than for the Proposed Action. Roads would be placed farther, over 0.5 mile, from open water sources, and there would be a reduced area of new impermeable surfaces.	No change from current conditions.
Groundwater	Groundwater would be used mostly during construction for dust control and during operation for potable uses and maintenance.	Impacts would be the same as those described under the Proposed Action.	No change from current conditions.
Cultural Resources	The Proposed Action has been designed to avoid all identified cultural resources within the project area. There would be an increased risk of damage and loss to cultural resources not identified during the Class III surveys. Additionally, operation of the facility would result in increased public visitation to the area and increased risk of vandalism and destruction.	Impacts to cultural resources would be similar to those described under the Proposed Action. Risk of encountering sites not identified would be reduced as a result of the reduced project area size.	No change from current conditions.
Native American Concerns	Impacts to interests of Native Americans would occur from the increased risk of damage to cultural resources, loss of traditional plant-collecting areas, and visual and aural contrasts to the historic setting of the Swamp Cedar ACEC.	Through tribal consultation, WTG locations under the Alternate Development Alternative have been located to reduce impacts to Native American concerns.	No change from current conditions.
Visual Resources	Temporary disturbances during construction to vegetation and landscape would be visible for years after completion. WTGs would be visible for the life of the project. The WTGs and facilities would result in contrasts with the line, form, and color of the current landscape.	The contrasts to the existing landscape would be the same as those described under the Proposed Action.	The landscape would continue to be influenced by the current disturbances.
Night Sky Conditions	Lighting on the turbines and facilities would be necessary for safety, with minimal impact to the nighttime skyglow. There would be no change to the area's Bortle Dark Sky rating.	The lighting and nighttime effects would be the same as those under the Proposed Action.	No change from current conditions.
Noise	Effects from construction traffic and employee vehicle traffic would result in a short-term increase in ambient noise levels. Long-term noise would result from daily facility activities.	Construction activities would occur further from the Bastian Creek Ranch. The same increases in noise levels would occur as under the Proposed Action but would be farther from the sensitive noise receptor at the ranch.	Current ambient noise levels would remain.
Transportation	An increase in traffic on local highways and routes would occur during construction from construction personnel, component deliveries, and construction equipment. Traffic increases would only occur during the construction phase.	Impacts to transportation would be the same as those described under the Proposed Action.	No change from current conditions.
Land Uses	Temporary, intermittent delays to access nearby ROWs during construction would occur. Operation and maintenance would result in long-term change to the undeveloped character of the land.	Impacts would be similar to those described under the Proposed Action. There would be fewer access roads, avoidance areas, and effects from construction activities under the Alternate Development Alternative.	Land uses would be managed under their current conditions by the BLM.
Special Designations	Construction activities would result in indirect disturbances to ACECs from increased fugitive dust and noise. Installation of bat monitoring equipment would result in long-term disturbance at Rose Guano Cave ACEC.	Similar impacts would result to ACECs as described under the Proposed Action.	No change from current conditions.

Resource	Proposed Action	Alternate Development Alternative	No-Action Alternative
Recreation	Public access would be restricted temporarily, and traffic delays would occur intermittently during construction. A decrease in scenic quality would occur to surrounding recreational areas. There would be a negligible loss in hunting opportunities in Spring Valley.	Similar impacts would be seen to recreational sites and activities as described under the Proposed Action.	No change from current conditions.
Socioeconomics	Short-term beneficial impacts include the creation of jobs during construction. The operations and maintenance would bring increased tax revenue and long-term jobs to White Pine County.	Similar impacts would be seen for construction and operation as those described under the Proposed Action.	No change from current conditions.

2.5 Alternatives Considered but Eliminated from Detailed Analysis

NEPA mandates that reasonable alternatives to the Proposed Action be considered. Reasonable alternatives cannot be "straw men alternatives" or be functionally equivalent to the "no-action" alternative. An example of such an alternative would be to propose a coal-fired power plant when a proponent that builds wind energy facilities has proposed a wind energy facility. If analyzed, the coal-fired plant alternative would either be a "straw man" to satisfy a perceived need for an alternative with no intention of selecting it in the final decision, or, if actually selected, would ultimately have the same impacts as the No-Action Alternative since it could not be reasonably expected to be implemented by the proponent (unless another company came forth and built a coal-fired power plant as analyzed—an extremely unlikely scenario).

2.5.1 Alternate Northern Project Area

An alternate location directly north of and adjacent to the Proposed Action area that included some proposed development on private lands was considered. SVW installed and maintained three MET towers monitoring the wind resource throughout the area for two to three years. Wind data collected by SVW over that time show that the northern project area does not have an economically viable wind resource that would meet the need of the PPA for the proposed project. In addition, BLM resource specialists indicated that there was a greater potential to affect sensitive cultural resources, and the WTGs associated with this area would have been clearly visible from private residences on Sacramento Pass and campsites in the Cleve Creek Recreation Area.

2.5.2 Alternate Northeastern Project Area

A location northeast of the Proposed Action area, including lands within and directly adjacent to the Swamp Cedar ACEC, was considered. Following completion of wildlife surveys and cultural resource intensive inventory of the area, the BLM determined that there was a greater potential to affect sensitive cultural resources and wildlife use associated with the ACEC, and this project area was eliminated from further detailed analysis.

2.6 Conformance with BLM Land Use Plan

The Proposed Action is in conformance with Management Action RE-1 identified in the Ely RMP/FEIS, which directs the BLM to "review proposed renewable energy developments on a project-specific basis, considering potential resource conflicts and mitigation measures. Areas of high potential for wind and solar energy development are identified but no specific areas are designated for such development" (BLM 2008a). Additionally, the Proposed Action is in conformance with the following BLM goals and objectives for renewable energy:

- "provide opportunities for development of renewable energy sources such as wind, solar, biomass, and other alternative energy sources while minimizing adverse impacts to other resources" (BLM 2008a); and
- "be responsive to applications for renewable energy sites and associated rights of way, as encouraged by current BLM policy" (BLM 2008a).

In addition, review of management decisions for other resources and concerns such as Special-status Species, Cultural Resources, and VRM that would possibly be impacted by the project was conducted, and it was determined that approval of the Proposed Action is in conformance with the Ely RMP.

2.7 Relationship to Statutes, Regulations, or Other Plans

The issuance of a ROW for the Proposed Action is consistent with the terms, conditions, and decisions of the White Pine County Public Lands Policy Plan as adopted by the White Pine County Board of County Commissioners (White Pine County Public Land Users Advisory Committee 2007). Although the plan does not include specific policies related to renewable energy development, the Proposed Action is consistent with Policy 11-2: "All energy proposals should attain the lowest feasible emissions, the highest feasible efficiencies and the highest possible standards using Best Available Control Technology."

This EA also complies with the *BLM Final Wind Energy Development Policy* (IM No. 2009-043).

The issuance of a ROW for the Proposed Action is also consistent with all relevant federal, state, and local statutes, regulations, and plans. The known federal, state, and local agencies' approvals, reviews, and permitting requirements that are anticipated to be needed for these new electrical facilities are in Table 2.7-1.

Bald and/or golden eagles may now or hereafter be found to utilize the project area. In conformance with the Bald and Golden Eagle Protection Act (BGEA) and BLM IM 2010-156, the BLM will not issue a notice to proceed for any project that is likely to result in take of bald eagles and/or golden eagles until the applicant completes its obligation under applicable requirements of the BGEA, including completion of any required procedure for coordination with the USFWS or any required permit. The BGEA is a dynamic and adaptable process which may require the applicant to conduct further analysis and mitigation following assessment of operational impacts. Any additional analysis or mitigation required to comply with the BGEA would be developed with the USFWS and coordinated with the BLM.

Table 2.7-1. Authorizations Table

Authorization	Agency Authority	Statutory Reference
Federal		
ROW for Land under Federal Management	BLM	FLPMA of 1976 (PL 94-579); 43 USC 1761–1771; 43 CFR 2800
NEPA Compliance to grant ROW (tiered to Wind Energy PEIS)	BLM	NEPA (PL 91-190, 42 USC 4321−4347, January 1, 1970, as amended by PL 94-52, July 3, 1975, PL 94-83, August 9, 1975, and PL 97-258, §4(b), Sept. 13, 1982)
Endangered Species Act Compliance	USFWS	Endangered Species Act (PL 93-205, as amended by PL 100-478 [16 USC 1531 *et seq*.]); 50 CFR 402
Migratory Bird Treaty Act	USFWS	16 USC 703–711; 50 CFR Subchapter B
Bald and Golden Eagle Protection Act	USFWS	16 USC 668−668(d)
National Historic Preservation Act (NHPA) Compliance	Nevada State Historic Preservation Office (SHPO)	NHPA 106 (PL 89-665; 16 USC 470 *et seq*.)
Notice of Proposed Construction or Alteration (Form 7460.1)	FAA	49 USC, 44718 and, if applicable, 14 CFR 77 (2005), to determine whether the structure exceeds obstruction standards or is a hazard to air navigation
Notice of Actual Construction (Form 7460-2)	FAA	14 CFR 77 (2005)
Consultation Regarding Military Radar	Department of Homeland Security	N/A
Clean Water Act Section 404 Dredge and Fill Permit	U.S. Army Corps of Engineers	33 USC 1344
State		
Clean Water Act Section 401	Nevada Division of Environmental Protection (NDEP)	33 USC 1251 *et seq*.
NHPA 106 Determination of Effect Concurrence	Nevada SHPO	16 USC 470 *et seq*., NRS 383
Utility Environmental Protection Act – Permit to Construct	Nevada Public Utility Commission	NRS 704.820-704.900, Nevada Administrative Code (NAC) 704.9063, NAC 704.9359–704.9361
Rare and Endangered Plant Permit	Nevada Division of Forestry	NRS 527.260–527.300
Native Cacti and Yucca Commercial Salvaging and Transportation Permit	Nevada Division of Forestry	NRS 527.050–527.110
Incidental Take Permit	Nevada Department of Wildlife	NRS 503.584–503.589; NAC 503.093
Operating Permit (Clean Air Act, Title V)	NDEP, Bureau of Air Pollution Control	NAC 445B, 42 USC 7401
Groundwater Discharge Permit	NDEP, Bureau of Water Pollution	NRS 445A.300−730, NAC 445A.070−348, NAC 445A.810−925
Clean Water Act, Section 402 National Pollutant Discharge Elimination System Notification for Stormwater Management during Construction	NDEP	33 USC 1251 *et seq*.
Surface Area Disturbance Permit/Dust Control Plan	NDEP	NRS 519A.180 (for small sites), NAC 445B

Table 2.7-1. Authorizations Table (Continued)

Authorization	Agency Authority	Statutory Reference
State, continued		
ROW Occupancy Permit	NDOT	NRS 408.423, 408.210, NAC 408
Over Legal Size/Load Permit	NDOT	NRS 484.437−775, NAC 484.300−580
Uniform Permit (for Transportation of Hazardous Materials)	Nevada Department of Public Safety	NAC 459.979
Assignment of Water Rights	Nevada Division of Water Resources (State Engineer)	NRS 533−534
Industrial Artificial Pond Permit	Nevada Department of Wildlife	NRS 502.390
Well Permit	Nevada Division of Water Resources	N/A
Phase I Environmental Site Assessment	NDEP	Comprehensive Environmental Response, Compensation, and Liability Act, as amended, 42 USC 9601 *et seq.*
White Pine County		
Special Use Permit or Zoning Change	White Pine County Board of Commissioners City of Ely	White Pine County Zoning Ordinance
Septic System Permit	White Pine County	White Pine County Permit
Utility Permit/Easement	Utility owner (Mount Wheeler Power)	White Pine County Permit
Building Permit	White Pine County	White Pine County Permit
Variance	White Pine County Board Of Commissioners City of Ely	White Pine County Permit

3.0 AFFECTED ENVIRONMENT

3.1 Introduction

This chapter presents the potentially affected existing environment (i.e., the physical, biological, social, and economic values and resources) of the impact area. While many issues may arise during scoping, not all of the issues raised warrant detailed analysis. Issues raised through scoping are analyzed if:

- Analysis of the issue is necessary in order to make a reasoned choice between alternatives;
- The issue is significant (an issue associated with a significant direct, indirect, or cumulative impact, or where necessary to determine the significance of impacts); or
- There is a disagreement about the best way to use a resource or resolve an unwanted resource condition or potentially significant effects of a Proposed Action or alternative.

Potential impacts to the following resources/concerns were evaluated in accordance with criteria listed above to determine whether detailed analysis was required in the EA. Consideration of some of these items occurs in order to ensure compliance with laws, statutes, or EOs that impose certain requirements on all federal actions. Other items are relevant to the management of public lands in general or to the Ely District BLM in particular.

Many times, a project would have no impact on a resource of concern or the effect would not exceed what is described in the PEIS. Impacts to resources that are beyond those described in the PEIS would require detailed analysis in this EA. Table 3.1-1 documents the evaluation of each resource/concern and rationale for inclusion or dismissal from detailed analysis in the EA.

Table 3.1-1. Resource/Concern Evaluation

Resource	Detailed Analysis Required in EA		Rationale for Dismissal from Detailed Analysis or Issue(s) Requiring Detailed Analysis
	Yes	No	
Air Resources			
Air Quality*	√		Impacts to air quality from a typical wind energy facility are discussed in Section 5.4 of the PEIS. Site-specific evaluation did not indicate any additional impacts than those already disclosed. Those include temporary increased particulate matter (dust) and heavy machinery emissions resulting from construction activities. The affected area is not within an area of non-attainment or areas where total suspended particulates or other criteria pollutants exceed Nevada air quality standards. BMPs from Section 2.2.3.2 of the PEIS are incorporated by reference and are adequate for controlling particulates and criteria pollutants.
Water Resources			
Water Quality Drinking/Ground*	√		Impacts to water quality from a typical wind energy facility are discussed in Section 5.3 of the PEIS. BMPs from Section 2.2.3.2 of the PEIS are incorporated by reference. Site-specific evaluation did not indicate that any additional impacts to groundwater quality other than those already disclosed would occur as a result of the Proposed Action. Detailed analysis is needed in the EA for surface water quality to disclose project-specific impacts.
Water Resources (Water Rights)	√		Impacts to water resources from a typical wind energy facility are discussed in Section 5.3 of the PEIS and BMPs from Section 2.2.3.2 of the PEIS are incorporated by reference. Site-specific evaluation of water rights requires detailed analysis in the EA.
Wetlands/Riparian Zones *	√		Wetlands/riparian zones could have indirect impacts and are discussed in Section 4.5.2.1.

Table 3.1-1. Resource/Concern Evaluation (Continued)

Resource	Detailed Analysis Required in EA		Rationale for Dismissal from Detailed Analysis or Issue(s) Requiring Detailed Analysis
	Yes	No	
Soil Resources			
Soils		√	A total of 111 acres (0.02% of the Spring Valley Watershed) would be removed from production in the long term. Detailed analysis is not required in the EA.
Farmlands, Prime and Unique*		√	Potential impacts to geological resources from a typical wind farm are discussed in Section 5.10.1 of the PEIS and are consistent with impacts to prime and unique farmlands anticipated for this project. Within the project area, two soil associations exist that qualify portions of the project area for prime farmland status as well as for desert land entry. No unique farmland or land of state or nationwide importance occurs within the project area. The E ½ of Section 12 has been classified for Desert Land Entry. Because prime farmlands within the project area are not currently being used and require the removal of excess salts and irrigation in order to be used, detailed analysis is not required in the EA.
Vegetation Resources			
Forest Health*		√	Forest resources occur at negligible levels within the project area and would not be affected by the Proposed Action.
Rangeland Standards and Guidelines*		√	This is not a grazing or restoration action.
Vegetation		√	Impacts to vegetation are discussed in Sections 5.9.2.1, 5.9.3.1, and 5.9.3.1.3 of the PEIS. Site-specific evaluation did not indicate any additional impacts that would occur as a result of the Proposed Action. BMPs from Section 2.2.3.2 of the PEIS are incorporated by reference and are adequate. Impacts to vegetation communities present in the project area are described in Section 4.2.2 Wildlife as impacts to habitat types. Impacts to vegetation are further described in Section 4.4.2 Grazing, as loss of vegetation available for grazing. Further detailed analysis is not required in the EA.
Sensitive Plant Species	√		Although no individuals were identified and limited potential habitat for Parish phacelia was identified in the project area, detailed analysis in the EA is required to disclose the potential impacts of the Proposed Action.
Wildlife			
General Wildlife Species (including reptiles and amphibians, small mammals, big game, waterfowl and shorebirds, songbirds, birds of prey and vultures, and bats)	√		Impacts to wildlife from a typical wind farm operation are discussed in Section 5.9 of the PEIS. BMPs for the protection of wildlife species are listed in Section 2.2.3.2 of the PEIS and Section 3 of the Ely RMP/FEIS. Detailed analysis is needed in the EA to define project specific impacts.
Migratory Birds	√		Migratory bird regulatory framework is discussed in Section 3.2.7. Impacts to migratory birds would be the same as those described in Sections 4.2.3.3, 4.2.3.4, and 4.2.3.5.
Special-status Species* (federally and state listed)	√		No Endangered Species Act listed, threatened, or endangered species or critical habitat occurs in the project area. Detailed analysis is not needed for federally listed species in the EA. BLM- and state-listed species occur or have the potential to occur in the project area. Section 5.9 in the PEIS discusses impacts to wildlife, which applies to BLM and state special-status species. A detailed analysis is required in the EA to address impacts to special-status species specifically occurring in this project area.
Wild Horses			
Wild Horses		√	Not present. There are no herd management areas within the area of analysis.

Table 3.1-1. Resource/Concern Evaluation (Continued)

Resource	Detailed Analysis Required in EA		Rationale for Dismissal from Detailed Analysis or Issue(s) Requiring Detailed Analysis
	Yes	No	
Cultural Resources			
Cultural Resources*	√		Impacts to cultural resources from a typical wind energy facility are discussed in Section 5.12 of the PEIS. A Class III intensive cultural resource inventory was conducted on all portions of the project area that might be subject to ground-disturbing actions. All known cultural resource sites eligible for the National Register of Historic Places would be avoided. If any cultural resource sites were discovered during implementation of this project, all work would cease within the vicinity of the site and the BLM Archaeologist would be contacted immediately. Detailed analysis is needed in the EA to define project-specific impacts.
Heritage Special Designations		√	The Proposed Action is located 50 miles south of the Pony Express Trail and is not in the viewshed. Detailed analysis in the EA is not required.
Paleontological Resources			
Paleontological Resources		√	Impacts to paleontological resources from a typical wind energy facility are discussed in Section 5.2 of the PEIS. After evaluation of the geological and sedimentary context of the project area, it has been determined unlikely that paleontological resources exist, and no surveys or additional research is necessary. If any resources were discovered during implementation of this project, all work in the vicinity would cease and the BLM Archaeologist/Paleontologist would be contacted immediately. Detailed analysis in the EA is not required.
Visual Resources			
Visual Resources	√		Although the Visual Resource Assessment determined that the project meets the Class III VRM criteria established in the Ely RMP/FEIS, impacts to visual resources and Night Skies in Spring Valley and GBNP would occur from the introduction of large WTGs and associated facilities to a predominantly undeveloped landscape. Detailed analysis is needed in the EA to define project-specific impacts.
Land and Realty/Renewable Energy			
Land Uses	√		A Case Recordation Geo report with customer search was conducted on November 4, 2009, using BLM's GeoCommunicator (BLM 2009) and LR 2000 database. Six authorized ROW grants are located within the project area. Detailed analysis is needed in the EA to define project-specific impacts. The SWIP corridor does not overlap the Proposed Action or Alternative project areas.
Travel Management			
Transportation/Access	√		The Proposed Action calls for new roads to be constructed through the project area. Detailed analysis is needed in the EA to define project-specific impacts.
Recreation			
Recreation Uses, including Backcountry Byways, Caves, and Rockhounding Areas	√		The project area is within the Loneliest Highway SRMA. There is a potential for impacts to hunting, as well as a change in the physical and social setting of the project area. Detailed analysis is needed in the EA to define project-specific impacts.
Grazing			
Grazing Uses/Forage (Bastian Creek Allotment and Majors Allotment)	√		At least four towers with associated roads and underground transmission lines would be constructed within a cost-share range restoration project that was performed in fall 2007. In addition, livestock would be excluded from the project area until short-term disturbance areas have re-established vegetation. Detailed analysis is needed in the EA to define project-specific impacts.

Table 3.1-1. Resource/Concern Evaluation (Continued)

Resource	Detailed Analysis Required in EA		Rationale for Dismissal from Detailed Analysis or Issue(s) Requiring Detailed Analysis
	Yes	No	
Forest and Woodland Products			
Forest/Woodland and Other Vegetative Products (native seeds, yucca and cactus plants)		√	No forest/woodland products of concern are present in the project area.
Geology and Mineral Extraction			
Mineral Resources		√	Impacts to mineral resources from a typical wind energy facility are discussed in Section 5.1 of the PEIS. Site-specific evaluation did not indicate any additional impacts that would occur as a result of the Proposed Action. BMPs from Section 2.2.3.2 of the PEIS are incorporated by reference and are adequate. Detailed analysis is not required in the EA.
Watershed			
Watershed		√	Impacts to soil resources from a typical wind energy facility are discussed in Section 5.1 of the PEIS. Impacts to vegetation are discussed in Sections 5.9.2.1, 5.9.3.1, and 5.9.3.1.3 of the PEIS. Site-specific evaluation did not indicate any additional impacts that would occur as a result of the Proposed Action. BMPs from Section 2.2.3.2 of the PEIS are incorporated by reference and are adequate. Detailed analysis is not required in the EA.
Floodplains*		√	Although there are low-lying areas where water can pool, there are no floodplains in the project area.
Fire			
Fuels		√	No fuels projects are planned for the project area.
Emergency Stabilization and Rehabilitation		√	No emergency stabilization and rehabilitation projects are under way within the project area.
Noxious and Invasive Weeds			
Non-native Invasive and Noxious Species*		√	A Weed Risk Assessment was completed by the BLM for the Proposed Action in March 2009 (Appendix G). The risk rating for this project was determined to be high, and preventive measures for noxious and invasive weeds are necessary. The project could potentially increase and introduce non-native invasive and noxious species to the area. With the implementation of preventive measures identified in the Weed Risk Assessment (see Appendix G), Restoration and Weed Management Plan (see Appendix A), and BMPs referenced in the Proposed Action (Section 2.1.4 above), all impacts would be negligible. Detailed analysis is not required in the EA.
Special Designations			
ACECs*	√		Concerns were raised over the proximity to Rose Guano Cave ACEC and about the potential for construction activities to excavate or drill to levels that may puncture the perched water table, which supports the rare vegetation found in the Swamp Cedar ACEC. Detailed analysis is needed in the EA to define project-specific impacts.
Wilderness/WSA*		√	An evaluation of wilderness characteristics was done using forms provided in BLM Handbook H-6300-1 and it was determined that no wilderness characteristics are present.
Wild and Scenic Rivers*		√	Not present.

Table 3.1-1. Resource/Concern Evaluation (Continued)

Resource	Detailed Analysis Required in EA		Rationale for Dismissal from Detailed Analysis or Issue(s) Requiring Detailed Analysis
	Yes	No	
Other Concerns			
Human Health and Safety*		√	Herbicides may be used for noxious weed control. With proper use of herbicides and implementation of safety measures and BMPs referenced in the Proposed Action (Section 2.1.4 above), there would be no negative effect on human health, and detailed analysis is not required in the EA.
Noise	√		Noise impacts from a typical wind energy facility are discussed in Section 5.5 of the PEIS. During operations, sources of noise would consist of mechanical and aerodynamic noise of WTGs; transformer and switchgear noise from the substation and switching yard; corona noise from transmission lines; vehicular traffic noise, and noise from the O&M building. These sources would result in an increase in the ambient noise level in and around the project area. Detailed analysis is needed in the EA to define project-specific impacts.
Native American Religious Concerns*	√		In early scoping and through BLM tribal consultation, concerns were raised about Native American burials in or near the Swamp Cedar ACEC and in the vicinity of the affected area. An ethnographic report was prepared, and an avoidance area was delineated that included the ACEC and other areas understood to be sacred through the ethnographic report and tribal consultation. Detailed analysis is needed in the EA to define project-specific impacts.
Wastes, Hazardous or Solid*		√	Impacts from hazardous wastes associated with a typical wind energy facility are discussed in Sections 5.6, 5.9.2.1.3, 5.9.2.2.7, 5.9.2.3.4, 5.9.3.1, and 5.9.3.2.5 of the PEIS. No hazardous or solid wastes have been observed or are known to occur in the project area. BMPs from Section 2.2.3.2 of the PEIS are incorporated by reference and are adequate. Detailed analysis is not required in the EA.
Public Safety		√	The project could potentially result in increased public safety issues during the construction phase. With the implementation of safety measures and BMPs referenced in the Proposed Action (Section 2.1.4 above), the effect on public safety would be negligible, and detailed analysis is not required in the EA. The SVWEF comprises mechanical and electrical equipment now in common use strung together to produce electrical power. The facility is proposed for an area far removed from the general population. Few people would come close to the generating or transmitting equipment. The proposed SVWEF presents an unlikely target for an intentionally destructive act and has an extremely low probability of attack. Security fencing and lighting would surround the substation and operations and maintenance building. The limited access in addition to the remoteness of the project site would deter intruders. Theft or opportunistic vandalism would be more likely than sabotage or terrorist acts. The results of any such acts could be expensive to repair, but no substantial impacts to continued electrical service would be anticipated. No substantial environmental impacts would be expected from physical damage to the proposed project or from loss of power delivery; therefore, detailed analysis is not required in the EA.
Environmental Justice*		√	No minority or low-income groups would be disproportionately affected by health or environmental effects.
Socioeconomics	√		Impacts from a long-term increase in employment opportunities, as well as long-term beneficial impacts from an increase in property tax and indirect long-term beneficial impacts from an increase in sales and income tax from operation of a typical wind energy facility, are discussed in Section 5.13.1 of the PEIS. Detailed analysis is needed in the EA to define project-specific impacts.

* Nevada Supplemental Authority.

3.2 Wildlife

Wildlife found in the project area are those species typically associated with Inter-Mountain Basins Mixed Salt Desert Scrub (mixed salt desert scrub), Inter-Mountain Basins Big Sagebrush Shrubland (big sagebrush shrubland), and Great Basin Xeric Mixed Sagebrush Shrubland (mixed sagebrush shrubland), which account for 99% of the project area (U.S. Geological Survey [USGS] 2004). These communities are present throughout the Spring Valley Watershed, which provides a total of 581,213 acres of habitat. These plant communities provide habitat for a variety of wildlife species ranging from common reptiles, birds, and mammals to species of management concern, such as migratory birds or special-status species. This section discusses general wildlife species that have the potential to occur within Spring Valley and are representative of the wildlife occurring in the project area. General wildlife observations were made by SWCA biologists throughout the course of approximately two years of bird and bat surveys conducted at the project area. Throughout surveys, biologists noted all general wildlife species that were observed. In addition to those species observed, most species typical of the region as described in the Ely RMP/FEIS (BLM 2008a) occur or have potential to occur in the project area.

3.2.1 Reptiles and Amphibians

Reptile species occur throughout the project area and are representative of typical Great Basin wildlife. Most reptiles are widespread in the project area, while amphibians are habitat specialists requiring water for at least part of their life cycle. Widespread lizards are represented by species such as western fence lizard (*Sceloporus occidentalis*) and northern side-blotched lizard (*Uta stansburiana*), which were observed on-site during surveys. Snake species are somewhat less widespread; Great Basin rattlesnake (*Crotalus lutosus*), striped whipsnake (*Masticophis taeniatus*), and gophersnake (*Pituophis catenifer*) are representative snakes observed in the project area. The only amphibian observed during surveys was the Great Basin spadefoot toad (*Spea intermontana*), which uses dry areas with loose soil for burrowing and spring areas during breeding.

None of these general reptile and amphibian species are afforded any state or federal protection; therefore, there was no attempt to quantify the size of these species' populations or species' specific use within the project area.

3.2.2 Small Mammals

Most mammals occurring in Spring Valley and the project area are nocturnal, but they may occasionally be seen during the day. Habitat for small mammals is widespread in Spring Valley, with most of the 581,213 acres providing habitat for at least some small-mammal species. Small-mammal species that were observed during surveys and are representative of the small mammals occurring on-site include the black-tailed jackrabbit (*Lepus californicus*), cottontail (*Sylvilagus audubonii*), white-tailed antelope ground squirrel (*Ammospermophilus lecurus*), and desert woodrat (*Neotoma lepida*).

With the exception of pygmy rabbit which is described in Section 3.3.1, small mammals in the area are not federally or state-listed sensitive species. Some small mammals such as cottontail are protected in Nevada as game species. There are no specific protocols or requirements in place for development projects to analyze presence/absence or population density of non-sensitive or game species. Therefore, specific studies to quantity population sizes within the project area were not completed. Based on habitat within the project area, it is assumed that small-mammal populations are similar to other parts of the Spring Valley watershed.

3.2.3 Big-Game Species

Big-game species that occur or have the potential to occur in the project area include pronghorn antelope, mule deer (*Odocoileus hemionus*), and elk (*Cervus canadensis*) (Figure 3.2-1). Pronghorn antelope use most of the Spring Valley watershed (581,213 acres) and were observed by SWCA throughout the project area during every season. Mule deer were only observed on a few isolated occasions and are not thought to commonly use the project area (see Figure 3.2-1). NDOW states that most mule deer in Game Management Unit 111 are found between 7,500 feet and 10,500 feet above mean sea level (amsl) (NDOW 2009). Over the two years of fieldwork in the project area, elk were never observed in the project area by SWCA, and it is suspected that they use habitat in the project area to a limited degree. They were, however, observed immediately adjacent to the project area, west of SR 893, and are known to occur in relatively high densities in Game Management Unit 111, which encompasses the project area. Spatial data from the Ely RMP show that elk and mule deer crucial habitat does not occur within the project area, while year-round pronghorn habitat does (BLM 2008a).

The mountain lion (*Felis concolor*) is a big-game species in Nevada that occurs in White Pine County. In Nevada, lions are found in areas of pinyon pine, juniper, mountain mahogany, ponderosa pine, and mountain brush (NDOW 2010). These habitats occur near the project area but not within it. Lions generally will be most abundant in areas where deer are plentiful. In Nevada, male home ranges can be as large as 115 square miles, and female ranges are much smaller, averaging about 25 square miles (NDOW 2010). Therefore, although the project area does not contain typical mountain lion habitat, habitat is nearby and the project area could occur within mountain lion territory.

3.2.4 Waterfowl and Shorebirds

The PEIS identifies portions of Nevada as occurring within the Pacific Flyway (Figure 4.6.2-1 of the PEIS). The easternmost route of this flyway is thought to diverge west around the Great Salt Lake in Utah and continue southwest toward the Lahontan Valley, east of Reno, before joining the major flyway traveling through California's Central Valley. Therefore, while migrant waterfowl and shorebirds undoubtedly fly through Spring Valley, no major or principal migration route within the Pacific Flyway is thought to occur in Spring Valley.

Biologists conducted more than 170 hours of general bird surveys over nearly two years of preconstruction studies. During migratory passerine surveys, general use surveys, and breeding bird point-counts, all birds observed were recorded, including all species of waterfowl and shorebirds. Surveys were conducted during all months of the year in all weather conditions. In total, 21 different species of waterfowl and shorebirds (includes cranes, ducks, egrets, geese, gulls, and shorebirds) were identified (Table 3.2-1). Two of these species were identified during breeding bird point-counts: long-billed curlew (*Numenius minutus*) and sandhill crane (*Grus canadensis*). While both of these species use the project area to some degree, no evidence of breeding was observed for either species within the project area; however, both species are known to breed from the Shoshone, Nevada, area (Floyd et al. 2007), approximately 15 miles south of the project area. Long-billed curlews are also discussed in the Special-status Species Section (Section 3.3.2). An adult killdeer (*Charadrius vociferus*) was incidentally observed with fledglings near 4wd Spring, at the north end of the project area. For an in-depth examination of the results of bird surveys in the project area, refer to the *Spring Valley Wind Power Generating Facility Final Pre-construction Survey Results Report* (SWCA 2009a).

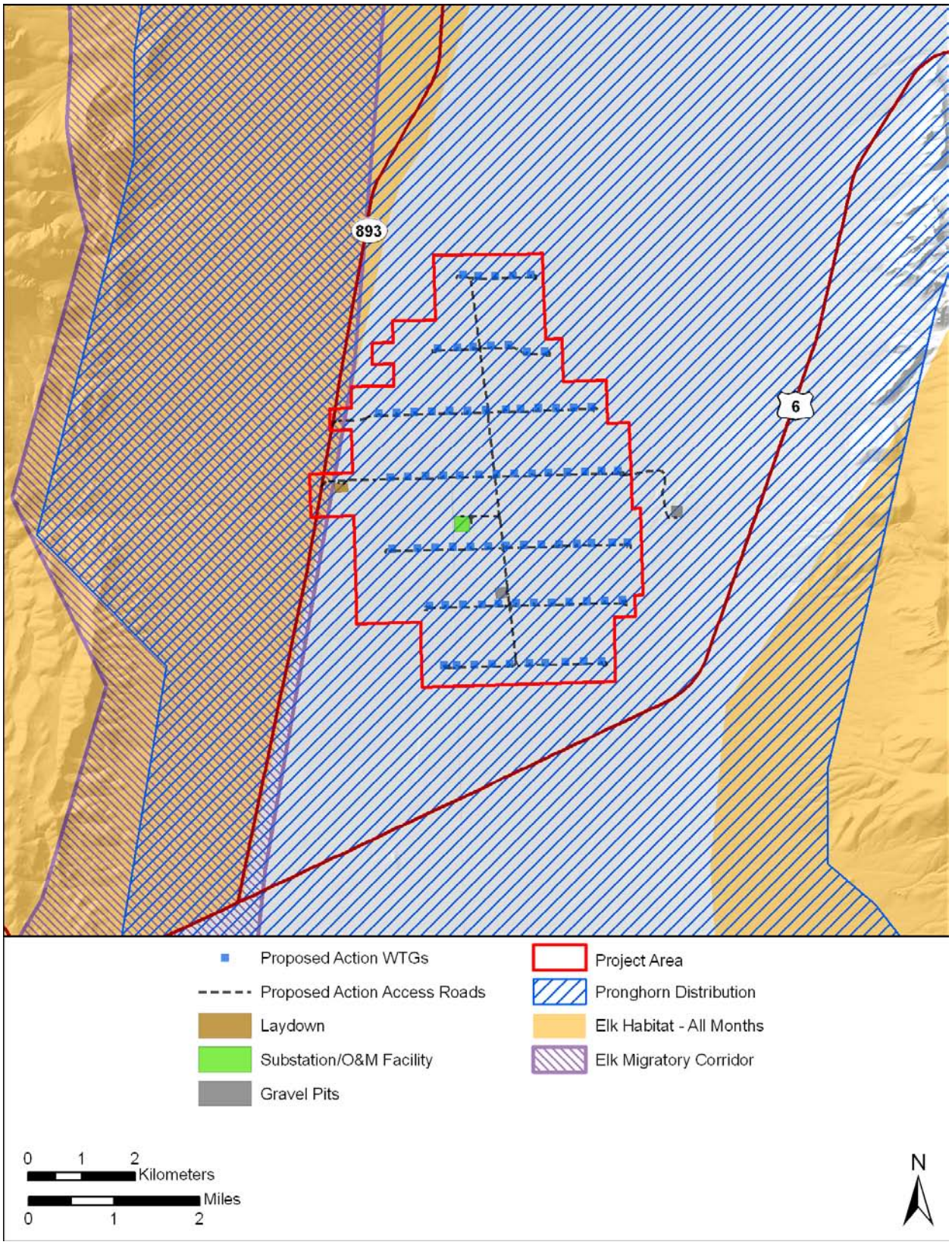

Figure 3.2-1. Big-game use areas.

Table 3.2-1. Waterfowl and Shorebirds Recorded in the Project Area

Common Name	Scientific Name
American wigeon	*Anas americana*
Blue-winged teal	*Anas discors*
Bufflehead	*Bucephala albeola*
California gull	*Larus californicus*
Canada goose	*Branta canadensis*
Cinnamon teal	*Anas cyanoptera*
Eared grebe	*Podiceps nigricollis*
Franklin's gull	*Larus pipixcan*
Gadwall	*Anas strepera*
Great egret	*Ardea alba*
Green-winged teal	*Anas crecca*
Killdeer*	*Charadrius vociferus*
Least sandpiper	*Calidris minutilla*
Long-billed curlew	*Numenius minutus*
Mallard	*Anas platyrhynchos*
Northern pintail	*Anas acuta*
Northern shoveler	*Anas clypeata*
Ring-necked duck	*Aythya collaris*
Sandhill crane	*Grus canadensis*
Snow goose	*Chen caerulescens*
Willet	*Tringa semipalmata*

*Denotes species observed breeding or not observed but expected to breed in the project area.

3.2.5 Songbirds

Biologists conducted more than 170 hours of bird surveys during nearly two years of preconstruction studies. For migratory passerine surveys, general use surveys, and breeding bird point-counts, all observed birds were recorded, including all songbirds. Surveys were conducted during all months of the year in all weather conditions. In total, 56 different species of songbirds were identified (Table 3.2-2), 22 of which were identified during breeding bird point-counts. While direct evidence of breeding was not observed for all of these species, breeding bird point-counts were performed during the middle of the breeding season, and it is suspected that most or all of these species were breeding in or near the project area. In total, including incidental sightings, there were seven species of songbirds confirmed to be breeding in the project area, Brewer's sparrow (*Spizella breweri*), common raven (*Corvus corax*), lark sparrow (*Chondestes grammacus*), loggerhead shrike (*Lanius ludovicianus*), sage sparrow (*Amphispiza belli*), sage thrasher (*Oreoscoptes montanus*), and black-billed magpie (*Aphanotriccus audax*). For an in-depth examination of the results of bird surveys in the project area, refer to the *Spring Valley Wind Power Generating Facility Final Pre-construction Survey Results Report* (SWCA 2009a).

Table 3.2-2. Songbirds Recorded in the Project Area

Common Name	Scientific Name
American crow	*Corvus brachyrhynchos*
American robin	*Turdus migratorius*
Ash-throated flycatcher	*Myriarchus cinerascens*
Barn swallow	*Hirundo rustica*
Belted kingfisher	*Ceryle alcyon*
Black-billed magpie*	*Aphanotriccus audax*
Black-throated sparrow*	*Amphispiza bilineata*
Blue-gray gnatcatcher*	*Polioptila caerulea*
Bohemian waxwing	*Bombycilla garrulus*
Brewer's blackbird	*Euphagus cyanocephalus*
Brewer's sparrow*	*Spizella breweri*
Bullock's oriole	*Icterus bullockii*
Chipping sparrow	*Spizella passerina*
Clark's nutcracker	*Nucifraga columbiana*
Cliff swallow	*Petrochelidon pyrrhonota*
Common grackle	*Quiscalus quiscula*
Common nighthawk*	*Chordeiles minor*
Common poorwill*	*Phalaenoptilus nuttallii*
Common raven*	*Corvus corax*
Common yellowthroat	*Geothlypis trichas*
European starling	*Sturnus vulgaris*
Gray flycatcher*	*Empidonax wrightii*
Green-tailed towhee	*Pipilo chlorurus*
Horned lark*	*Eremophila alpestris*
House finch	*Carpodacus mexicanus*
Juniper titmouse	*Baeolophus ridgwayi*
Lark sparrow*	*Chondestes grammacus*
Lincoln's sparrow	*Melospiza lincolnii*
Loggerhead shrike*	*Lanius ludovicianus*
MacGillivray's warbler	*Oporornis tolmiei*
Mountain bluebird	*Sialia currucoides*
Mountain chickadee	*Poecile gambeli*
Mourning dove*	*Zenaida macroura*
Nashville warbler	*Vermivora ruficapilla*
Northern flicker*	*Colaptes auratus*
Northern mockingbird	*Mimus polyglottos*
Northern rough-winged swallow	*Stelgidopteryx serripennis*
Orange-crowned warbler	*Vermivora celata*
Pinyon jay	*Gymnorhinus cyanocephalus*
Red-naped sapsucker	*Sphyrapicus nuchalis*

Table 3.2-2. Songbirds Recorded in the Project Area (Continued)

Common Name	Scientific Name
Red-winged blackbird	*Agelaius phoeniceus*
Ruby-crowned kinglet	*Regulus calendula*
Sage sparrow*	*Amphispiza belli*
Sage thrasher*	*Oreoscoptes montanus*
Savannah sparrow	*Passerculus sandwichensis*
Say's phoebe	*Sayornis saya*
Song sparrow	*Melospiza melodia*
Spotted towhee	*Pipilo maculatus*
Townsend's solitaire	*Myadestes townsendi*
Tree swallow	*Tachycineta bicolor*
Vesper sparrow*	*Pooecetes gramineus*
Western kingbird	*Tyrannus verticalis*
Western meadowlark*	*Sturnella neglecta*
Western scrub-say	*Aphelocoma californica*
White-crowned sparrow	*Zonotrichia leucophrys*
Yellow warbler	*Dendroica petechia*
Yellow-headed blackbird	*Xanthocephalus xanthocephalus*
Yellow-rumped warbler	*Dendroica coronata*

*Denotes species observed breeding or not observed but expected to breed in the project area.

It is known that many species of passerines migrate nocturnally. Nocturnally migrating passerines usually fly at great heights, sometimes as high as 3,037 feet (Able 1970). Therefore, it is assumed that nocturnally migrating passerines would not occur within the rotor-swept area (RSA) of the WTGs in the project area with the exception of a flock using the area as a short stopover.

3.2.6 Birds of Prey and Vultures

The PEIS identifies portions of Nevada as occurring within the Pacific Flyway (BLM 2005:Figure 4.6.2-1). The easternmost route of this flyway is thought to diverge west around the Great Salt Lake in Utah and continue southwest toward the Lahontan Valley, east of Reno, before joining the major flyway traveling through California's Central Valley. Additionally, when Jeff Smith, Conservation Science Director with HawkWatch International (HWI), was asked about raptor migration around the project area, he said, "[G]iven our low-volume results from the Ely area, I suspect that the large volume of birds we see in the Goshutes instead mostly travel south down the Snake and Deep Creek ranges farther to the east" (personal communication, Jeff Smith, HWI, to Justin Streit, SWCA 2009).

Specific surveys for raptors included two years of helicopter raptor nest surveys and raptor migration surveys. Raptor migration surveys consisted of 36 survey days over four migration seasons, resulting in over 200 hours of survey. Surveys were conducted throughout each migration season, during all weather conditions, and included days coinciding with peak migration periods at the Goshute Mountain Raptor Migration Site, monitored by HWI. The goal of raptor migration surveys was to identify whether or not Spring Valley occurs in a major migration corridor. After coordinating with HWI representatives, it was determined that a major migration corridor could be identified in a few days of surveys during optimal flight conditions. Raptor migration surveys in Spring Valley resulted in a passage rate of 0.81 bird/hour (SWCA 2009a), well below the numbers observed in the nearby Schell Creek and Duck Creek ranges

(3.2 birds/hour) and long-term averages from the Goshute Mountains 90 miles to the north (22.2 birds/hour) (Smith 2008). While raptors migrating through the Schell Creek and Snake ranges undoubtedly use Spring Valley to some degree to rest and forage during migration, it is not believed that a large volume of birds are using Spring Valley for such reasons. Large numbers of raptors resting and foraging in Spring Valley would have been counted during migratory passerine surveys, and large increases in raptor abundance were not noted during migration periods.

Helicopter surveys performed specifically for nesting raptors within the project area and a 1-mile buffer revealed multiple nesting pairs of ferruginous and Swainson's hawks (SWCA 2009a). Of 25 raptor nests observed during helicopter surveys conducted in 2007 and 2008, three inactive nests and only one active raptor nest were observed in the current project area—a Swainson's hawk nest in the northern portion of the project area that fledged two chicks. The remaining nests are located within the initial northern project area or the 1-mile buffer but outside the current project area. Additionally, it is suspected that both northern harriers and American kestrels breed in the project area, although definitive evidence was never directly observed. No golden eagles were observed nesting within the project area or surrounding 1-mile buffer, and no golden eagles were observed during breeding bird point-counts. Nesting raptor data provided by NDOW shows one known nest approximately 4 miles from the project area and another 8 miles away. However, these nests have not been checked for activity in almost 30 years. During surveys for the Atlas of the Breeding Birds of Nevada from 1997 to 2000, Floyd et al. (2007) found the closest breeding pair of golden eagles in the Schell Creek Range, northwest of the project area. This nest appears to be more than 10 miles away from the project area, but the exact location is unknown.

NDOW has said that western screech-owls (*Megascops kennicottii*) have been detected from the nearby Swamp Cedar ACEC, and they have been added to Table 3.2-3 as well. However, because occurrence data cannot be found for this species in the area and habitat in Spring Valley is limited (Floyd et al. 2007), it is assumed that this species rarely enters the project area. Additionally, raptor observations were recorded during other bird surveys, including migratory passerine surveys, general-use surveys (covered winter months), and breeding bird point-counts. Throughout all surveys, 15 different species of birds of prey and vultures were identified (Table 3.2-3). Five of these species were observed during breeding bird point-counts, including American kestrel (*Falco sparverius*), ferruginous hawk (*Buteo regalis*), northern harrier (*Circus cyaneus*), Swainson's hawk (*Buteo swainsoni*), and turkey vulture (*Cathartes aura*). For an in-depth examination of the results of bird surveys in the project area, refer to the *Spring Valley Wind Power Generating Facility Final Pre-construction Survey Results Report* (SWCA 2009a).

Table 3.2-3. Birds of Prey and Vultures Recorded in the Project Area

Common Name	Scientific Name
American kestrel*	*Falco sparverius*
Bald eagle	*Haliaeetus leucocephalus*
Cooper's hawk	*Accipiter cooperii*
Ferruginous hawk	*Buteo regalis*
Golden eagle	*Aquila chrysaetos*
Great horned owl	*Bubo virginianus*
Long-eared owl	*Asio otus*
Northern harrier*	*Circus cyaneus*
Prairie falcon	*Falco mexicanus*
Red-tailed hawk	*Buteo jamaicensis*
Rough-legged hawk	*Buteo lagopus*

Table 3.2-3. Birds of Prey and Vultures Recorded in the Project Area (Continued)

Common Name	Scientific Name
Sharp-shinned hawk	*Accipiter striatus*
Swainson's hawk*	*Buteo swainsoni*
Turkey vulture	*Cathartes aura*
Western burrowing owl	*Athene cunicularia hypugaea*
Western screech-owl+	*Megascops kennicottii*

* Denotes species observed breeding or not observed but expected to breed in the project area.

+ This species was not observed during field surveys.

3.2.7 Regulatory Framework for Protection of Birds

Based on existing data and preconstruction surveys (SWCA 2009a), the project area does not occur within a major migration corridor. The regulatory framework for protecting birds includes the Endangered Species Act (ESA), the Migratory Bird Treaty Act (MBTA) (which includes any part, nest, or egg), the Bald and Golden Eagle Protection Act of 1940, and EO 13186. The PEIS discusses the ESA in Section 4.6.5.1, and other regulations stated above are discussed in Section 4.6.2.2.6 of the PEIS. All of the birds observed during preconstruction surveys are protected by the MBTA, with the exception of the European starling (*Sturnus vulgaris*). The MBTA prohibits the take of migratory birds and does not include provisions for allowing unauthorized take. This project affords substantial design measures to avoid the likelihood of take, and if take occurs, it would be reported to the USFWS for further action. Additionally, the BLM and USFWS are developing a project ABPP (see Appendix F) to meet BLMs requirements for addressing the MBTA. The BGEA is similar to the MBTA in that it prohibits the take of bald and golden eagles. However, on September 11, 2009, a final rule was published in the *Federal Register* (50 CFR 13 and 22) that allows the USFWS to issue permits for the take of bald eagles. Although the BGEA's regulations do provide a process for obtaining incidental take permits for eagles, the USFWS is not currently issuing such permits. This project affords substantial design measures to avoid the likelihood of take, and if take occurs, it would be reported to the USFWS for further action. The ABPP also addresses BLMs requirements for addressing the BGEA under BLM IM 2010-156.

3.2.8 Bats

As recommended by the PEIS (BLM 2005), bat use of the project area was evaluated with the goal of developing the project in a way that minimizes or mitigates impacts to bats, which have been killed in high numbers at some wind energy facilities. The project area is located within or immediately adjacent to a major Brazilian free-tailed bat (*Tadarida brasiliensis*) migratory corridor. Rose Guano Cave (located approximately 4 miles east of the nearest proposed WTG within the project area) serves as a migratory stopover for over 1 million individual Brazilian free-tailed bats during fall migration (Sherwin 2009).

In order to identify bat use of the project area, comprehensive bat acoustic surveys of the project area were initiated July 2007 and continued through December 2008 using 10 AnaBat acoustic detectors. In total, 5,072 detector nights of data were collected from these efforts. AnaBat detectors were placed within different habitat types and near water resources, which were expected to attract high numbers of bats. Both perennial and ephemeral water resources typically have concentrated bat activity and can generate substantial volumes of data (O'Farrell and Gannon 1999), which can be useful for creating a complete species inventory. In addition to acoustic surveys, a recent survey was conducted by Sherwin (2009) in conjunction with the BLM and NDOW, which evaluated the use of the Rose Guano Cave by the Brazilian free-tailed bat. That study is described further in the special-status species section for bats (Section 3.3.6).

Acoustic surveys identified 12 of the 23 bat species known to occur in Nevada (all from the Verspertilionidae and Molossidae families). Acoustic data indicate that approximately 91% of all recorded activity could be attributed to four bat species: western small-footed myotis (*Myotis ciliolabrum*), long-eared myotis (*Myotis evotis*), little brown bat (*Myotis lucifugus*), and Brazilian free-tailed bat (Table 3.2-4). The high activity levels associated with these four species indicates that they are relatively common within the project area, at least seasonally.

Table 3.2-4. Bat Species Activity Levels

Common Name	Scientific Name	% of Total Data
Western small-footed myotis	*Myotis ciliolabrum*	41.5
Little brown bat	*Myotis lucifugus*	25.6
Long-eared myotis	*Myotis evotis*	12.5
Brazilian free-tailed bat	*Tadarida brasiliensis*	11.4
Long-legged myotis	*Myotis volans*	3.4
Big brown bat	*Eptesicus fuscus*	2.1
Silver haired bat	*Lasionycteris noctivagans*	1.4
Pallid bat	*Antrozous pallidus*	1.2
Hoary bat	*Lasiurus cinereus*	0.5
Townsend's big-eared bat	*Corynorhinus townsendii*	0.4
Western red bat	*Lasiurus blossevillii*	0.0*
Yuma myotis	*Myotis yumanensis*	0.0*

* This bat species was detected but contributed less than 0.1% of the total data.

While any species of bat could be injured or killed from wind turbines, six species observed, including the little brown bat, big brown bat (*Eptesicus fuscus*), silver-haired bat (*Lasionycteris nocitvagans*), hoary bat (*Lasiurus cinereus*), western red bat (*Lasiurus blossevilli*), and Brazilian free-tailed bat, have been documented as mortalities at other wind energy facilities in the western United States (Arnett et al. 2008; BLM 2005; Kerlinger et al. 2006) and should be considered to be at increased risk of mortality. Four of these species are state protected, including the Brazilian free-tailed bat, pallid bat (*Antrozous pallidus*), Townsend's big-eared bat (*Corynorhinus townsendii*), and western red bat. State-protected bat species are described in detail under Sensitive Species section in Section 3.3.6.

Statistically significant variations in bat activity levels between AnaBat monitoring stations indicate that environmental site characteristics strongly influence bat activity (SWCA 2009a). Bat use of the project area is not homogeneous, with concentrated activity occurring near water sources and near Rocky Mountain juniper (*Juniperus scopulorum*) (SWCA 2009a). However, due to the highly mobile nature of bats, a given species may be found throughout the project area on any particular night.

Acoustic data also indicate that bat activity in the project area (based on total Index of Activity from all 10 Anabat units) varies greatly between different seasons, with total activity peaking during summer months (Figure 3.2-2). Activity levels also vary within the night, as acoustic data show peak activity occurring at 2.5 hours after sunset, with an additional, smaller peak in activity occurring at 6.5 hours after sunset (SWCA 2009a). Detailed examination of the AnaBat acoustic study results are presented in SWCA (2009a).

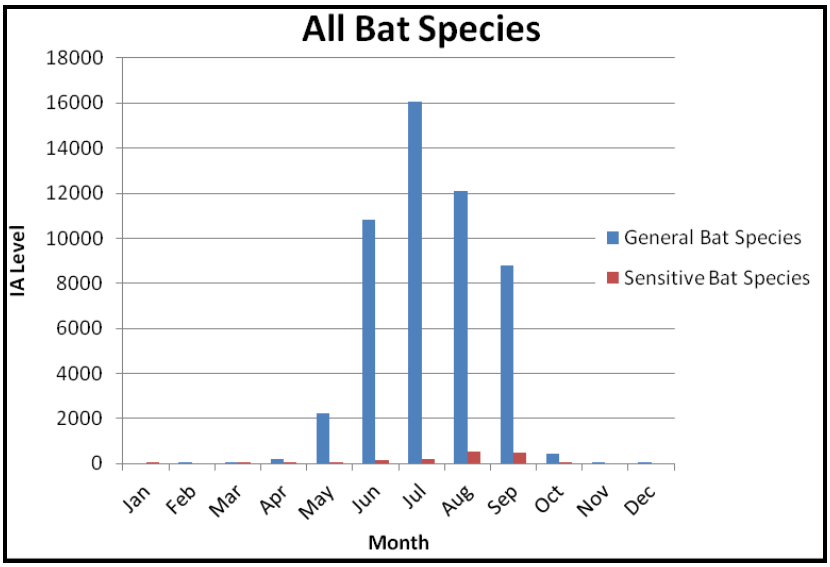

Figure 3.2-2. Seasonal activity patterns of all bat species, 2007–2008 (IA – Index of Activity).

3.3 Special-Status Species

This section discusses specific special-status species of concern that have the potential to occur within the project area. As shown in Table 3.3-1, some species have wide-ranging habitat throughout Spring Valley, while others are limited to special vegetation types. There are no federally listed species that are known to occur in the project area. Species included on the protected species list for the State of Nevada, which is maintained by the Nevada Natural Heritage Program (NNHP), are protected under NRS 501 and Nevada Administrative Code (NAC) 503.093, which states that a person shall not hunt or take any wildlife that is classified as protected, or possess any part thereof, without first obtaining the appropriate license, permit or written authorization from the NDOW. There are 24 wildlife species and one plant species protected by the State of Nevada that have potential to occur in the project area (Table 3.3-2). Those native taxa that are neither federally listed, proposed, or candidate species under the ESA, nor listed as protected by the State of Nevada, yet meet the criteria provided in BLM Manual 6840.06 E are also considered special-status Species by the Nevada BLM (BLM 1998). The BLM 6840 Manual (BLM 2008a) describes special-status species as 1) species listed or proposed for listing under the ESA and 2) species requiring special management consideration to promote their conservation and reduce the likelihood and need for future listing under the ESA, which are designated BLM Sensitive by the State Director(s). One plant species and several wildlife species listed as BLM special status occur or have the potential to occur in the project area. All BLM special-status species are also Nevada State protected species.

3.3.1 Small Mammals

Pygmy rabbit is the only special-status mammal occurring in the project area. It is fully protected by the State of Nevada and is a BLM special-status species in Nevada. It has also been petitioned for listing under the ESA. The USFWS is currently undertaking a 12-month finding to determine whether available information warrants listing of the pygmy rabbit under the ESA.

On August 12, 2008, SWCA biologists conducted surveys for pygmy rabbit habitat and their habitat as described by NDOW (2004) and Ulmschneider (2004), respectively. During the first round of pygmy rabbit surveys, one active and one inactive burrow were observed. The active burrow had multiple entrances, although only one showed recent use. A small amount of light brown pellets was observed

around the entrances among numerous faded gray pellets. The inactive burrow was collapsed near the entrance, but there were numerous old gray pellets around the entrance. Biologists returned on December 17, 2008, and confirmed pygmy rabbit activity at the previously identified active burrow, which was evidenced by multiple cleared burrow entrances and numerous tracks and scat.

Table 3.3-1. Special-Status Species Habitat Availability

Habitat Type*	Spring Valley Watershed (acres)	Proposed Action (acres)	Alternate Development Alternative (acres)	Species Association(s)
Pinyon Juniper	120,646	8	2	Songbirds, birds of prey, bats
Sagebrush	174,141	3,643	3,417	Pygmy rabbit, long-billed curlew, songbirds, greater sage-grouse, birds of prey, bats
Mixed Desert Scrub	146,284	4,896	4,244	Songbirds, birds of prey, bats
Greasewood	1,652	17	10	Songbirds, birds of prey, bats
Other Vegetation Communities Outside Project Area	123,614	0	0	All species may use some or all of these communities
Total	**581,213**	**8,564**	**7,673**	

* USGS (2004).

Table 3.3-2. Special-Status Species

Common Name	Scientific Name	Status
Small Mammals		
Pygmy rabbit	*Brachylagus idahoensis*	NV protected; BLM Sensitive
Waterfowl and Shorebirds		
Long-billed Curlew	*Numenius minutus*	NV protected; BLM Sensitive
Sandhill Crane	*Grus canadensis*	NV protected; BLM Sensitive
Willett	*Tringa semipalmata*	NV protected; BLM Sensitive
Songbirds		
Sage thrasher	*Oreoscoptes montanus*	NV protected; BLM Sensitive
Brewer's sparrow	*Spizella breweri*	NV protected; BLM Sensitive
Sage sparrow	*Amphispiza belli*	NV protected; BLM Sensitive
Pinyon jay	*Gymnorhinus cyanocephalus*	NV protected; BLM Sensitive
Juniper titmouse	*Baeolophus ridgwayi*	NV protected; BLM Sensitive
Loggerhead shrike	*Lanius ludovicianus*	NV protected; BLM Sensitive
Vesper sparrow	*Pooecetes gramineus*	NV protected; BLM Sensitive
Red-naped sapsucker	*Sphyrapicus nuchalis*	NV protected; BLM Sensitive
Gallinaceous Birds		
Greater sage grouse	*Centrocercus urophasianus*	NV protected; BLM Sensitive
Birds of Prey and Vultures		
Bald eagle	*Haliaeetus leucocephalus*	NV protected; BLM Sensitive
Ferruginous hawk	*Buteo regalis*	NV protected; BLM Sensitive
Golden eagle	*Aquila chrysaetos*	NV protected; BLM Sensitive
Swainson's hawk	*Buteo swainsoni*	NV protected; BLM Sensitive

Table 3.3-2. Special-status Species (Continued)

Common Name	Scientific Name	Status
Birds of Prey and Vultures, continued		
Prairie falcon	*Falco mexicanus*	NV protected; BLM Sensitive
Northern harrier	*Circus cyaneus*	NV protected; BLM Sensitive
Long-eared owl	*Asio otus*	NV protected; BLM Sensitive
Western burrowing owl	*Athene cunicularia hypugaea*	NV protected; BLM Sensitive
Bats		
Pallid bat	*Antrozous pallidus*	NV protected; BLM Sensitive
Townsend's big-eared bat	*Corynorhinus townsendii*	NV protected; BLM Sensitive
Western red bat	*Lasiurus blossevilli*	NV protected; BLM Sensitive
Brazilian free-tailed bat	*Tadarida brasiliensis*	NV protected; BLM Sensitive
Western small-footed myotis	*Myotis ciliolabrum*	NV protected; BLM Sensitive
Spotted bat	*Euderma maculatum*	NV protected
Western Mastiff bat	*Eumops perotis*	NV protected
Allen's big-eared bat	*Idionycteris phyllotis*	NV protected
California leaf-nosed bat	*Macrotus californicus*	NV protected
Fringed myotis	*Myotis thysanodes*	NV protected

Following modification to the project area, SWCA returned on January 8, 2009, and August 5, 2009, to survey for pygmy rabbit in previously unsurveyed areas, using the same methodology. On the first of these visits, suitable habitat was located within the southeastern portion of the project area. One pygmy rabbit burrow was located during these surveys, and pellets at the burrow entrance appeared to be fairly fresh, although the burrow entrance did not show signs of recent use. During the second visit, suitable habitat was located along the eastern project area boundary and in the extreme southwest corner of the project area. At least two individual pygmy rabbits were seen in this southwestern patch of habitat, verifying that some of the sagebrush identified earlier as potential habitat is in fact occupied by pygmy rabbits.

Up to 3,643.2 acres of potential habitat was identified through GIS analysis of sagebrush vegetation communities (USGS 2004). Of the total, 89.6 acres were identified as high-quality habitat containing tall, dense sagebrush typically used by pygmy rabbits (USFWS 2009). Based on the observation of pygmy rabbits or active burrow systems, 61.0 acres were considered occupied pygmy rabbit habitat (SWCA 2009b).

3.3.2 Waterfowl and Shorebirds

In total, 21 different species of waterfowl and shorebirds (includes cranes, ducks, egrets, geese, gulls, and shorebirds) were identified within the project area. Observations of waterfowl and shorebirds occurred over the course of two years of general-use, breeding bird, and passerine migration surveys, which included more than 170 hours of survey (SWCA 2009a). Of the 21 species, three special-status species—long-billed curlew, sandhill crane, and willet (*Tringa semipalmata*)—were observed in the project area.

The long-billed curlew, while designated as a wading bird, was mostly observed in upland areas. This species will forage around wetland areas but is known to extensively use upland areas for nesting, brood rearing, and foraging. Thirteen individual long-billed curlews were observed during surveys, and more than 30% of these were observed flying in the proposed RSA. This species was also detected twice

during breeding bird point-counts. However, as of 2005, long-billed curlew mortalities have not been recorded at other WGFs (Kingsley and Whittam 2005). Almost all observations of this species occurred between March and June, usually in sagebrush habitats.

Sandhill crane was a relatively uncommon species, with only six observations (1.9% of surveys) during migratory passerine surveys (all in March) and one detection (single calling bird) during breeding bird point-count surveys. Only one of the seven sandhill crane detections was of a bird flying in the anticipated RSA. As of 2005, this species had not been a recorded fatality at any WGF (Kingsley and Whittam 2005). This species, which was most commonly observed near wetland areas, is usually associated with water and therefore may only be present in the project area during those times of the year when water is present. Additionally, almost all observations of this bird occurred within portions of the initial project area that are not part of the current project area. This bird also spends a high proportion of time on the ground while foraging and performing courtship displays (Ehrlich et al. 1988).

With only three observations (0.6% of surveys) during migratory passerine surveys, the willet was an uncommon species during preconstruction surveys. This species was never observed in the RSA and was only seen near one ephemeral pond, well north of the current project area.

3.3.3 Songbirds

In total, 56 species of songbirds were identified in the project area. Songbird observations occurred over the course of two years of general-use, breeding bird, and passerine migration surveys, which included more than 170 hours of survey (SWCA 2009a). These 56 species included eight special-status songbirds, including sage thrasher (*Oreoscoptes montanus),* Brewer's sparrow (*Spizella breweri*), sage sparrow (*Amphispiza belli*), pinyon jay (*Gymnorhinus cyanocephalus),* juniper titmouse (*Baeolophus ridgwayi*), loggerhead shrike (*Lanius ludovicianus*), vesper sparrow (*Pooecetes gramineus*), and red-naped sapsucker (*Sphyrapicus nuchalis*).

Brewer's sparrows were observed during 5.0% of surveys and were not recorded in the RSA. This species did exhibit breeding behavior during point-counts and was observed more than once during these surveys. Brewer's sparrow has been recorded as having at least one collision with a wind turbine at other WGFs (Kingsley and Whittam 2005).

Sage sparrow was relatively common, as it was observed during 10.0% of surveys. Like the Brewer's sparrow, this species also exhibited breeding behavior and was seen more than once during point-count surveys. As of 2005, the sage sparrow had never been recorded as a mortality at a WGF (Kingsley and Whittam 2005).

Pinyon jays were commonly observed during passerine surveys (11.3%) and were recorded flying in the RSA during 19.1% of observations. Although these birds were recorded throughout the year, they were more frequently observed during the spring and fall. During general use surveys, pinyon jays were more commonly observed during the summer than in winter. As of 2005, there were no recorded mortalities for this species from other WGF studies (Kingsley and Whittam 2005).

Juniper titmouse was relatively uncommon during avian surveys. This species was only observed during 2.5% of surveys, including both migratory and winter general-use surveys. However, this species was not observed in the RSA. Considering that titmice feed by collecting insects from the bark of trees and they are not known to perform aerial displays, the presence of this species in the RSA is expected to be limited. As of 2005, there were no recorded collision mortalities for this species (Kingsley and Whittam 2005).

Loggerhead shrike was observed fairly frequently (during 15.6% of surveys) but was never observed within the RSA during surveys. Although this species was not observed within the RSA, this species does practice aerial pursuit of the female while courting (Ehrlich et al. 1988), which could increase its time in the RSA. However, as of 2005, the only recorded loggerhead shrike mortality at a wind facility occurred in California (Kingsley and Whittam 2005). The majority (76%) of loggerhead shrike observations occurred during migration surveys, although this species was also recorded during summer general-use surveys (24%) following the breeding season. In addition, during breeding bird point-counts, this species was observed displaying breeding behavior.

Vesper sparrows were observed during 3.1% of surveys and were not recorded in the RSA. However, this species has several recorded mortalities at other WGFs (Kingsley and Whittam 2005). Although not observed in the RSA during surveys, this species exhibits aerial courtship displays that would increase the risk of collision with a WTG blade.

Red-naped sapsucker was observed once during migratory passerine surveys (0.6%) and was not observed in the RSA. It is estimated that this species is an uncommon visitor to Spring Valley. In addition, this species has not been an observed mortality at other WGF studies (Kingsley and Whittam 2005).

3.3.4 Gallinaceous Birds

Greater sage-grouse is ranked as a Nevada BLM special-status species, NNHP ranks it as S3S4B (vulnerable to apparently secure but with long-term concerns, breeding species), and NatureServe gives it a ranking of G4 (long-term concern, although now apparently secure). On March 5, 2010, the USFWS made a decision about the 12-month finding for the greater sage-grouse and acknowledged that while federal protection of this species is warranted, its listing was precluded because more threatened species received listing priority. Therefore, the species will be listed as a candidate species, and its status would be reviewed annually. While this does not offer the greater sage-grouse any additional legal protection, it does require state and federal biologists to monitor populations more closely and federal agencies to be more aware of where potentially disturbing activities are taking place in relation to sage-grouse leks (Tavares 2010). Additionally, on March 5, 2010, the BLM Washington Office issued IM 2010-071, Gunnison and Greater Sage-Grouse Management Considerations for Energy Development. The IM identifies management actions necessary to ensure environmentally responsible exploration, authorization, leasing, and development of renewable energy resources within the range of the greater sage-grouse.

Greater sage-grouse are sagebrush obligates that depend on sagebrush habitats for successful reproduction and winter survival (Connelly et al. 2004). Based on Southwest Regional Gap Analysis Project (SWReGAP) data for sagebrush vegetation (USGS 2004), there are 174,141 acres of habitat within the Spring Valley Watershed, of which 3,643 acres are within the project area for the Proposed Action. Additionally, GIS data provided by NDOW for the RMP/FEIS show the project area as summer and winter habitat (BLM 2005); however, those data are recorded at a course scale and it is assumed that habitat is limited primarily to the 3,643 acres of sagebrush. Further, the project area sits between U.S. Route 6/50 on the east and south and County Highway 893 on the west. Both highways are paralleled by transmission lines. Within the project area, multiple dirt roads traverse the area and a series of transmission lines, including the 230-kV line that the project would tie into, bisects the project area. The presence of roads and transmission lines reduce the quality of habitat within the project area. Consistent with that conclusion, the Environmental Screening Analysis for this project identified the highest-quality habitat in this portion of Spring Valley as habitat along the bench areas west of SR 893 (Estep Environmental 2007). A detailed discussion of greater sage-grouse habitat and life history can be found in the Spring Valley Wind Biological Resources Report (SWCA 2009b).

Greater sage-grouse telemetry data were collected by SNWA between 2008 and 2010 as part of a collaborative NDOW-BLM-Great Basin Bird Observatory-SNWA effort. Of all collared birds in the SNWA telemetry data set, male 316B and female 276A had the closest documented observations to the Spring Valley Wind project area. Male 316B was collared on May 7, 2008 and tracked until January 29, 2009, and female 276A was collared on April 2, 2008 and tracked until June 24, 2009.

Both birds showed cross-valley movements between the eastern locations and the western locations in the general region of the proposed SVWEF. Male 316B was documented in three locations: 1) approximately 5 miles north of the project area on and near the Cleve Creek lek, 2) approximately 5 to 6 miles northwest of the project area, and 3) approximately 10 to 15 miles north of the project area. Female 276A was documented in three locations: 1) approximately 2 miles southeast of the project area, 2) approximately 5 miles north of the project area near Cleve Creek lek, and 3) approximately 10 miles north of the project area. All of these locations correspond to the benches along either side of the valley.

Uncollared birds were also observed with collard birds, except when female 276A was observed at the location 2 miles southeast of the project area. No collared birds were recorded in the project area nor were any uncollared sage-grouse recorded based on the dataset provided by SNWA. However, the cross-valley movements suggest that individuals may pass through the area. These data support that while there is potentially available habitat in the middle of the valley, the higher quality sage-grouse habitat is found along the benches and the majority of nearby sage-grouse activity is found to occur at least 4 to 5 miles from the project area.

Data provided by NDOW on greater sage-grouse indicate that the lek system in Spring Valley consists of 38 leks with a combined breeding count estimate of 256 birds, most situated north of the project area. The RMP/FEIS data on greater sage-grouse indicate that three lek sites have been identified within 1 mile of the western and eastern project area boundaries. The Bastian Creek lek is known to be active and is located approximately 8,202 feet from the western project area boundary on the west side of SR 893. NDOW data for this lek indicate that it is regularly used and has averaged three birds per year for the past 10 years. The Cooper Canyon lek site is located to the south of the Bastian Creek lek, approximately 5,900 feet from the western project area boundary, on the west side of SR 893. RMP/FEIS data for this lek shows that it was last active in 1983 and no activity was observed in surveys conducted in 2003. Additionally, SNWA did not record any birds at this lek during their recent telemetry study. The Osceola lek site is located approximately 5,900 feet from the eastern project area boundary, within the U.S. Route 6/50 ROW. The activity of this site is listed as unknown, and the last lek surveys were done in 1955. Again, SNWA did not record any birds at this lek during its recent telemetry study. At this time, it is assumed that both the Cooper Canyon and Osceola leks are inactive. Two additional leks are located approximately 5 miles north of the project area. These include the Cleve Creek lek and a satellite of this lek, named Cleve Creek South. NDOW data for these leks show that Cleve Creek has averaged 23 birds per year for the past 10 years, while Cleve Creek South averaged three birds per year for the past 10 years. No active or inactive leks occur in the project area, and no individuals were observed during preconstruction avian surveys (SWCA 2009a). Based on the recorded greater sage-grouse activity, the project area is situated in a lower use area for sage-grouse than other parts of Spring Valley.

3.3.5 Birds of Prey and Vultures

In total, 21 birds of prey and vultures were identified in the project area. Bird of prey and vulture observations occurred over the course of two years of spring and fall raptor migration surveys, which included more than 210 hours of survey (SWCA 2009a). Additionally, all birds of prey and raptors observed during general use bird surveys were also recorded. Included in these 21 bird of prey and vulture species are eight special-status raptors, including golden eagle (*Aquila chrysaetos*), ferruginous hawk (*Buteo regalis*), Swainson's hawk (*Buteo swainsoni*), prairie falcon (*Falco mexicanus*), northern harrier

(*Circus cyaneus*), bald eagle (*Haliaeetus leucocephalus*), long-eared owl (*Asio otus*), and western burrowing owl (*Athene cunicularia hypugaea*).

Although golden eagles were not observed nesting in the project area or during breeding bird count surveys, they were commonly observed flying overhead by biologists when traveling throughout the project area. During surveys, this species was recorded during 19.4% of raptor migration surveys and 8.1% of passerine surveys. This species was observed in the RSA, constituting 30.8% of the species' observations during passerine surveys and 50.0% of the species' observations during raptor migration surveys. Golden eagles are sensitive to disturbance, particularly while nesting, and will abandon the nest if provoked (Tesky 1994). While golden eagles will nest on tall, artificial structures, such as electrical poles and towers, they prefer to nest on cliff ledges in rocky canyons or even in large trees, neither of which are present in the project area. Furthermore, no nesting golden eagles were observed during two years of helicopter raptor nest surveys or breeding bird point-counts for the project (SWCA 2009a). It is believed that the closest nesting golden eagles probably occur in the Schell Creek and Snake ranges west and east of the project area, respectively (Floyd et al. 2007).

Raptor nest searches during 2007 and 2008 found 25 raptor or common raven nests during helicopter surveys of the project area. Ferruginous hawk and Swainson's hawk were the only identified raptor species nesting during these surveys. The nearest ferruginous hawk nest is approximately 1.3 miles northeast of the project area boundary, and the nearest Swainson's hawk nest is in the very northeast corner of the project area boundary. Both of these nests were recorded as inactive. The nearest active ferruginous and Swainson's hawk nests are approximately 2.1 and 0.75 mile away, respectively. Both Swainson's hawk and ferruginous hawk are described as displaying nesting site tenacity (Ehrlich et al. 1988). The evidence of multiple nests in the area indicates that it may be an important reproduction site for these raptors. In addition, Swainson's hawk activity is of particular interest, as these are uncommon nesters in Nevada; only five territories with active Swainson's hawk nests were recorded during HWI 2005 nest surveys in northeastern Nevada. The observation of three active nests in Spring Valley seems to indicate a relatively high concentration of this species in or near the project area.

Ferruginous hawks were not observed within the RSA during migration surveys; however, this species was observed within the RSA during passerine surveys.

During raptor migration surveys, ferruginous hawks were observed on 16.7% of surveys and constituted only 1.3% of observations during passerine surveys. This species was not observed in the RSA during raptor migration and was observed within the RSA once during migratory passerine surveys. Ferruginous hawks were also observed during breeding bird point-counts. Ferruginous hawks have had several recorded mortalities at other WGFs (Kingsley and Whittam 2005).

Swainson's hawk was fairly frequently observed during raptor migration surveys (13.9%), and 22.2% of these observations were within the RSA. Swainson's hawks were observed during 9.4% of passerine surveys and were also observed during breeding bird point-counts. Records indicate nine recorded fatalities at three other WGF studies: seven of these were juveniles recorded at McBride Lake, one fatality occurred at APWRA, and the other was at Stateline, Washington (Kingsley and Whittam 2005). Swainson's hawks have been recorded as a relatively commonly observed species, with few to no recorded fatalities in other WGF studies (Brown and Hamilton 2004; Erickson et al. 2002; Kingsley and Whittam 2005). All of these carcasses were young-of-year or juveniles. This could possibly indicate that the inexperience of juveniles could increase the risk of collision with a WTG blade for this specific age group (Brown and Hamilton 2004). Considering all of these factors, Swainson's hawk has a higher risk of mortality than other raptor species in the SVWEF.

Prairie falcons were observed during 13.9% of raptor migration surveys, including in the RSA, and were also observed twice during passerine surveys (0.04%), although they were not flying within the RSA

during those observations. Prairie falcons have had several recorded mortalities at other WGFs (Kingsley and Whittam 2005), although overall mortality of large falcons has been low at newer-generation wind plants, and only one prairie falcon mortality was observed at Foote Creek Rim, which estimates one prairie falcon mortality per year for every 200 turbines at the site (Erickson et al. 2002).

Northern harriers were observed during 25.0% of raptor migration surveys and 15.0% of migratory passerine surveys. Harriers were observed in the RSA during 40.0% of observations for raptor migration surveys, but only constituted 3.4% of observations during passerine surveys. Northern harriers have been recorded fatalities at other WGFs (Kingsley and Whittam 2005), although northern harriers have few documented mortalities, even in areas with relatively high northern harrier use (Erikson et al. 2002). This could indicate that this species is able to avoid impacts with WTG blades.

A bald eagle was observed once during fall raptor migration surveys (2.8%) and was not using the RSA during this observation. This species was noted incidentally while traveling through the project area on a few occasions, but its presence in the project area is thought to be uncommon. This species may use the project area during the winter but is not a breeding summer resident. There has never been a bald eagle mortality reported at a WGF as of 2005 (Kingsley and Whittam 2005).

Although the long-eared owl was not observed during avian surveys, biologists saw and heard this species while camping and traveling within the project area. One long-eared owl fatality has been recorded from the Tehachapi Pass Wind Resource Area in California (Anderson et al. 2004; Kingsley and Whittam 2005). However, as of 2005, no fatalities of this species have been recorded from WGFs outside California. Still, limited information exists on nocturnal avian species; therefore, little is known of the disturbance impacts and how owl species react to turbines (Kingsley and Whittam 2005). Although not observed on surveys, the peregrine falcon (*Falco peregrinus*), a BLM special-status species, has been recorded in Spring Valley and would be expected to be a rare visitor to the area.

A pair of western burrowing owls was also incidentally observed while biologists were traveling in the project area. This pair was observed at a burrow system in the original project area, approximately 4 miles north of the current project boundary. Although there have been burrowing owl fatalities at WGFs in California, none have been reported from other WGFs. Again, little is known of the disturbance impacts and how owl species react to turbines (Kingsley and Whittam 2005).

3.3.6 Bats

Four species of special-status bats have been documented in the project area (SWCA 2009a) and include pallid bat, Townsend's big-eared bat, western red bat, and Brazilian free-tailed bat. These species accounted for approximately 12.7% of all acoustic survey data (Figure 3.3-1). Brazilian free-tailed bats accounted for far more activity relative to the other species; however, acoustic surveys have inherent bias and tend to underestimate the activity of "quiet" bat species such as Townsend's big-eared bat and pallid bat (O'Farrell and Gannon 1999). All four species were detected within the RSA (SWCA 2009a).

Of the special-status bats, the most well known is probably the Brazilian free-tailed bat because of the proximity of the project area to the Rose Guano Cave, which is located approximately 4 miles to the east of the nearest proposed WTG. Rose Guano Cave serves as a migratory stopover for over 1 million individual Brazilian free-tailed bats during fall migration (Sherwin 2009). Preliminary data suggest that bats only remain at the cave for an average of four days before leaving the local area (Sherwin 2009). Preliminary radar data show that bats exit Rose Guano Cave from 1900 to 2130 hours, with the bulk of the exit occurring between 2000 to 2130 hours (Sherwin 2009). Upon exiting Rose Guano Cave, the plume of bats gained altitude to reach approximately 1,200 feet above the valley floor before turning south through the valley (Sherwin 2009). While some portion of the plume dropped to forage in the valley, preliminary data indicate that the majority of bats are traveling to agricultural fields south of the

project area for foraging (Sherwin 2009). Although the majority of individuals continue south, the large population of Brazilian free-tailed bats means that a large number of individuals relative to other bat species, but a small percentage of the overall population, may enter the project area. No roosting habitat for this species occurs within the project area. This species is known for its ability to fly up to 50 miles to foraging grounds (NatureServe 2008), sometimes foraging at heights up to 2,400 feet above ground level (McCracken 1996). Additionally, this species has been a reported mortality at other wind energy facilities (Kerlinger et al. 2006; Piorkowski 2006). Survey data indicate that this species accounted for approximately 11% of all preconstruction survey data and was the most common migratory species observed in the project area (SWCA 2009a).

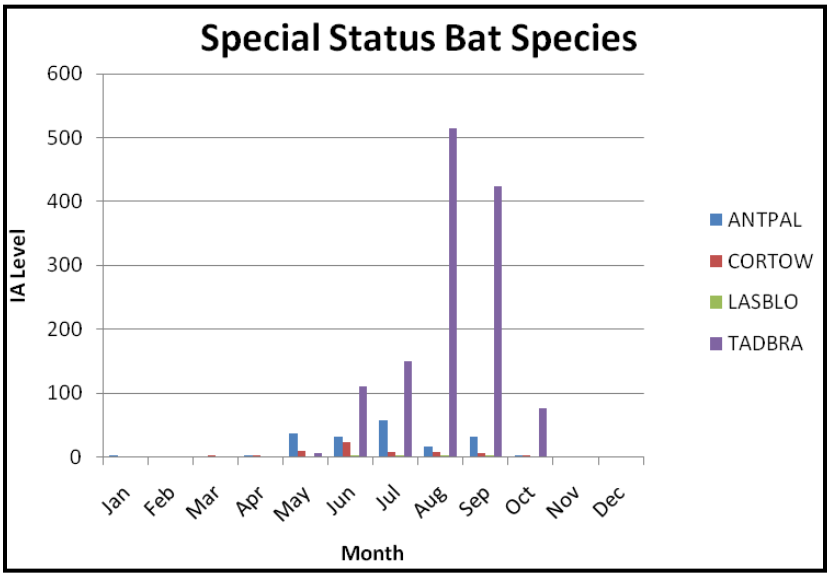

Figure 3.3-1. Special-status bat species, 2007–2008.

Western red bat was a rare occurrence on-site, constituting less than 0.1% of all preconstruction bat survey data (SWCA 2009a). This species is extremely rare in the State of Nevada; observations of this species indicate that it is limited to three counties in Nevada (Bradley et al. 2006). Little is known about the resident and winter status of the western red bat in Nevada, although it is assumed that this species is migratory (Bradley et al. 2006). The western red bat is a tree-roosting species, and potential roosting habitat on or near the site is extremely limited. This species has been reported as a mortality at other wind energy facilities in the western United States (Arnett et al. 2009; BLM 2005).

Pallid bat constituted approximately 1.2% of all preconstruction survey data (SWCA 2009a). Pallid bats are found throughout the State of Nevada and are year-round residents (Bradley et al. 2006). This species often selects caves or mines as roosting locations, although they will use a variety of locations, such as hollow trees, rock crevices, buildings, and bridges (Bradley et al. 2006). Roost habitat for this species is extremely limited in and near the project site. The pallid bat has not been a reported mortality at any wind energy facilities in the current literature (Arnett et al. 2008; BLM 2005).

Townsend's big-eared bats accounted approximately 0.4% of all preconstruction survey data (SWCA 2009a). This species is found throughout Nevada, although their distribution correlates with the availability of caves and mines (Bradley et al. 2006). Despite their wide distribution, Townsend's big-eared bat populations are reported to be in serious decline in the western United States (Bradley et al. 2006). This species is generally associated with caves and mines, although they will use suitably cave-like buildings and trees if available. Potential roosting habitat is extremely limited on-site, but caves and

inactive mines do occur within the Snake and Schell Creek ranges adjacent to the project area, of which at least some are known to host maternity colonies. One of the largest roosts for this species (2,500 to 3,000 individuals) is approximately 15 miles north in the Piermont Canyon (personal communication, Jason Williams, NDOW, to Wells McGiffert, BLM 2008). Townsend's big-eared bat has not been a reported mortality at any wind energy facility in the current literature (Arnett et al. 2008; BLM 2005).

3.3.7 Vegetation

Based on GIS data available through the NNHP, Parish phacelia (*Phacelia parishii*) is the only federally or state-protected plant species known to occur within or near the project area. This species is known from 16 occurrences in Nevada, and the total population (occurring in Nevada and Utah) is estimated to be 37 million individuals and declining (NNHP 2001). Within Spring Valley, four populations of Parish phacelia have been recorded to the north and south of the project area (NNHP 2001).

No species-specific surveys were conducted for this plant; however, suitable habitat for this low-growing annual phacelia is present and is described as "salt-crusted silty-clay soils on valley bottoms, lake deposits, and playa edges . . . surrounded by saltbush scrub vegetation" (NNHP 2001). Although approximately 57% of the project area is composed of salt desert shrub vegetation (USGS 2004), no occurrences of salt desert shrub were observed to occur around playas or areas with standing water where the species typically occurs. Based on these observations, suitable habitat for Parish phacelia may occur in the project area but is very limited.

3.4 Grazing

Livestock grazing and production is the dominant land use in and around the project area (Estep Environmental 2007). Spring Valley has primarily been used as rangeland, both historically and currently, for cattle and sheep grazing. Rangelands are divided into allotments for management purposes. The proposed project area overlaps two existing grazing allotments, Majors and Bastian Creek. Grazing use for both of these allotments is managed in accordance with the *Fundamentals of Rangeland Health and Standards and Guidelines for Grazing for Nevada's Northeastern Great Basin Area* (43 CFR 4180, Appendix C:Northeastern RAC Standards and Guidelines).

The Majors Allotment (Allotment No. 10126) totals 104,861 acres. This allotment contains 99,193 acres of BLM land and 5,668 acres of private land (BLM 2009a). There are 12,535 permitted and active use animal unit months (AUMs) on this allotment, which is grazed by both cattle and sheep (BLM 2009a). Approximately 2,552 acres (less than 3%) of the Majors Allotment occurs in the western portion of the project area. Forage within this area includes Inter-Mountain Basin big sagebrush shrubland (98.6 acres) and Great Basin Xeric mixed sagebrush shrubland (484.6 acres), which make up 22.8% of the allotment within the project area. The remaining vegetation is Great Basin Pinyon-Juniper Woodland (1.8 acres), Inter-Mountain Basin Greasewood Flat (5.0 acres), and Inter-Mountain Basins mixed salt desert scrub (1,962.1 acres).

The Bastian Creek Allotment (Allotment No. 10121) totals 13,527 acres on public land (BLM 2009a). There are 1,778 permitted and active AUMs within this allotment, which is grazed by cattle (BLM 2009a). Approximately 6,012 acres, or 44% of the allotment, occurs within the eastern portion of the project area. Forage within this area includes Inter-Mountain Basin big sagebrush shrubland (2,628.6 acres) and Great Basin Xeric mixed sagebrush shrubland (431.3 acres), which make up 50.9% of the allotment within the project area. The remaining vegetation is Great Basin Pinyon-Juniper Woodland (6.0 acres), Inter-Mountain Basin Greasewood Flat (12.5 acres), and Inter-Mountain Basin mixed salt desert scrub (2,934.0 acres). A 575.9-acre vegetation treatment area developed to provide better forage is also present within this allotment.

3.5 Water Resources

3.5.1 Surface Water

The project area is located within the Spring Valley Hydrographic Area (Hydrographic Area 184). Surface water in Spring Valley consists of springs and creeks. Groundwater discharges to the surface at several springs in the Schell Creek Range, Snake Range, and on the valley bottom and is an important source of surface water for the region. Although there are many springs within the hydrographic area, only two springs occur within the project area, both in the northern portion (Kleinfelder 2010). Creeks in the hydrographic area generally emanate from springs in the Schell Creek and Snake ranges. The sources of most creeks in Spring Valley occur in the Schell Creek Range on the northwest side of the valley (SNWA 2008). Spring Creek, which is fed intermittently by a spring located approximately 4 miles south of the project area, passes through a small section of the eastern portion of the project area. Additionally, Cooper Canyon Wash, an ephemeral wash, passes through the southwest portion of the project area and terminates approximately 0.2 mile south of the project area boundary. Other creeks in the vicinity of the project area include Cleve Creek, the largest creek in Spring Valley, which is diverted for agricultural uses at the Cleveland Ranch, and Bastian Creek, which is diverted to the Bastian Creek Ranch (Kleinfelder 2010).

3.5.2 Groundwater

Groundwater resources within Spring Valley are stored within two aquifers: a basin-fill aquifer, which consists of alluvial deposits within the Spring Valley basin, and a deeper carbonate rock aquifer. Groundwater in the basin-fill aquifer occurs at shallow depths throughout Spring Valley. Based on groundwater boring data, 50% of the borings showed depth to groundwater within the project area ranges from approximately 14.5 to 40.5 feet below ground surface. The remaining 50% of the borings did not encounter groundwater until 50 feet (Kleinfelder 2010). The carbonate rock aquifer underlies the basin-fill aquifer.

Groundwater within the basin-fill aquifer is recharged by snowmelt and precipitation primarily occurring in the Schell Creek and Snake Mountain ranges to the west and east of the project area. Groundwater in Spring Valley is pumped and used for irrigation. The total amount of groundwater recharge is estimated to be between 75,000 and 93,000 acre-feet per year (AFY). Groundwater within the basin-fill aquifer discharges to the surface at several springs within Spring Valley and the ranges. The total amount of groundwater discharge is estimated to be between 70,000 to 76,000 AFY.

The project area is located within a groundwater discharge area. Based on the hydrogeology study (Kleinfelder 2010), recharge of the basin aquifer occurs on the basin margins and the project area is in an area of net discharge primarily through evapo-transpiration. Groundwater discharge in the project area flows north to an unnamed playa 13 miles north of the project area. Groundwater under the project area flows north and east toward South Bastian Spring (Kleinfelder 2010).

3.6 Cultural Resources

Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended, requires federal agencies to take into account the effects of their actions on properties listed or eligible for listing in the National Register of Historic Places (NRHP). As part of the SVWEF EA, SWCA conducted extensive work on behalf of BLM to identify and evaluate cultural resources. The methods used during the identification efforts and the area of potential effect (APE) surveyed were established in accordance with the regulations set forth in 36 CFR 800. These regulations guide implementation of the NHPA. Identified cultural resources were then analyzed using the criteria in 36 CFR 60.4 to assess whether the cultural

resources were eligible for the NRHP. This documentation satisfied the identification phase of Section 106 of the NHPA and its implementing regulations at 36 CFR 800.

3.6.1 Regulatory Framework

Cultural resources that meet the eligibility criteria for listing on the NRHP are considered "significant" resources and must be taken into consideration during the planning of federal projects. Federal agencies are also required to consider the effects of their actions on sites, areas, and other resources (e.g., plants) that are of religious significance to Native Americans, as established under the American Indian Religious Freedom Act (AIRFA) (PL 95-341). Native American graves and burial grounds are protected by the Native American Graves Protection and Repatriation Act (NAGPRA) (PL 101-601).

The NHPA is the overarching law concerning the management of cultural resources. Numerous other regulatory requirements, however, pertain to cultural properties and are presented below. These laws are applicable to any project undertaken on federal land or requiring federal permitting or funding. The NHPA created the framework within which cultural resources are managed in the United States. Section 106 of the NHPA, defines the process for the identification of a cultural resource and the process for determining whether a project will adversely affect the resource.

3.6.1.1 LAW OR ORDER NAME AND INTENT OF LAW OR ORDER

- Antiquities Act of 1906 as amended—This law makes it illegal to remove cultural resources from federal land without permission. It also allows the President to establish historical monuments and landmarks.
- EO 11593, Protection and Enhancement of the Cultural Environment (1971)—EO 11593 requires federal agencies to inventory their cultural resources and to record, to professional standards, any cultural resource that may be altered or destroyed.
- Archaeological and Historic Preservation Act (1974) as amended (AHPA)—The AHPA directly addresses impacts to cultural resources resulting from federal activities that would significantly alter the landscape. The focus of the law is the creation of dams and the impacts resulting from flooding, worker housing, creation of access roads, etc.; however, its requirements are applicable to any federal action.
- Archaeological Resources Protection Act of 1979 as amended (ARPA)—The ARPA established civil and criminal penalties for the destruction or alteration of cultural resources and established professional standards for excavation.
- AIRFA of 1978—The AIRFA protects the right of Native Americans to have access to their sacred places. It requires consultation with Native American organizations if an agency action will affect a sacred site on federal lands.
- NAGPRA of 1990 as amended—NAGPRA requires federal agencies to consult with the appropriate Native American tribes prior to the intentional excavation of human remains and funerary objects. It requires the repatriation of human remains found on the agencies' land.
- EO 13007, Indian Sacred Sites (1996)—EO 13007 requires that an agency allow Native Americans to worship at sacred sites located on federal property.
- EO 13175, Consultation and Coordination with Indian Tribal Governments (2000)—EO 13175 requires federal agencies to coordinate and consult with Indian tribal governments whose interests might be directly and substantially affected by activities on federally administered lands.

3.6.2 NRHP Criteria for Evaluation

For purposes of this process, a "Significant Cultural Resource" protected by NHPA is generally 50 years of age or older (with a few special exceptions), retains a certain amount of physical integrity, and meets NRHP criteria for evaluation (36 CFR 60.4) which state, in part,

> The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, materials, workmanship, feeling, and association, and
>
> Criterion A. that are associated with events that have made a significant contribution to the broad patterns of our history; or
>
> Criterion B. that are associated with the lives of persons significant in our past; or
>
> Criterion C. that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
>
> Criterion D. that have yielded, or may be likely to yield, information important in prehistory or history.

While historic period sites may be determined NRHP eligible under virtually any of these criteria, prehistoric archaeological sites are almost always evaluated with respect to Criterion D. In other words, to be considered NRHP eligible, a prehistoric site must have yielded, or have the potential to yield, important information about some aspect of prehistory or history, including events, processes, institutions, design, construction, settlement, migration, ideals, beliefs, lifeways, and other facets of the development or maintenance of cultural systems. Any consideration of a property's eligibility under Criterion D must address 1) whether the property may provide information to contribute to our understanding and knowledge of history or prehistory, and 2) whether that information is important.

3.6.3 Overview of the Prehistory and History of the Area

Spring Valley is located in the eastern Great Basin (Aikens and Madsen 1986). Evidence of prehistoric human occupation in this region dates from the terminal Pleistocene era to the period of Euro-American exploration and settlement. Important sources on eastern Great Basin prehistory include Aikens and Madsen (1986) and Madsen et al. (2005), as well as works on the Great Basin as a whole (e.g., Beck and Jones 1997; Grayson 1993; Kelly 1997; Madsen and Simms 1998). A summary of current knowledge about the prehistory of Spring Valley and the surrounding region can be found in the archaeological inventory report on file with the BLM Ely District (SWCA 2009d).

Spring Valley falls within the ethnographic aboriginal territory of the Western Shoshone as reported by d'Azevedo (1986:ix). It appears to fall outside the "Aboriginal Western Shoshone Territory" defined by Crum (1994:3), although Crum does discuss the Ely, Steptoe, and Spring Valley areas in his history of the Western Shoshone.

In 1860, the Pony Express, the Telegraph, and the Overland Stage brought explorers and prospectors into the western United States; for the next 40 years, discoveries of minerals such as gold, silver, and lead created many small boomtowns such as Hamilton and the Osceola Mining District. Then, in 1906, with the arrival of the Nevada Northern Railway, the economy of Ely, McGill, Ruth, and many other towns of the copper period flourished.

3.6.4 Identification of Cultural Resources

Spring Valley contains a rich history that goes back over 8,000 years. The historic period (the last 200 years) of the valley includes the Pony Express, mining, ranching, Native American villages, and Euro-American and Native American interactions. During the prehistoric period (prior to the arrival of Euro-Americans) the valley was utilized by the Native Americans for hunting and gathering of food and other resources. The Native Americans lived in small winter villages and in family groups throughout the valley.

Section 106 of the NHPA, as amended, requires the BLM to conduct cultural resource inventories to ascertain the existence of cultural resources within the area of potential effect (APE) for the project area. Cultural resources may include archeological sites, historic buildings and structures, and places important to modern groups such as Native American tribes. The BLM then takes into account the effects of the proposed project on properties listed or eligible for listing in the NRHP. The BLM then determines if the sites will be avoided or mitigated.

A Class III cultural resource inventory (pedestrian surveys for archeological sites) was conducted for the SVWEF. The area inventoried was defined by a perimeter encompassing the entire project and the area contained within. This included areas that would not be directly impacted by SVWEF. The results of the inventory were used to refine the tower, road and ancillary building locations to avoid all known eligible sites for NRHP cultural resources. Identification of the cultural resources within the SVWEF study area was conducted in 2009 by SWCA for the entire project area as initially defined (Villagran et al. 2009).

The Class III inventory, tribal consultation and an ethnographic study of the area revealed concerns and interests of the Native Americans regarding the area of Spring Valley where the proposed SVWEF is to be located. As a result of these concerns and interests, cultural resource monitors would be present during all ground-disturbing activities. If any discoveries are made as a result of the ground-disturbing activities, work would stop immediately and the BLM cultural resource specialist assigned to the project would be notified. The BLM would then take the appropriate action regarding the discovery.

An inventory to identify historic sites that may be impacted by visual effects was also conducted. Thirteen properties were identified within the APE; however, only six of those properties were within view of the facility and access was granted to.

In addition to the cultural resource sites that have been identified, the Great Basin National Heritage Area encompasses White Pine County, Nevada and Millard County, Utah, and contains a variety of archaeological, historical, cultural, natural, and scenic features that are representative of the Great Basin. This designation does not provide for any authority to regulate land uses, but it does promote heritage tourism and visitation to the representative sites throughout the area.

3.7 Native American Religious Concerns

As part of the SVWE EA, SWCA conducted research on behalf of the BLM to identify and evaluate ethnographic resources. Please refer to the Cultural Resources section above for applicable laws and statutes.

Traditional cultural properties and other areas of concern to Native Americans and other cultural groups can include a wide range of tangible and intangible resources (e.g., archaeological sites, funerary objects, medicinal plants, and sacred landscapes). Government-to-government consultation is the only means of identifying the affected environment for a particular site-specific project. It is difficult, if not impossible, to place boundaries on locations of traditional significance. Where boundaries have been defined, tribal

members may not be willing to disclose such information for a variety of reasons. Cultural sensitivity to the need to protect important places is required. Types of valued traditional resources may include, but are not limited to, archaeological sites, burial sites, traditional harvest areas, trails, certain prominent geological features that may have spiritual significance (i.e., sacred landscapes), and viewsheds of sacred locations.

The NHPA establishes the processes for consultation among interested parties, the agency conducting the undertaking, and the State Historic Preservation Officer (SHPO), and for government-to-government consultation between U.S. government agencies and Native American tribal governments.

3.7.1 Overview of Ethnographic History of the Area

A short context is provided in Section 3.6.3 above. In 1938, Steward reported 16 villages in Spring Valley, including one directly northwest of the project area. During the late nineteenth century, several massacres of Native Americans occurred near this area. Traditional plant collecting areas and fandango locations are reported to be nearby (SWCA 2009c).

The Swamp Cedar ACEC has been the site of numerous historical uses. This ACEC is situated directly east and northeast of the proposed SVWEF. Shoshone families once inhabited the area, prior to a massacre by U.S. soldiers, which occurred after conflicts arose between white settlers, Bannock Shoshone, and Ute (BLM 2007:Appendix Q). While the exact location is unknown, this altercation, referred to as the Goshute War of 1863, was known to take place within or in the vicinity of the Swamp Cedar ACEC (BLM 2007:Appendix Q). This massacre resulted in the death of 23 Goshute, and injury to one soldier and horse (BLM 2007:Appendix Q). Additionally, several prehistoric sites have been recorded in the Swamp Cedar ACEC (BLM 2007:Appendix Q).

3.7.2 Analysis and Methodology

A Class III inventory (Villagran et al. 2009) for cultural resources and an ethnographic context (Lauran et al. 2009) of the project area was conducted by SWCA to determine the nature of site types and distribution. Sensitivity maps were derived from this information and analysis of previously published ethnographic information. These and the data contained in the report can be used to determine possible effects for each of the alternatives.

3.8 Visual Resources

Visual resources (the landscape) consist of landform (topography and soils), vegetation, and human-made structures (roads, buildings, and modifications of the land, vegetation, and water). These elements of the landscape can be described in terms of their form, line, color, and texture. Normally, the more variety of these elements there is in a landscape, the more interesting or scenic the landscape becomes if the elements exist in harmony with each other. The BLM manages landscapes for varying levels of protection and modification, giving consideration to other resource values, land uses, and the scenic quality of the landscape.

The analysis area for visual resources includes lands where potential changes to the landscape from the wind facility may be discerned. A viewshed analysis was conducted using GIS data to assess where the wind facility would be visible in the landscape, and this analysis was verified in the field (SWCA 2009e). The area of analysis for visual resources consists of an 11-mile radius around the project area, which roughly marks the maximum distance away from which an observer could clearly distinguish the WTG structures and associated infrastructure and includes portions of GBNP, the boundary of which is less than 5 miles from the project area.

The BLM uses a VRM system to inventory and manage visual resources on public lands. The primary objective of VRM is to maintain the existing visual quality of BLM-administered public lands and to protect unique and fragile visual resources. The VRM system uses four classes to describe different degrees of modification allowed to the landscape. VRM classes are visual ratings that describe an area in terms of visual or scenic quality and viewer sensitivity to the landscape (the degree of public concern for an area's scenic quality). Once an area has been assigned a VRM class, the management objectives of that class can be used to analyze and determine visual impacts of proposed activities and to gauge the amount of disturbance an area can tolerate before it exceeds the visual management objectives of its VRM class (BLM 1980). VRM class designations are based on the area's visual sensitivity and are the result of a combination of factors, including the degree of visitor interest in and public concern for the area's visual resources, the area's public visibility, the level of use by the public, and the type of visitor use the area receives (BLM 1992). Lands in the project area are designated as VRM Class III and Class IV (BLM 2008b). The Class III management objective "is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention, but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape". The VRM Class IV objective is "to provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high" (BLM 1980).

3.8.1 Landscape Character

The dominant landscape characteristic within and surrounding the proposed project area is typical of the basin and range, with the broad valley floor extending north and south to the horizons flanked by the steep, rugged Schell Creek Range to the west and the Snake Range to the east, defining and containing the views. Vegetation typical of the Great Basin environment occurs throughout the project area. Sagebrush is interspersed with greasewood, shadscale, rabbitbrush, and other shrubs and grasses that contribute to the scenic quality of the area. Naturally exposed white, buff, and tan-colored soils also add scenic contrasts and scenic quality to the area. Additional vegetation consists of the darker green Rocky Mountain juniper or swamp cedar present on the valley floor. The existing landscape has been modified through past and current human habitation, road development, ranching and mining activities, and transmission lines.

The primary views of the Proposed Action would be from two travel routes, U.S. Route 6/50 and SR 893. Many travelers on these routes are on their way to the GBNP and other recreation destinations in eastern Nevada, and have a high expectation of the natural or undeveloped landscapes of the Great Basin. Five Key Observation Points (KOPs) were selected to represent effects of the project as seen from public areas that permit a high degree of visibility of the project area (Figure 3.8-1). KOPs are critical viewpoints of typical landscapes in the project area that were selected to represent the views of disturbances throughout the life of the wind facility, and would be encountered by the greatest number of people.

KOP 1 is located on U.S. Route 6/50 just west of Sacramento Pass. From this location, the view is to the southwest and looks out over the wide open valley floor. Low shrubs and grasses cover the valley floor, interspersed with patches of darker green juniper. The rugged horizon line of the Schell Creek Range occurs in the middle ground and background. This location represents the views of people traveling south and west on U.S. Route 6/50 through Spring Valley. The nearest proposed WTG is located approximately 4.6 miles from the KOP.

KOP 2 is located on U.S. Route 6/50 south of KOP 1. From this location, the view of the project area is to the northwest and looks up the valley floor and the higher peaks of the Schell Creek range. Low shrubs and grasses cover the valley floor. Although the darker green swamp cedars are visible, they occur outside the primary view of the project area. The rugged horizon line of the Schell Creek Range occurs in the background. This location represents the views of people traveling north and east on U.S. Route 6/50 through Spring Valley. The nearest proposed WTG is located approximately 1.3 miles from the KOP.

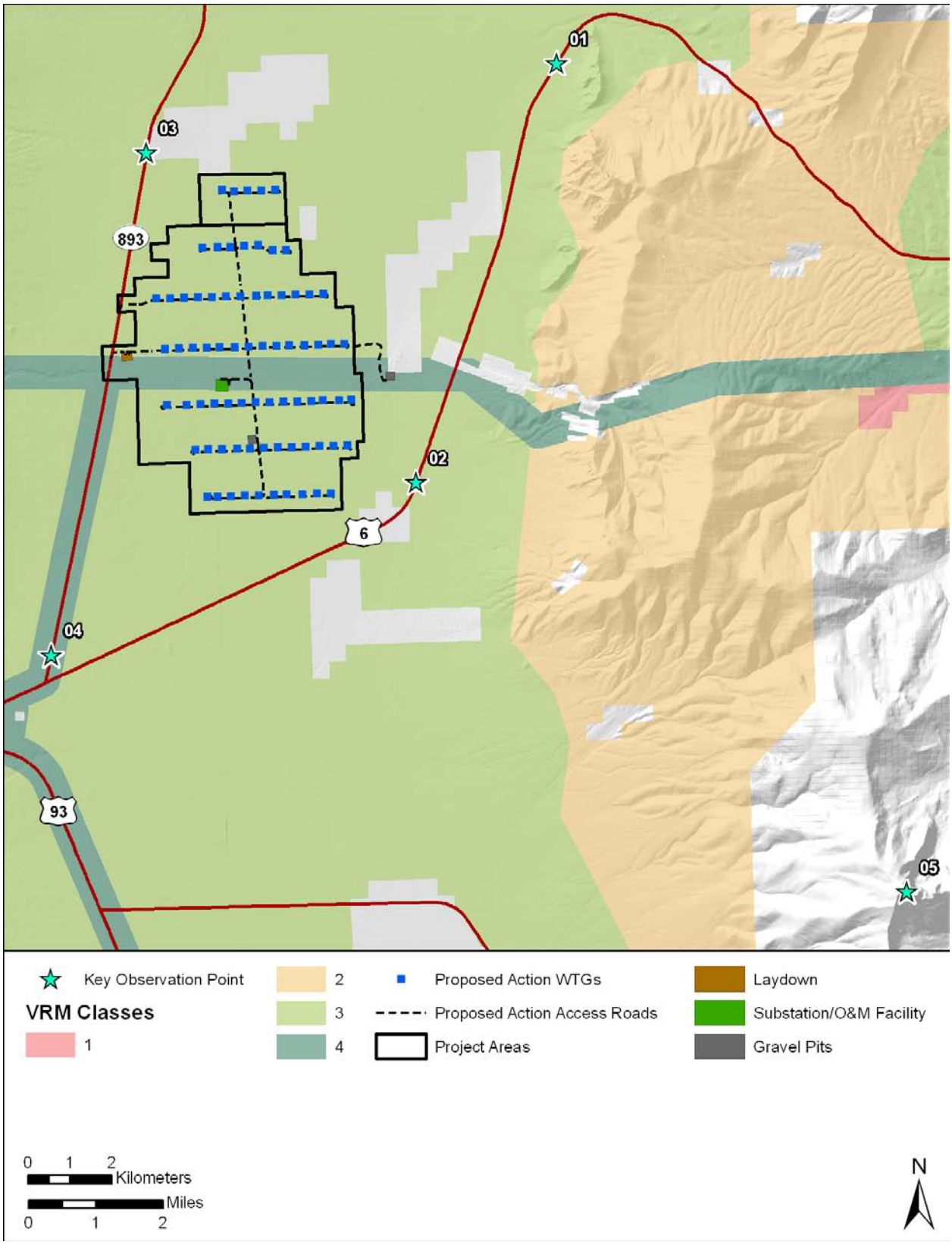

Figure 3.8-1. Key Observation Points.

KOP 3 is located on SR 893, just south of the Bastian Creek Ranch property. From this location, the view is to the southeast and looks out over the wide open valley floor. Low shrubs and grasses cover the valley floor, interspersed with patches of darker green juniper. The rugged horizon line of the Snake Range occurs in the background. This location represents the views from the ranch and of people traveling south on SR 893. The nearest proposed WTG is located approximately 1 mile from the KOP.

KOP 4 is located on SR 893, just south of KOP 3. From this location, the view is to the east and northeast and looks out over the wide open valley floor. Low shrubs and grasses cover the valley floor interspersed with patches of darker green juniper. The rugged horizon line of the Snake Range occurs in the background. This location represents the views of people traveling north on SR 893 and would consist of local residents, hunters, and visitors to Cleve Creek. The nearest proposed WTG is located approximately 3.2 miles from the KOP.

KOP 5 is located approximately 11 miles southeast of the project area at the top of Wheeler Peak in GBNP. GBNP was created by the Great Basin National Park Act of 1986 "in order to preserve for the benefit and inspiration of the people a representative segment of the Great Basin of the Western United States possessing outstanding resources and significant geological and scenic values, there is hereby established the Great Basin National Park." In addition to the outstanding scenery within the GBNP, the views of surrounding lands from GBNP contribute to the park visitors overall sense and understanding of the Great Basin. This KOP represents the views of visitors to the park, primarily those visitors climbing Wheeler Peak. The viewshed of GBNP is a vast area of largely undeveloped lands, almost 200,000 square miles of the Great Basin. Lands surrounding the GBNP are valleys and mountain ranges, including the Mount Moriah Wilderness to the north and the High Schells Wilderness to the west. The rugged horizon lines of those surrounding mountain ranges extend for miles to the north and south. The expansive valley floors are covered in tan, green, and gray grass and shrub lands, interspersed with darker green juniper trees. They are also crisscrossed with lighter toned dirt and paved roads and transmission lines. Visitors to the summit have clear panoramic views of the entire area.

In addition to the five KOPs identified that provide representative views of the SVWEF, other potential viewpoints include the Mount Moriah and High Schells Wilderness Areas managed by the U.S. Forest Service. Although there are areas within both Wilderness Boundaries from which the SVWEF is visible, no KOPs were identified because those areas do not include any trails, routes, or viewpoints. As a result of the intervening topography, neither the Proposed Action nor the Alternate Development Alternative are visible from the summit of Mount Moriah or the North and South Schell Peaks (Figures 3.8-2 and 3.8-3, respectively). Furthermore, PL 109-432, White Pine County Conservation and Recreation Act 2006, Section 325 Adjacent Management (b) states, "Non-wilderness Activities-The Fact that non-wilderness activities or uses can be seen or heard from areas within a wilderness designated under this subtitle shall not preclude the conduct of those activities or uses outside the boundary of the wilderness area."

3.8.2 Nighttime Lighting and Extent of Skyglow

A "natural lightscape" is defined by the National Park Service (NPS) Air Resources Division as "a place or environment characterized by the natural rhythm of sun and moon cycles, clean air, and of dark nights that are unperturbed by artificial lights" (NPS 2007). Dark night skies are a part of the experience and expectation of visitors seeking recreation opportunities at GBNP. GBNP emphasizes the preservation of dark skies and astronomy through its interpretive program and by hosting astronomy educational programs throughout the year.

The area of analysis for nighttime lighting includes surrounding lands that could be affected by changes in artificial lighting occurring from the Proposed Action and alternatives. Because lighting can disperse through the atmosphere and may extend further than 12 miles, the analysis area is larger than that for visual resources and includes GBNP in its entirety.

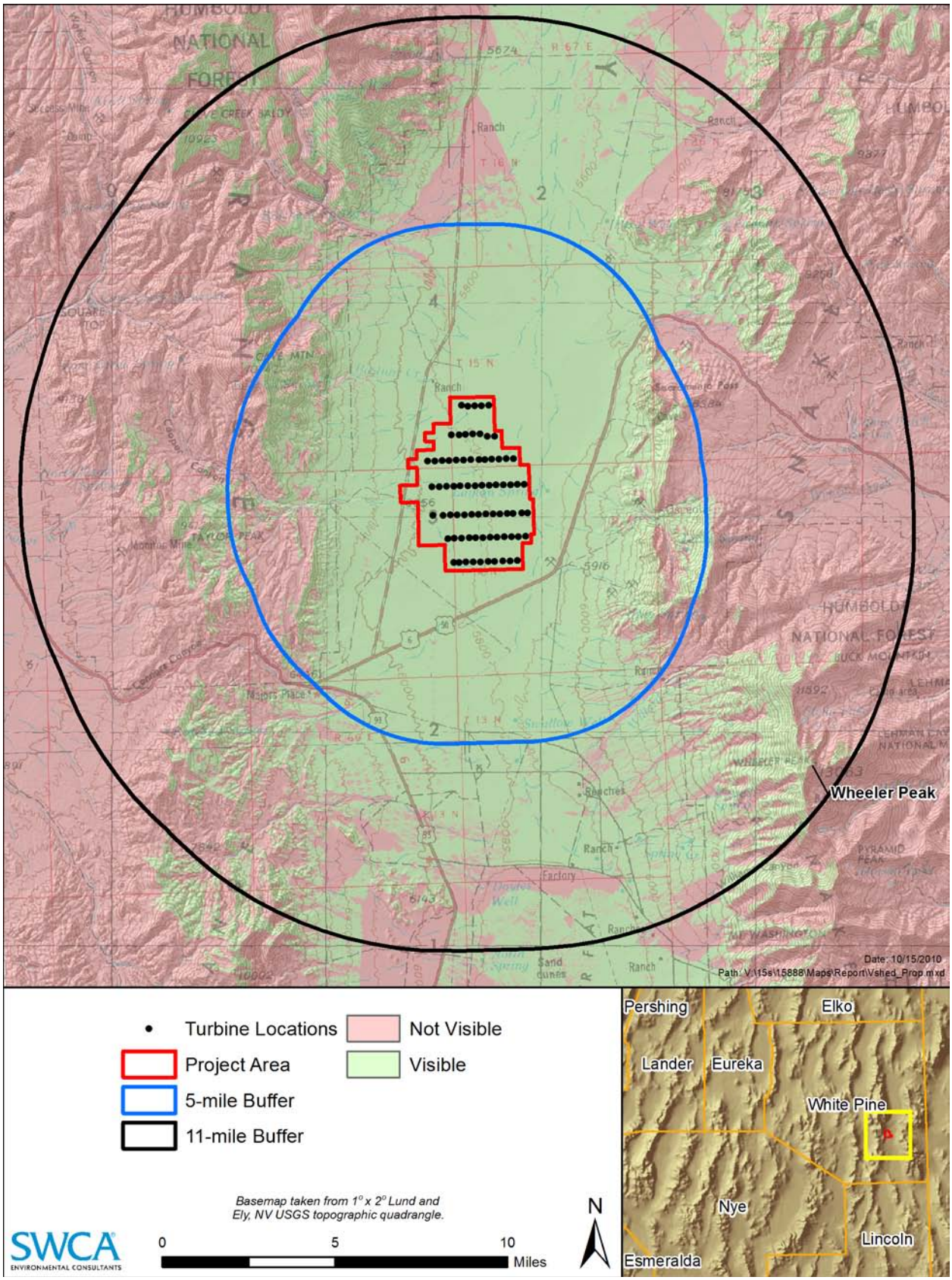

Figure 3.8-2. Viewshed delineation for the Proposed Action.

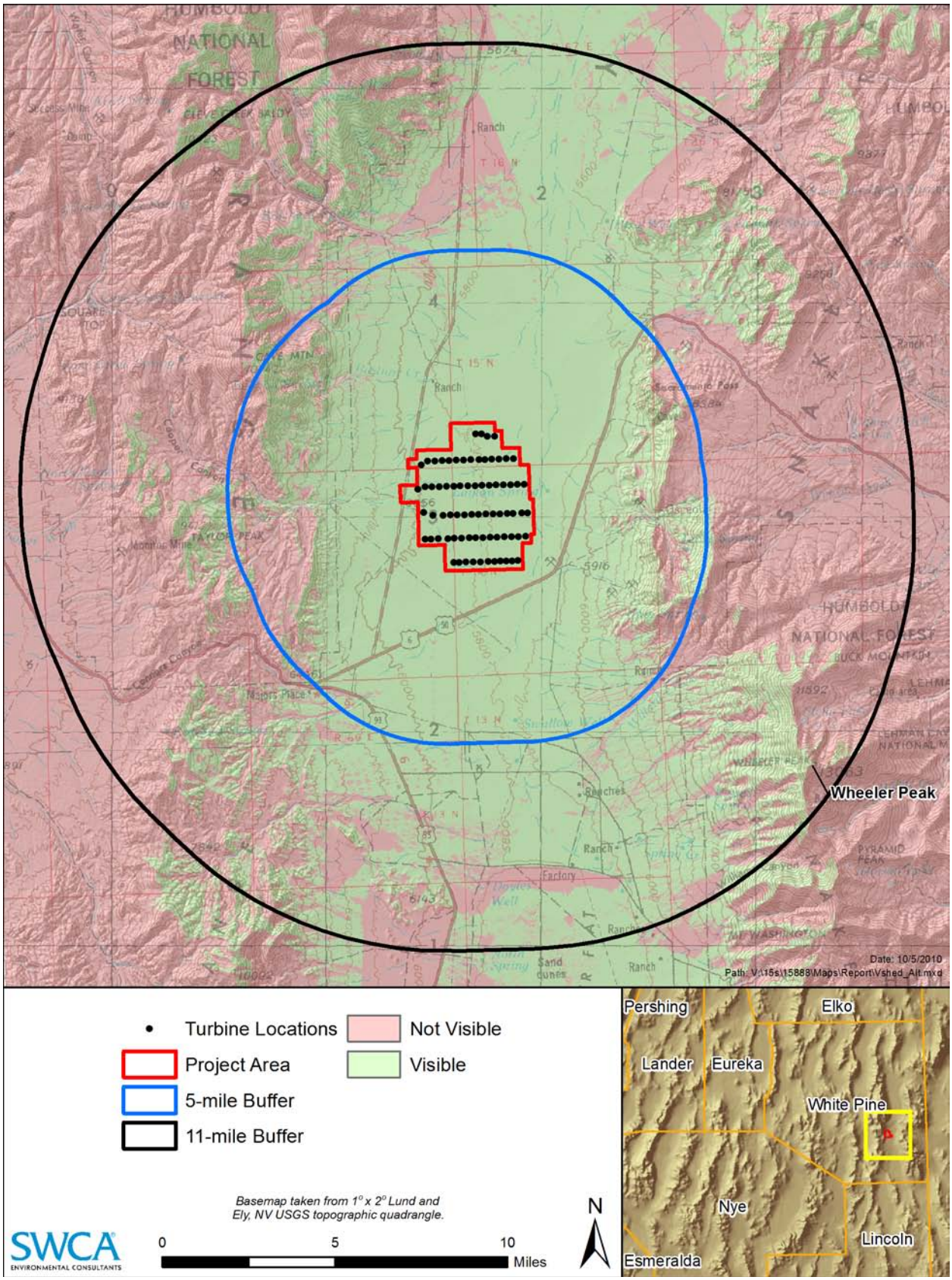

Figure 3.8-3. Viewshed delineation for the Alternative Development Alternative.

Light pollution is defined as the illumination of the night sky caused by artificial light sources (Bortle 2001). Effects of light pollution consist of a decrease in the visibility of stars and other natural night sky features, as well as disruption in natural lightscapes. Light pollution is caused by artificial light sources that are directed upward or sideways. Light then scatters throughout the atmosphere, resulting in skyglow. Other factors that influence skyglow consist of humidity, snow cover, cloud cover, and increased particulate matter in the air. Another form of light pollution is the glare that results from direct lighting. Amateur astronomers are able to qualitatively rank the brightness of the night sky using the Bortle Dark-Sky Scale, a numeric nine-level measure of the night sky brightness at a specific location (Bortle 2001). Under optimal conditions, the project area is assumed to have a Bortle Dark-Sky rating Class 3, equaling that of a typical, rural sky. A Class 3 rating is defined as, some light pollution evident at the horizon; clouds illuminated near horizon, dark overhead; Milky Way still appears complex; M15, M4, M5, M22 distinct naked-eye objects; M33 easily visible with averted vision; zodiacal light striking in spring and autumn, color still visible; nearer surroundings vaguely visible (Bortle 2001). Existing or potential sources of artificial nighttime light in the area include the Bastian Creek Ranch, Majors Junction, Cleve Creek campground, and widely spaced residences of Sacramento Pass and throughout Spring Valley. Ely is the largest source of nighttime light and skyglow in the region and is approximately 20 miles from the project area on the west side of the Schell Creek Range. Other sources of artificial light associated with the town of Baker are approximately 15 miles east of the project area. Because there are so few sources of light pollution, the night skies in the area of analysis and GBNP are some of the darkest skies in the continental United States.

3.9 Noise

The soundscape of an area is made up of both natural and human-created sounds. Sound occurs as a result of vibrations radiating through air, water, or solid objects. This section presents an evaluation of existing ambient noise levels associated with the project area. The area of analysis for noise is largely undeveloped lands managed by the BLM and GBNP. Spring Valley is sparsely populated, with approximately one to two dozen widely separated ranches, residences, and private parcels scattered throughout. The Bastian Creek Ranch is the closest known ranch property to the project area. Additionally, there are private lands within 2 miles of the project area to the south and east. Majors Place, a small business at the junction of U.S. Route 6/50 and 93 is approximately 5 miles southwest of the project area. Cleve Creek, a BLM campground, is 2 miles northwest of the project area. GBNP is approximately 5 miles southeast of the project area.

3.9.1 Fundamentals of Acoustics

Acoustics is the study of sound, and noise is defined as unwanted sound. To assess sound levels and noise impacts, several descriptors and metrics are used by the acoustical industry. Noise is usually defined as unwanted sound because it interferes with speech communication and hearing, or is otherwise annoying. Under certain conditions, noise may cause hearing loss, interfere with human activities at home and work, and in various ways affect people's health and well-being. Noise is measured on a logarithmic scale, expressed in decibels (dB), which is the accepted standard unit for measuring sound pressure amplitude using a manageable range of numbers.

When describing sound and its effect on a human population, A-weighted sound levels (dBA) are typically used to account for or approximate the response of the human ear. The term A-weighted refers to a filtering of the noise signal in a manner that corresponds to the way the human ear perceives sound. The dBA has been found to correlate well with people's judgments of the "noisiness" of different sounds and has been used for many years as a measure of community and industrial noise (Harris 1991).

Given the wide variation in individual thresholds of annoyance, habituation to noise, and situational reactions to noisy environments, there is no common standard for assessing the subjective effects of noise or to measure the corresponding reactions of annoyance and dissatisfaction. Thus, an important way of determining a person's subjective reaction to a new noise is by comparing it with the existing or ambient environment that is familiar to that person. From an objective, measurable viewpoint, however, there are several standardized noise-level metrics that are commonly used for qualitatively assessing a given noise environment or acoustical situation. Common descriptors of environmental noise consist of the equivalent noise level (Leq) and the day-night level (Ldn). Leq is the equivalent single value of sound that includes the same acoustic energy as the actual, varying sound levels in a given period of time (1 hour). Ldn was developed to account for increased human sensitivity to nighttime noise levels and for greater potential annoyance of noise during the nighttime hours. The actual nighttime noise levels are adjusted, based on the premise that both exterior and interior noise levels are generally lower than daytime levels and, therefore, that nighttime noise can be more noticeable than daytime conditions at the same location. Also, since most people sleep at night, there is often increased sensitivity to intrusive noises. The Ldn is the energy-average A-weighted sound level over a 24-hour period, with an added 10-dB adjustment (penalty) for sounds that occur between 10 p.m. and 7 a.m.

3.9.2 Characterization of Background Noise Levels

The PEIS states that determining existing ambiance noise levels is necessary for comparison with future noise. Because the current land uses and their average noise levels are known for Spring Valley, no site-specific noise-level data collection was required. The ambient noise levels in and around the project area are based on typical noise levels associated with the known conditions and current land uses in Spring Valley. Typical sources used for estimating existing noise conditions are based on those common noise levels presented in Table 3.9-1.

Table 3.9-1. Typical Sound Levels Measured in the Environment and Industry

Example Noise Source or Noise Environment	dBA	Subjective Impression
Shotgun (at shooter's ear) or on a carrier flight deck	140	Painfully loud
Civil defense siren (100 feet)	130	
Jet takeoff (200 feet)	120	Threshold of pain
Loud rock music	110	
Pile driver (50 feet)	100	Very loud
Ambulance siren (100 feet) or in a boiler room	90	
Pneumatic drill (50 feet) or in a noisy restaurant	80	
Busy traffic; hair dryer	70	Moderately loud
Normal conversation (5 feet) or in a data processing center	60	
Light traffic (100 feet); rainfall or in a private business office	50	
Bird calls (distant) or in an average living room or library	40	Quiet
Soft whisper (5 feet); rustling leaves or inside a quiet bedroom	30	
In a recording studio	20	
Normal breathing	10	Threshold of hearing

Source: Beranek (1998).

Typical noise sources in and around the project area include light motorized vehicle traffic, ranch machinery, distant aircraft, wildlife sounds, and wind. Because of the limited number of regular noise

sources in and around the project area, the ambient noise levels are assumed to be less than 50 dBA during daytime hours and 30 dBA at during nighttime hours, or about 35 Ldn.

3.9.3 Noise Standards and Guidelines

U.S. Environmental Protection Agency. In 1974, the EPA created guidelines to assist state and local government entities in the development of state and local laws, ordinances, regulations, and standards for noise (EPA 1974). In 1974, the EPA released a document identifying a 24-hour exposure level of 70 Ldn as the level of environmental noise to prevent measurable hearing loss over a lifetime (EPA 1974). The same document identified levels of 55 dB outdoors and 45 dB indoors to prevent annoyance.

Occupational Safety and Health Administration (OSHA). On-site noise levels are regulated by the Occupational Safety and Health Act of 1970 (29 CFR 1910.95). The noise exposure level of workers is limited to 90 dBA, over a time-weighted average (TWA) 8-hour work shift to protect hearing. If there are workers exposed to a TWA 8-hr above 85 dBA (i.e., the OSHA Action Level), then the regulations call for a worker hearing protection program that includes baseline and periodic hearing testing, availability of hearing protection devices, and training in hearing damage prevention.

3.10 Transportation

Numerous roads, tracks, and paths for motorized travel occur within or near the project area. These include SR 893, a north-south-trending, two-lane highway located immediately west of the project area that crosses the project boundary at two locations along the far west end, for a combined approximate length of 0.75 mile. U.S. Route 6/50 is located approximately 0.5 mile to the south and east of the project area, provides access to GBNP, Rose Guano Cave, and Sacramento Pass, and serves as a connector route between the towns of Ely and Baker, Nevada. Additionally, approximately 20 miles of existing roads and tracks are located within the project area boundary. These consist primarily of an unpaved road network associated with an existing transmission line and various unimproved roads and tracks used for ranching and dispersed recreation activities. Average annual daily traffic (AADT) volume within the project vicinity is low (NDOT 2009). An AADT of 40 vehicles was measured along SR 893, 0.2 mile north of U.S. Route 6/50.

3.11 Land Use and Special Designations

3.11.1 Lands and Realty

The entire project area, 8,565 acres, is located on public land administered by the BLM Schell Field Office. The Schell Field Office manages public land in east-central Nevada for multiple use and provides opportunities for utility ROWs, mining, wildlife habitat, grazing, and recreation in addition to other resource values and activities. The primary legal basis for granting a ROW on BLM land is Title V—Rights-of-Way, Section 501 of the Federal Land Policy and Management Act of 1976. FLPMA provides the BLM with authority to grant, issue, or renew ROWs over, upon, under, or through such lands for systems for generation, transmission, and distribution of electric energy, except that the applicant shall also comply with all applicable requirements of the Federal Power Commission under the Federal Power Act of 1935 (49 Stat. 847; 16 USC 791).The regulations establishing procedures for the processing of these leases and permits are found in 43 CFR 2800. In addition, the Ely RMP provides guidance for management of public lands in the Ely District and Schell Field Office. The RMP provides for opportunities for multiple land uses in the project area.

The analysis area for lands and realty consists of the project area and a 2-mile buffer surrounding the project area. The 2-mile buffer ensures that access roads, ROWs, pending ROWs, dispersed land uses, and private lands that would be potentially affected by the construction and operation of the wind energy facility are taken into consideration. The analysis area is primarily undeveloped land and can be characterized as open rangeland interspersed with utilities, roads, communication lines, agricultural uses, and widely dispersed residential uses on private parcels. Private lands are described in Section 3.13 Socioeconomics.

Land use demands in the analysis area are mainly for utility ROWs, roads, communication ROWs, groundwater development, grazing, and dispersed recreation. Grazing and dispersed recreation uses are described in Sections 3.4 and 3.12, respectively. The 0.5-mile-wide BLM-designated SWIP utility corridor crosses the project area from east to west and contains several existing transmission facilities. Existing ROWs on BLM land in the area of analysis are listed in Table 3.11-1. Presently, the existing ROWs identified within the project area and surrounding analysis area include fiber-optic lines, transmission lines and facilities within the SWIP utility corridor, roads, and SNWA piezometers. Pending ROWs include the SNWA proposed water pipeline and associated groundwater development facilities. In addition, there are other proposed wind energy study areas in Spring Valley north of the SVWEF project area.

Table 3.11-1. Bureau of Land Management Rights-of-Way in the Analysis Area

Serial Number	Description	Location
NVN - 066394	AT&T fiber-optic facilities	Linear ROW that traverses the project area from east to west
NVN - 005685	Mt. Wheeler power transmission line	Linear ROW that traverses the project area from east to west
NVN – 0012310	NDOT road in Spring Valley	Linear ROW that traverses the western edge of the project area, generally from north to south
NVN – 046822	SBC/Nevada Bell buried communication line	Linear ROW that traverses the western edge of the project area, generally from north to south
NVN - 076179	NV Energy fiber-optic line	Linear ROW that traverses the project area from east to west
NVN – 005253	NV Energy transmission line	Linear ROW that traverses the project area from east to west
N - 84216	SNWA piezometers	Two locations: one within the northern block of the project area and one east of the project area
Pending	SNWA Ground Water Development Project	ROW that traverses the western edge of the project area, generally from north to south

Source: BLM (2009).

3.11.2 Special Designations

Special designations in the vicinity of the project area include ACECs. An ACEC is a designation given to BLM lands that meet special relevance and importance criteria set forth by the BLM. The area must have special relevance to natural, cultural, or historic resources and importance such that special management is required to protect the value of these resources. The size of the ACEC should be as large as is necessary to protect these resources (BLM 1988).

The ACECs in proximity to the project area consist of the Rose Guano Cave and Swamp Cedar ACECs. The BLM Ely RMP identifies both ACECs as ROW avoidance areas and as closed to renewable energy facilities. Because they are both identified as closed to renewable energy facilities, the SVWEF project area does not overlap either ACEC.

The 40-acre Rose Guano Cave ACEC is located approximately 4 miles northeast of the nearest proposed WTG within the project area. This ACEC has been known historically as a location that was mined for phosphate rock and bat guano (BLM 2005:Appendix Q) and in its current state provides a roosting location for a substantial number of Brazilian free-tailed bats, which use the cave as a migratory stopover (Sherwin 2009). Brazilian free-tailed bats are discussed in Section 3.3.6.

The Swamp Cedar ACEC is adjacent to the project area. This ACEC was designated for several reasons as it provides habitat that is essential to maintaining species diversity, supports rare and endemic plant species, and is a significant historical site, where the Goshute War occurred in 1863.

The Swamp Cedar ACEC is characterized by the presence of Rocky Mountain juniper and is the "largest of three known occurrences of valley bottom ecotype or Rocky Mountain juniper woodlands" (BLM 2005:Appendix Q). As such, this ACEC comprises the largest example of this rare plant community, which is dependent on a hydrologic regime where soil conditions and runoff create a perched water table (BLM 2005:Appendix Q).

Swamp Cedar ACEC has been the site of numerous historical uses. Shoshone families once inhabited the area, prior to their deaths at the hands of U.S. soldiers, which occurred after conflicts arose between white settlers, Bannock Shoshone, and Ute (BLM 2005:Appendix Q). While the exact location is unknown, the Goshute War of 1863 was known to take place within or in the vicinity of the Swamp Cedar ACEC (BLM 2005:Appendix Q). This short battle resulted in the deaths of 23 Goshute and injury to one soldier (BLM 2005:Appendix Q). Additionally, several prehistoric sites have been recorded in the Swamp Cedar ACEC (BLM 2005:Appendix Q).

3.12 Recreation

The BLM manages recreation on public lands by identifying SRMAs. SRMAs have a distinct recreation market and corresponding management strategy. BLM-managed public lands not delineated as SRMAs are managed as extensive recreation management areas and do not require a specific management strategy or activity-level planning. The BLM Ely District Office has identified the project area as being within the Loneliest Highway SRMA, which is managed for a wide variety of recreational uses and opportunities to ensure a balance of recreation experiences (BLM 2008b). The Loneliest Highway SRMA extends north of U.S. Route 6/50 to the Elko County Line and encompasses 675,123 total acres. Although a site-specific recreation area management plan for the Loneliest Highway SRMA has not been prepared, several developed recreation sites and a variety of dispersed recreation opportunities, including motorized touring and hunting, are available. There is also an urban interface with the cities of Ely and McGill.

There are currently two BLM developed recreation sites near the project area: Cleve Creek campground and Sacramento Pass. Cleve Creek campground is located approximately 6 miles northwest of the project area on the east side of the Schell Creek Range. The campground has both individual and group camping sites. There are opportunities for hunting, fishing, horseback riding, hiking, and off-highway vehicle (OHV) riding on existing roads and trails. Sacramento Pass is located approximately 7 miles east of the project area along U.S. Route 6/50. There is a small pond stocked with fish, and there are several camping and picnic areas. There are opportunities for horseback riding, mountain biking, hiking, and wildlife observation.

Although there are no developed recreation sites within the project area, roads and trails in the project area are used for dispersed recreation on a limited basis. Dispersed recreation can occur on undeveloped BLM land that is open to the public for camping and general recreation. These areas do not include any developed amenities or recreation facilities. During field visits, SWCA observed evidence of recreation activities in the project area consisting of spent shotgun shells and multiple OHV tracks.

The project area occurs within the southeast corner of NDOW Game Management Unit 111. Game Management Unit 111 consists of 746,555 acres that stretch north to the Elko County line and includes a majority of the Schell Creek Range and Spring Valley (NDOW 2009). Within this unit, elk, mule deer, and pronghorn antelope are hunted by permit. Hunts for these game species occur from August to December; mule deer hunts occur from August to November, elk hunts occur from November to December, and pronghorn hunts occur from late August to early September. Although there are mule deer and elk harvested from Game Management Unit 111, the project area is not identified as a recommended hunting area for these species. The Nevada Hunter Information Sheets for Game Management Unit 111 reports that most mule deer are found between 7,500 and 10,500 feet amsl and that most elk are found between 6,500 and 10,000 feet amsl (NDOW 2009). The elevation throughout the project area is less than 6,000 feet. Spring Valley is recommended by NDOW as a hunting area for pronghorn antelope.

In addition to BLM developed recreation sites and dispersed recreation opportunities near the project area, the 77,180-acre GBNP is located approximately 5 miles southeast of the project area in the Snake Range. Visitors to the GBNP must travel through Spring Valley past the project area when coming from the west. Within GBNP, recreation opportunities include interpretive programs at the visitor center and throughout the park, tours of Lehman Caves, overnight camping at six established campgrounds, and more than 60 miles of trails for hiking. Other recreation opportunities include backcountry skiing, snowshoeing, biking, bird watching, caving, fishing, horseback riding, picnicking, and pine nut gathering (NPS 2007).

3.13 Socioeconomics

With a population of 9,694, the primary industries in White Pine County are government services, mining, agriculture, and tourism (U.S. Census Bureau [Census Bureau] 2000; White Pine County Tourism and Recreation Board 2008). White Pine County contains nearly 400 businesses offering a variety of products and services, including restaurants, hotels, and construction services (White Pine County Tourism and Recreation Board 2008). Mining operations are a larger source of employment in White Pine County. Private non-agricultural employment in White Pine County in 2007 was 2,784 (Census Bureau 2010). Mining represents one of the largest non-agricultural employers in White Pine County and is projected at 837 workers for 2010 (Nevada State Demographer 2008). Other employers in the County include federal and local governments, the school district, service industries, utilities, and agriculture. The median household income in the County in 2008 was $49,209. While the project area itself does not contain any residential areas, residences do occur as near as the Bastian Creek Ranch, north of the project area and at Sacramento Pass east of the project area.

White Pine County relies on revenues from a variety of taxes to fund essential services. Real property and personal property taxes levied at the county level include taxes on personal property, residential, commercial, and industrial property. In 2008, the projected White Pine County government expenditures totaled $60,698,361 (Nevada Department of Taxation 2009).

The Census Bureau has not developed projections for the cities of Ely and Baker since the 2000 census. The Nevada State Demographer recently released 2008 population estimates for Nevada's counties, cities, and towns. The information presented is the best available data on socioeconomic conditions in White Pine County. Located approximately 25 miles west of the project area and containing approximately 45% of the population of White Pine County, the town of Ely has a population of 4,352 (Census Bureau 2000).

While the Census Bureau does not provide data for the town of Baker, Nevada, which is 30 miles east of the project area, it does provide data for the zip code in which Baker is located. In the year 2000, this zip code (89311) had a population of 160 people, which is 1.7% of the population of White Pine County (Census Bureau 2000).

Several private land parcels occur north, east, and south of the project area (see Figure 2.1.1). These lands are within the 2-mile buffer of the project area. The private parcel to the north is directly adjacent to the project area and includes the Bastian Creek Ranch residence and grazing operations facilities. The private lands to the east are currently unoccupied. The private lands to the south are occupied, and the landowner has subdivided the property for additional residential development in the future (personal communication, Robert Benson, member of the public, to Wells McGiffert, BLM, January 11, 2010).

3.14 Air Quality

3.14.1 Existing Ambient Air Quality

Air quality is determined by the ambient concentrations of pollutants that are known to have detrimental effects. The EPA has classified National Ambient Air Quality Standards for six criteria pollutants: carbon monoxide (CO), nitrogen dioxide, particulate matter with diameter of 10 microns or less (PM_{10}), particulate matter with diameter of 2.5 microns or less ($PM_{2.5}$), ozone, sulfur dioxide, and lead. Areas with air quality that do not meet the standards are designated "non-attainment areas" by the EPA. The Nevada Division of Environmental Protection enforces air quality regulations in the project area. The project area is in attainment for all criteria pollutants.

Air quality in the project area is typical of the undeveloped areas of the great basin. Although the project area is in attainment for all criteria pollutants, PM is a pollutant of concern. Existing sources of PM in Spring Valley include motorized travel across dirt surface roads and trails, wind blowing across un-vegetated areas, wild fires, road work, and construction activities.

3.14.2 Climate Change

While the scientific understanding of climate change continues to evolve, the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report stated that warming of Earth's climate is unequivocal, and that warming is very likely attributable to increases in atmospheric greenhouse gases (GHGs) caused by human activities (anthropogenic) (IPCC 2007). The release of anthropogenic GHGs and their potential contribution to global warming are inherently cumulative phenomena. The Fourth Assessment Report indicates that changes in many physical and biological systems, such as increases in global temperatures, more frequent heat waves, rising sea levels, coastal flooding, loss of wildlife habitat, spread of infectious disease, and other potential environmental impacts are linked to changes in the climate system, and that some changes could be irreversible. GHGs, which include carbon dioxide (CO_2), methane, and nitrous oxide, are chemical compounds in the Earth's atmosphere that trap heat. Of these gases, CO_2 is recognized by the IPCC as the primary GHG affecting climate change. Present atmospheric concentrations of CO_2 are believed to be higher than at any time in at least the last 650,000 years, primarily as a result of combustion of fossil fuels. It is also very likely that observed increases in CO_2 are partially due to fossil fuel use, according to the IPCC (2007) Fourth Assessment Report.

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 Introduction

This chapter presents the anticipated environmental consequences of implementation of each alternative as described in Chapter 2. For the analysis, existing data, appropriate scientific methodologies, and professional judgment were used. The analysis also takes into account the resource conservation measures identified in Chapter 2, including referenced appendices. This analysis was done using the best available information, including site-specific data collected during bird and bat studies, cultural resource inventories, and visual contrast analysis. Additional data from the PEIS and from federal and state agencies for resources in the area were used to support the analysis. Impacts that occur under more than one alternative (including the Proposed Action) are discussed under the Proposed Action and are then referenced under other alternatives.

Only those resources and resource uses that would potentially be impacted by any of the alternatives are brought forward for detailed analysis and discussed in Chapter 4. Impacts are defined as modifications to the existing environment brought about by implementing an alternative. Impacts can be beneficial or adverse, can result from the action directly or indirectly, and can be long-term, short-term, temporary, or cumulative in nature. Direct impacts are attributable to implementation of an alternative that affects a specific resource and generally occur at the same time and place. Indirect impacts can result from one resource affecting another (e.g., soil erosion and sedimentation affecting water quality) or can occur later in time or removed in location but can be reasonably expected to occur. Long-term impacts are those that would substantially remain for many years or for the life of the project. Short-term impacts result in changes to the environment that are stabilized or mitigated rapidly and without long-term effects.

The analysis in this chapter provides a quantitative or qualitative comparison (depending on available data and the nature of the impact) of alternative impacts and establishes the severity of those impacts in the context of the existing environment.

4.2 Wildlife

This section discusses impacts to wildlife from the construction and operation of the SVWEF. Both indirect and direct impacts are analyzed for wildlife and their habitats. The impacts analysis for wildlife is an assessment of the increased risk of mortality and changes to wildlife habitat that would result from the construction and operation of the wind energy facility under the Proposed Action and alternatives. As discussed above, wildlife resources consist of reptiles and amphibians, small mammals, big game, birds (waterfowl and shorebirds, song birds, birds of prey and vultures), and bats. Impacts to special-status species are described in Section 4.3. Because mortality and changes to wildlife habitat would be the primary direct impacts of the wind energy facility on wildlife resources, the relative impacts to wildlife were assessed by comparing the changes that would result from the construction and operation of the wind facility under the alternatives. Wherever possible, impacts are discussed in quantifiable terms.

The impacts analysis of wildlife resources takes into account the implementation of the design features described in Section 2.1.4. Additionally, the impacts analysis of wildlife resources takes into account the implementation of measures and actions described in the Restoration and Weed Management Plan (see Appendix A), ABPP (see Appendix F), and SWPPP and SPP (see Appendix D).

4.2.1 Programmatic Environmental Impact Statement Impacts Summary

Potential impacts to wildlife from a typical wind energy facility are described in Section 5.9.2.2 and 5.9.3.2 of the PEIS and are consistent with this project. Because this EA tiers to the PEIS, a brief summary of those impacts to wildlife that are relevant to the Proposed Action is presented below. A summary of the related mitigation measures for wildlife that have been fully analyzed in the PEIS is provide in Section 6.2 of this EA. The impacts and mitigation measures analyzed and described for the PEIS are herein incorporated into this document.

4.2.1.1 CONSTRUCTION

Potential impacts to wildlife from a typical wind energy facility are described in Section 5.9.2.2 of the PEIS. The impacts to wildlife associated with construction of wind energy facilities would occur from 1) habitat reduction, alteration, or fragmentation; 2) introduction of invasive vegetation; 3) injury or mortality of wildlife; 4) decrease in water quality from erosion and runoff; 5) fugitive dust; 6) noise; 7) exposure to contaminants; and 8) interference with behavioral activities. Table 4.2-1 provides a summary of the potential construction impacts to wildlife and describes which species they would affect and to what extent and duration.

Table 4.2-1. Potential Wind Energy Construction Effects on Wildlife

Wildlife Stressor	Associated Project Activity or Feature	Potential Effect and Likely Wildlife Affected	Effect Extent and Duration
Habitat Disturbance – Section 5.9.2.2.1	Site clearing and grading; turbine and tower construction; access road and utility corridor construction; construction equipment travel.	Reduction or alterative on on-site habitat; all wildlife.	Long-term habitat reduction within tower, building, and access road footprints; long-term reduction in habitat quality in other site areas (utility and transmission corridors).
Invasive vegetation – Section 5.9.2.2.2	Site clearing and grading; turbine and tower construction; access road and utility corridor construction; construction equipment travel.	Reduced habitat quality; all wildlife.	Long term if established in areas where turbines, support facilities, and access roads are situated.
Direct injury or mortality – Section 5.9.2.2.3	Site clearing and grading; turbine and tower construction; access road and utility corridor construction; construction equipment travel.	Destruction and injury of wildlife with limited mobility; amphibians, reptiles, birds, and mammals.	Permanent within construction footprints of turbines, support facilities, and access roads; short term in areas adjacent to construction area.
Erosion and runoff – Section 5.9.2.2.4	Site clearing and grading; turbine and tower construction; access road and utility corridor construction; construction equipment travel.	Reduced reproductive success of amphibians using on-site surface waters; drinking water supplies may be affected.	Short term; may extend beyond site boundaries.
Fugitive dust generation – Section 5.9.2.2.5	Site clearing and grading; turbine and tower construction; access road and utility corridor construction.	Respiratory impairment; all wildlife.	Short term.
Noise – Section 5.9.2.2.6	Site clearing and grading; turbine and tower construction; access road and utility corridor construction; construction equipment travel.	Disturbance of foraging and reproductive behaviors; habitat avoidance; birds and mammals.	Short term.
Exposure to contaminants – Section 5.9.2.2.7	Accidental spill during equipment refueling; accidental release of stored fuel or hazardous materials.	Exposure may affect survival, reproduction, development, or growth; all wildlife.	Short term and localized to spill area.

Table 4.2-1. Potential Wind Energy Construction Effects on Wildlife (Continued)

Wildlife Stressor	Associated Project Activity or Feature	Potential Effect and Likely Wildlife Affected	Effect Extent and Duration
Interference with behavioral activities – Section 5.9.2.2.8	Site clearing and grading; turbine and tower construction; access road and utility corridor construction; construction equipment travel. Site clearing and grading; turbine and tower construction; access road and utility corridor construction; construction equipment travel.	Disturbance of migratory movements; avoidance of construction areas by migrating birds and mammals. Disturbance of foraging and reproductive behaviors; birds and mammals.	Short term. Short term for some species, long term for other species that may completely abandon the disturbed habitats and adjacent areas.

Source: BLM (2005).

4.2.1.2 OPERATIONS AND MAINTENANCE

Potential impacts to wildlife from the operation and maintenance of a typical wind energy facility are described in Section 5.9.3.2, Operational Effects on Wildlife, of the PEIS. The impacts to wildlife associated with the operation and maintenance of wind energy facilities would occur from 1) electrocution from transmission lines; 2) noise; 3) the presence of, or collision with, turbines, MET towers, and transmission lines; 4) predation; 5) mowing; 6) exposure to contaminants; 7) disturbance associated with activities of the wind energy project workforce; 8) decreased aquatic habitat quality; and 9) interference with behavioral activities. Table 4.2-2 provides a summary of the potential operational impacts to wildlife and describes which species they would affect, to what extent, and with what duration.

Table 4.2-2. Potential Wind Energy Operations and Maintenance Effects on Wildlife

Wildlife Stressor	Activity	Potential Effect and Likely Wildlife Affected	Effect Extent and Duration
Electrocutions – Section 5.9.3.2.1	Electric transmission lines and electrical utility lines.	Mortality of birds.	On-site, low magnitude, but long term.
Noise – Section 5.9.3.2.2	Turbine operation, support machinery, motorized vehicles, and mowing equipment.	Disturbance of foraging and reproductive behaviors of birds and mammals; habitat avoidance.	Short and long term; greatest effect in highest noise areas.
Collision with turbines, towers, and transmission lines – Section 5.9.3.2.3	Presence and operation of turbines; presence of transmission and MET towers and transmission lines.	Injury or mortality of birds and bats.	On-site, low magnitude but long term for many species; population effects possible for other species.
Predation	Transmission and MET towers.	Increase in avian predators due to more perch sites for foraging; may decrease local prey populations.	Long term; may be of high magnitude for some prey species.
Mowing – Section 5.9.3.2.4	Mowing at support building and turbine locations.	Injury and/or mortality of less mobile wildlife; reptiles, small mammals, ground-nesting birds.	Short term.
Exposure to Contaminants – Section 5.9.3.2.5	Accidental spill or release of pesticides, fuel, or hazardous materials.	Exposure may affect survival, reproduction, development, or growth; all wildlife.	Short or long term, localized to spill locations.
Workforce presence – Section 5.9.3.2.6	Daily human and vehicle activities.	Disturbance of nearby wildlife and bird and mammal behavior; habitat avoidance.	Short or long term, localized and of low magnitude.

Table 4.2-2. Potential Wind Energy Operations and Maintenance Effects on Wildlife (Continued)

Wildlife Stressor	Activity	Potential Effect and Likely Wildlife Affected	Effect Extent and Duration
Decreased aquatic habitat quality – Section 5.9.3.3	Erosion and runoff from poorly stabilized surface soils.	Reduced reproductive success of amphibians; wildlife drinking water supplies may be affected.	Short or long term, localized.
Interference with behavioral activities – Section 5.9.3.2.7	Presence of wind facility and support structures	Migratory mammals may avoid previously used migration routes, potentially affecting condition and survival. Species may avoid areas surrounding the wind energy facility, including foraging and nesting habitats.	Long term, localized to populations directly affected by the presence of the facility. Long term for species that completely abandon adjacent areas; population-level effects possible for some species.

Source: BLM (2005).

4.2.2 Proposed Action

Project-specific impacts to wildlife from the construction and operations associated with the Proposed Action are described below based on the PEIS effects analysis. The effects of fugitive dust and exposure to contaminants on wildlife and wildlife habitat that are discussed in Sections 5.9.2.2.5 and 5.9.2.2.7 of the PEIS sufficiently describe project-specific impacts for all wildlife, and no further analysis is included in this EA.

4.2.2.1 REPTILES AND AMPHIBIANS

4.2.2.1.1 Construction

Habitat disturbance. Construction activities would result in the short-term disturbance of 336.9 acres of habitat for the Great Basin spadefoot toad (*Spea intermontana*) and the reptile species identified in Section 3.2.1; this represents 3.9% of total habitat within the project area. Although construction activities are expected to last 9 to 12 months, it could take up to 10 years before temporary disturbance areas are successfully reclaimed. Even when vegetation is established following reclamation efforts, the composition of species in the recovery area is often different from the original plant community, which could have a diminished quality of habitat for those species.

Construction activities would result in the long-term removal of 111.1 acres of habitat, or 1.3% of the project area, necessary for the wind turbine pads, O&M building, access road footprints, and associated infrastructure. This habitat disturbance would occur for the duration of the 30-year SVWEF and the subsequent 10 years anticipated for successful decommissioning and reclamation.

Invasive vegetation. The Proposed Action would result in reduced habitat quality from the spread of existing invasive vegetation and the introduction of new species of invasive vegetation. Invasive vegetation degrade wildlife habitat in several ways. Weeds outcompete most native plants and can lead to a homogeneous vegetative landscape. Weedy habitats often contain fewer highly nutritious forage species for grazers and herbivores. A heavy weed invasion would either displace wildlife from this habitat or lead to reduced health for individuals. Furthermore, some invasive species, such as cheat grass, are fire dependent and create an environment that is prone to frequent wildfires. The potential for invasive vegetation that is currently occurring in Spring Valley to spread, and for new invasive species to be introduced, would be highest along the linear features of Proposed Action—the roads and collection system.

Measures for reducing the spread and establishment of noxious and invasive weeds are included in the Restoration and Weed Management Plan in Appendix A. Implementation of measures identified in the plan would reduce the risk of spreading invasive vegetation currently occurring in Spring Valley, as well as reducing the risk of introducing new invasive species from locations with known invasive vegetation problems.

Direct injury or mortality. Reptile and amphibian species in the project area have limited mobility and would not be able to easily avoid construction vehicles and equipment. Injury and mortality of individual animals would occur as a result of site clearing, grading, and excavation as well as vehicle movement throughout the project area. The risk of injury or mortality from clearing, grading, and excavation activities would last for the 9- to 12-month construction period. The risk from increased vehicle movement in the project area would remain throughout the 30-year life of the SVWEF. Wetland areas would be avoided as part of the Proposed Action, reducing the risk of injury and mortality to amphibians, including the Great Basin spadefoot toad, which uses these areas during breeding.

Erosion and runoff. Changes in surface water quality would result in reduced reproductive success of amphibians using on-site surface waters. Increased erosion and runoff as a result of the Proposed Action would change surface water quality during the 9- to 12-month construction period. Because the effects would be localized to surface waters receiving increased site runoff in the project area and the slope throughout the project area is less than 10%, the risk of increased erosion and runoff affecting surface water quality is minimal.

A SWPPP and SPP have been prepared for the SVWEF (see Appendix D). The plans would further reduce the risk of changes to surface water quality by establishing the practices that would be implemented to control erosion and the release of pollutants in stormwater runoff. In addition, wetlands in the project area would be avoided as part of the Proposed Action, further reducing the risk of changes to the water quality in habitat for amphibians, including the Great Basin spadefoot toad, which uses these areas during breeding.

Noise. Increased noise associated with construction activities would reduce the quality of reptile and amphibian habitat intermittently throughout the 9- to 12-month construction phase. Noise levels for typical equipment that would be used during the construction phase range between 80 to 90 dBA at a distance of 50 feet. The intensity of construction activity would vary over the course of the 9- to 12-month construction phase as equipment is moved throughout the area to complete the different facilities, infrastructure, and WTGs. Increased noise from construction would lead to habitat avoidance and would disrupt the foraging and reproductive behavior of reptiles and amphibians for the duration of the construction phase.

Interference with behavioral activities. Reptile and amphibian species in the project area have limited mobility and would not be able to easily avoid construction vehicles and equipment. Additionally, disturbances to behavioral activities, including foraging, mating, and nesting, would result from construction activities during the 9- to 12-month construction period. Reptiles and amphibians may avoid foraging or breeding behavior or vacate sites entirely in areas where construction is occurring. Reptiles and amphibians are expected to return to the project area once construction activities are complete.

4.2.2.1.2 Operation and Maintenance

Predation. The addition of a 400-foot-long overhead 230-kV connector transmission line would result in additional perch sites on new transmission line poles for avian predators in the project area. The 230-kV aboveground line connecting the Spring Valley substation and the Osceola switching station to the NV Energy 230-kV transmission line is the only aboveground transmission line. Because NV Energy 230-kV line currently has numerous transmission line poles, perch sites are not a limiting factor in the area;

therefore, there would be a negligible increase in predation of reptiles and amphibians along the new line throughout the 30-year duration of the SVWEF.

Workforce presence. Reptile and amphibian species in the project area have limited mobility and would not be able to easily avoid operations and maintenance vehicle movement throughout the project area. Increased risk of injury and mortality of individual animals would occur as a result of the maintenance and operations activities of the project workforce throughout the 30-year duration of the SVWEF.

Decreased aquatic habitat quality. Increased erosion and runoff would result from the increase in impermeable surfaces in the project area, 111.1 acres. Erosion and runoff would result in reduced aquatic habitat quality. Because the effects would be localized to surface waters receiving increased site runoff in the project area and the slope throughout the project area is less than 10%, the risk of increased erosion and runoff affecting aquatic habitat is minimal. The SWPPP and SPP (see Appendix D) describe the final stabilization/termination design to minimize erosion and prevent stormwater impacts after construction is complete. Additionally, wetland areas would be avoided as part of the Proposed Action, reducing the risk to aquatic habitat.

4.2.2.2 SMALL MAMMALS

4.2.2.2.1 Construction

Habitat disturbance. Construction activities would result in the short-term disturbance of 336.9 acres of small mammal habitat, which represents 3.9% of total habitat within the project area. As described in Appendix A, a Restoration and Weed Management Plan would be completed and would include post-construction reclamation of short-term disturbance areas for small-mammal habitat. It could take up to 10 years before short-term disturbance areas are successfully reclaimed. Even when vegetation is established following reclamation efforts, the composition of species in the recovery area is often different from the original plant community, which could have a diminished quality of habitat for those species.

Construction activities would result in the long-term removal of 111.1 acres of habitat, or 1.3% of the project area necessary for the wind turbine pads, O&M building, access road footprints, and associated infrastructure. This habitat disturbance would occur for the duration of the 30-year SVWEF and the subsequent 10 years for successful decommissioning and reclamation.

Invasive vegetation. The Proposed Action would result in reduced habitat quality from the spread of existing invasive vegetation and the introduction of new species of invasive vegetation. Invasive vegetation degrade wildlife habitat in several ways. Weeds outcompete most native plants and can lead to a homogeneous vegetative landscape. Weedy habitats often contain fewer highly nutritious forage species for grazers and herbivores. A heavy weed invasion would either displace wildlife from this habitat or lead to reduced health for individuals. Furthermore, some invasive species, such as cheat grass, are fire dependent and create an environment that is prone to frequent wildfires. The potential for invasive vegetation that is currently occurring in Spring Valley to spread and for new invasive species to be introduced would be highest along the linear features of Proposed Action—the roads and collection system.

Measures for reducing the spread and establishment of noxious and invasive weeds are included in the Restoration and Weed Management Plan in Appendix A. Implementation of measures identified in the plan would reduce the risk of spreading invasive vegetation currently occurring in Spring Valley, as well as reducing the risk of new invasive species from arriving from locations with known invasive vegetation problems.

Direct injury or mortality. Small-mammal species in the project area have limited mobility and would not be able to easily avoid construction vehicles and equipment. Injury and mortality of individual small

mammals would occur as a result of site clearing, grading, and excavation as well as vehicle movement throughout the project area. The risk of injury or mortality from clearing, grading, and excavation activities would last for the 9- to 12-month construction period. The risk from increased vehicle movements through the project area would remain throughout the 30-year life of the SVWEF.

Erosion and runoff. Drinking water supplies would be impacted as a result of changes in surface water quality in the project area. Increased erosion and runoff as a result of the Proposed Action would change surface water quality during the 9- to 12-month construction period. Because the effects would be localized to surface waters receiving increased site runoff in the project area and the slope throughout the project area is less than 10%, the risk of increased erosion and runoff affecting drinking water supplies for small mammals is minimal.

Noise. Increased noise associated with construction activities would reduce the quality of small-mammal habitat intermittently throughout the 9- to 12-month construction phase. Noise levels for typical equipment that would be used during the construction phase range between 80 to 90 dBA at a distance of 50 feet. The intensity of construction activity would vary over the course of the 9- to 12-month construction phase as equipment is moved throughout the area to complete the different facilities, infrastructure, and WTGs. Increased noise from construction would lead to habitat avoidance and would disrupt the foraging and reproductive behavior of small mammals for the duration of the construction phase.

Interference with behavioral activities. Small-mammal species in the project area have limited mobility and would not be able to easily avoid construction vehicles and equipment. Additionally, disturbances to behavioral activities, including foraging, mating, and nesting, would result from construction activities during the 9- to 12-month construction period. Small mammals may avoid foraging, breeding behavior, or vacate sites entirely in areas where construction is occurring. Small mammals are expected to return to the project area once construction activities are complete.

4.2.2.2.2 Operation and Maintenance

Noise. The highest noise levels would occur in areas adjacent to the WTGs. Noise levels of 55 dBA, consistent with the current ambient noise level in the area, are projected by the turbine manufacturer to occur at 400 feet from the WTGs. Within the 400-foot area surrounding WTGs, the increased noise from the operation of WTGs may lead to reduced habitat use and disruption of foraging and reproductive behavior of small mammals.

Predation. The addition of a 400-foot-long overhead 230-kV connector transmission line would result in additional perch sites on new transmission line poles for avian predators in the project area. The 230-kV aboveground line connecting the Spring Valley substation and the Osceola switching station to NV Energy 230-kV transmission line is the only aboveground transmission line. Additionally, some species of small mammals such as ground squirrels and cottontails are attracted to the disturbed habitat common on the edge of project developments. Because the NV Energy 230-kV line currently has numerous transmission line poles, perch sites are not a limiting factor in the area; therefore, there would be a negligible increase in predation of small mammals along the new line throughout the 30-year duration of the SVWEF.

Workforce presence. Small-mammal species in the project area have limited mobility and would not be able to easily avoid operations and maintenance staff and vehicle movement throughout the project area. Regular vehicle traffic on access roads in the project area would occur throughout the year over the 30-year duration of the SVWEF. Increased risk of injury and mortality of individual small mammals would occur as a result of the maintenance and operations activities of the project workforce.

4.2.2.3 BIG-GAME SPECIES

4.2.2.3.1 Construction

Habitat disturbance. Elk, mule deer, and mountain lion are known to use the project area to a minimal degree. Pronghorn regularly use the valley floor in Spring Valley and would be displaced from the project area for approximately 9 to 12 months during construction. All 8,565 acres should be considered an effective loss of habitat during construction, which equates to a 1.5% loss of available habitat in the Spring Valley watershed, but no loss of crucial wintering habitat. Permanent removal of 111.1 acres of habitat would constitute only 1.3% of the available habitat in Spring Valley. The Restoration and Weed Management Plan (see Appendix A) includes post-construction reclamation of short-term disturbance areas for big-game habitat, which could have a diminished quality of habitat for those species.

Invasive vegetation. Impacts from the spread of invasive vegetation on big-game habitat would be the same as those described for small mammals.

Direct injury or mortality. Big-game species in the project area are highly mobile and would be able to avoid vehicle traffic, clearing, grading, and excavation activities that would occur during the 9- to 12-month construction period. Construction site speed limits of 25 mph would further reduce the risk of direct injury or mortality to big-game species.

Erosion and runoff. Drinking water supplies would be impacted as a result of changes in surface water quality in the project area. Increased erosion and runoff as a result of the Proposed Action would change surface water quality during the 9- to 12-month construction period. Because the effects would be localized to surface waters receiving increased site runoff in the project area and the slope throughout the project area is less than 10%, the risk of increased erosion and runoff affecting drinking water supplies for big-game species is minimal.

Noise. Increased noise associated with construction activities would reduce the quality of wildlife habitat intermittently throughout the 9- to 12-month construction phase. Because big-game species in the project area are highly mobile, increased noise associated with construction of the Proposed Action would result in habitat avoidance for the duration of the construction phase. Big-game species are expected to return to portions of the project area as construction activities rotate throughout the project area.

Interference with behavioral activities. Because big-game species in the project area are highly mobile, increased activity associated with construction of the Proposed Action would result in habitat avoidance for the duration of the construction phase as described under habitat disturbance. Big-game species habitat is common and occurs throughout the Spring Valley watershed. In addition, big-game species are expected to return to portions of the project area over the course of the construction phase as activities rotate throughout the project area.

4.2.2.3.2 Operation and Maintenance

Noise. The highest noise levels would occur in areas adjacent to the WTGs. Noise levels of 55 dBA, consistent with the current ambient noise level in the area, are projected by the turbine manufacturer to occur at 400 feet from the WTGs. Within the 400-foot area, the increased noise from the operation of WTGs may lead to short-term intermittent disruptions in the foraging behavior of big-game species when wind levels and associated noise are highest.

Workforce presence. Because of the low amounts of human activity throughout the project area during the long-term operation, big-game species are expected to return to the habitat within and adjacent to the project area following construction.

Interference with behavioral activities. Changes in behavioral activities of big-game species would be consistent with those impacts described under Noise and Workforce presence above. Additionally, Johnson et al. (2000) found that pronghorn numbers at the Foote Creek Rim project in Wyoming did not decrease following construction of that facility. Walter et al. (2006) conducted a radio-telemetry and fecal sampling study on elk at a wind power development in southwestern Oklahoma and found that elk were not adversely affected by wind power operations. They found that elk did not leave the study area, regularly crossed facility roads, and appeared not to be alarmed or stressed when directly observed. They also determined through fecal sampling that nutritional intake was not affected. This suggests that big-game behavior would be minimally affected by the routine operations following construction.

The new 3.6-mile-long Bastian Creek Allotment fence and 5.6-mile-long Majors Allotment fence would be constructed to meet specifications for cattle and wildlife (BLM Manual 1737). The additional fence line may impede the movements of big-game species, although it would be designed and constructed to allow the passage of mule deer, elk, and pronghorn.

4.2.2.4 WATERFOWL AND SHOREBIRDS

4.2.2.4.1 Construction

Habitat disturbance. Construction activities would not result in the removal of wetland and open water habitat, but may result in a short-term, indirect reduction in water quality from construction runoff near several wetlands in the northern portion of the project area. The SWPPP and SPP (see Appendix D) provide measures to reduce harmful runoff into wetland areas.

Invasive vegetation. The Proposed Action would result in reduced habitat quality from the spread of existing invasive vegetation and the introduction of new species of invasive vegetation. The potential for invasive vegetation that is currently occurring in Spring Valley to spread and for new invasive species to be introduced would be highest along the linear features of Proposed Action, the roads and collection system. Because the roads and collection system would be located away from drainage bottoms and wetlands and would be located to minimize stream crossings and avoid damage to wetlands, the effects of invasive vegetation on waterfowl and shorebird habitat quality would be minimal.

Direct injury or mortality. Construction activities and increased vehicle traffic associated with the Proposed Action would result in an increased risk of injury and mortality to individual waterfowl and shorebirds from collisions in the project area. Waterfowl and shorebirds are highly mobile and would be able to avoid vehicle traffic, clearing, grading, and excavation activities that would occur during the 9- to 12-month construction period.

Erosion and runoff. Habitat and drinking water supplies would be impacted as a result of changes in surface water quality in the project area. Increased erosion and runoff as a result of the Proposed Action would change surface water quality during the 9- to 12-month construction period. Because the effects would be localized to surface waters receiving increased site runoff in the project area and the slope throughout the project area is less than 10%, the risk of increased erosion and runoff affecting habitat and drinking water supplies for waterfowl and shorebirds is minimal.

Noise. The increased noise associated with construction of the Proposed Action would be audible at wetland habitat within the project area intermittently throughout the 9- to 12-month construction phase. Increased noise would discourage waterfowl and shorebird species use of the project area.

Interference with behavioral activities. Because the roads and collection system would be located away from drainage bottoms and wetlands, and undisturbed nesting habitat occurs outside the project area, the effects of construction activities waterfowl and shorebird behavior would be minimal.

4.2.2.4.2 Operation and Maintenance

Electrocution. The 400-foot-long overhead 230-kV connector transmission line connecting the Spring Valley substation and the Osceola switching station to the NV Energy 230-kV transmission line is the only aboveground transmission line being added under the Proposed Action. The addition of the 230-kV line would result in an increased risk of electrocution to waterfowl and shorebirds flying through the project area. Because the additional 230-kV transmission line would be in close proximity to the existing NV Energy 230-kV line, there would be a minor increase in the risk of electrocution to waterfowl and shorebirds throughout the 30-year duration of the SVWEF.

Noise. The highest noise levels would occur in areas adjacent to the WTGs. Noise levels of 55 dBA, consistent with the current ambient noise level in the area, are projected by the turbine manufacturer to occur at 400 feet from the WTGs. Within that 400-foot area, noise levels from the operation of WTGs could be as high as 60 dBA and may result in reduced nesting and hunting behavior and habitat avoidance by waterfowl and shorebird species. The reduction in habitat quality for waterfowl and shorebirds surrounding WTGs would be less than 1% of available habitat in the Spring Valley watershed.

Collision with turbines, towers, and transmission lines. In general, impacts from the routine operation and maintenance of the SVWEF would be the same as those described for the PEIS. However, turbines installed near water sites would have an increased potential for waterfowl and shorebird strikes. To date researchers have not been able to make a strong correlation between pre-construction data and post-construction mortality for birds (National Wind Coordinating Collaborative [NWCC] 2010); making it impossible to provide an accurate quantitative assessment of mortality to these species. Therefore, pre-construction data have been used to site turbines away from higher use areas, to develop design features and mitigation measures, and to identify mortality risk potential for the species observed (SWCA 2009a:Section 3.1.2; Table 4.2-3). The risk potential is based on site-specific observations of flight characteristics in the RSA and not realized mortality at current wind facilities. For example, common raven has the highest risk index (RI), but is rarely recorded as a mortality relative to abundance. Therefore, the RI provides a measurement of mortality potential, but cannot be used to quantify actual mortality.

Additionally, an avian mortality threshold has been developed based on an assessment of 11 other projects with the most similar habitats or environmental factors available (see Appendix F:Table 3). The assessment provides an average mortality rate for those facilities (2.70 birds/turbine/year). That mortality rate is used as a threshold (2.7 × 75 turbines = 203 birds/year) so as to not exceed typical impacts from a wind project in similar habitats; and therefore, remain consistent with the PEIS analysis. Should mortality levels exceed the threshold, adaptive management measures would be implemented to reduce mortality levels below the designated threshold.

Because mitigation measures identified as part of the Proposed Action, including those from the PEIS, would address impacts to most of the bird species observed on-site, impacts are anticipated to be low. To further address impacts to birds, the ABPP (see Appendix F) provides measures to adaptively manage impacts as they are determined through monitoring. Under the plan, a TAC would monitor SVWEF activities, including avian mortality data, to determine the need for project mitigations. The TAC would make recommendations to the BLM Authorized Officer on developing and implementing effective measures to monitor, avoid, and/or minimize impacts to avian species (see Appendix F:16–20). With the necessary data collected, the radar systems installed for the project would be used to trigger turbine shutdowns during high-risk periods for birds, specifically when high avian activity is coupled with low visibility (see Appendix F:5–7). Other shutdown times may be used as phase mitigation allows (see Appendix F:16–20). Additionally, if mortality thresholds defined in the plan for overall avian species are exceeded, the TAC would be responsible for identifying and recommending suitable mitigation(s). Through this adaptive management, no substantial impacts to local and migratory populations are

expected. Project-specific impacts to special-status shorebirds are described under Special-status Species (Section 4.3.2.2).

Table 4.2-3. Risk Indices for Avian Species Observed

Species	Frequency (% of Surveys Observed)	Number of Observations	Total Number of Observations in the RSA	% of Observations in RSA	Risk Index*
Common raven	74.4	543	38	7.0	5.2
Canada goose	9.4	64	33	51.6	4.8
Swainson's hawk	9.4	25	8	32.0	3.0
Mourning dove	5.0	15	8	53.3	2.7
Mountain bluebird	25.0	242	24	9.9	2.5
Golden eagle	8.1	13	4	30.8	2.5
Pinyon jay	11.3	194	37	19.1	2.2
Horned lark	46.3	1158	51	4.4	2.0
Brewer's blackbird	6.9	71	19	26.8	1.8
American kestrel	21.9	58	4	6.9	1.5
American robin	8.8	81	12	14.8	1.3
Red-tailed hawk	1.9	3	2	66.7	1.3
Long-billed curlew	3.1	13	4	30.8	1.0
Cooper's hawk	1.3	2	1	50.0	0.7
Ferruginous hawk	1.3	2	1	50.0	0.7
Yellow-headed blackbird	1.3	2	1	50.0	0.7
Turkey vulture	0.6	4	4	100.0	0.6
House finch	0.6	2	2	100.0	0.6
Northern harrier	15.0	29	1	3.4	0.5
Killdeer	6.9	15	1	6.7	0.5
Blue-gray gnatcatcher	6.3	18	1	5.6	0.4
Black-billed magpie	16.9	49	1	2.0	0.3
Sandhill crane	1.9	6	1	16.7	0.3
Tree swallow	6.3	34	1	2.9	0.2
Sage thrasher	6.9	32	1	3.1	0.2

* Risk Index = (Frequency × % of Observations in RSA) / 100

Predation. Because the additional 400-foot-long overhead 230-kV transmission line would not occur near wetland habitat and would be in close proximity to the existing NV Energy 230-kV line, the increased risk of predation of waterfowl and shorebirds throughout the 30-year duration of the SVWEF would not have a measurable change to the biological community.

Workforce presence. Because of the low amounts of human activity throughout the project area during the long-term operation, waterfowl and shorebirds are expected to return to the habitat within and adjacent to the project area following construction.

Decreased aquatic habitat quality. Increased erosion and runoff would result from the increase in impermeable surfaces in the project area. Erosion and runoff would result in reduced aquatic habitat

quality. Because the effects would be localized to surface waters receiving increased site runoff in the project area and the slope throughout the project area is less than 10%, the risk of increased erosion and runoff affecting aquatic habitat is minimal. One of the commitments identified in Section 2.4.1.2 states that wetlands would be avoided as part of the Proposed Action, further reducing the risk to aquatic habitat.

Interference with behavioral activities. Changes to the behavioral activities, including nesting behavior, of waterfowl and shorebirds would result from the presence of WTGs and associated facilities in the project area. Waterfowl and shorebirds typically nest near water sources, and killdeer is the only species of waterfowl or shorebird that was observed nesting within the project area. Other changes in behavioral activities of waterfowl and shorebird species would be consistent with those impacts described under Noise and Workforce presence.

4.2.2.5 SONGBIRDS

4.2.2.5.1 Construction

Habitat disturbance. Generally, songbirds nest in any of the vegetation communities found within the project area. Loss of habitat from short- and long-term disturbance or modification of general songbird habitat would occur and would be the same acreages as those described for small mammals.

Invasive vegetation. Impacts from the spread of invasive vegetation on general songbird habitat would be the same as those described for small mammals. Increased presence of invasive vegetation can indirectly affect songbirds by changing available food supplies in the project area.

Direct injury or mortality. Construction activities and increased vehicle traffic associated with the Proposed Action would result in an increased risk of injury and mortality to individual songbirds in the project area. Songbirds are highly mobile and would be able to avoid vehicle traffic, clearing, grading, and excavation activities that would occur during the 9- to 12-month construction period. Construction activities would be restricted during nesting season, as identified in Section 5.9.5.3.2 of the PEIS, to further reduce the risk of injury or direct mortality of nesting songbirds during construction.

Noise. The increased noise associated with construction of the Proposed Action would be audible throughout the project area over the course of the 9- to 12-month construction phase. Increased noise would result in habitat avoidance and changes to breeding behavior of songbirds in the project area.

Interference with behavioral activities. Changes in behavioral activities of songbird species would be consistent with those impacts described under Noise.

4.2.2.5.2 Operation and Maintenance

Electrocution. The 400-foot-long overhead 230-kV connector transmission line connecting the Spring Valley substation to the Osceola switching station onto the NV Energy 230-kV transmission line is the only aboveground transmission line being added under the Proposed Action. The addition of the 230-kV line would result in an increased risk of electrocution to songbirds flying through the project area. Because the additional 230-kV transmission line would be in close proximity to the existing NV Energy 230-kV line, there would be a minor increase in the risk of electrocution to songbirds throughout the 30-year duration of the SVWEF.

Noise. The highest noise levels would occur in areas adjacent to the WTGs. Noise levels of 55 dBA, consistent with the current daytime ambient noise level in the area, are projected by the turbine manufacturer to occur 400 feet from the WTGs. Within that 400-foot area, noise levels from the operation

of WTGs could be as high as 60 dBA and may result in reduced nesting and hunting behavior and habitat avoidance by songbird species.

Collision with turbines, towers, and transmission lines. In general, the risks of songbird injury or mortality from collisions with WTGs, towers, and transmission lines would be the same as those described for the PEIS. Passerines are the most common group of birds killed at new wind energy projects (BLM 2005). To date researchers have not been able to make a strong correlation between pre-construction data and post-construction mortality for birds (NWCC 2010); making it impossible to provide an accurate quantitative assessment of mortality to these species. Therefore, pre-construction data has been used to site turbines away from higher use areas, to develop design features and mitigation measures, and to identify mortality risk potential for the species observed (SWCA 2009a:Section 3.1.2; see Table 4.2-3). The risk potential is based on site-specific observations of flight characteristics in the RSA and not realized mortality at current wind facilities. For example, common raven has the highest RI, but is rarely recorded as a mortality relative to abundance. Therefore, the RI provides a measurement of mortality potential, but cannot be used to quantify actual mortality.

Additionally, an avian mortality threshold has been developed based on an assessment of 11 other projects with the most similar habitats or environmental factors available (see Appendix F:Table 3). The assessment provides an average mortality rate for those facilities (2.70 birds/turbine/year). That mortality rate is used as a threshold (2.70 × 75 turbines = 203 birds/year) so as to not exceed typical impacts from a wind project in similar habitats; and therefore, remain consistent with the PEIS analysis. Should mortality levels exceed the threshold, adaptive management measures would be implemented to reduce mortality levels below the designated threshold.

To further address impacts to birds, the ABPP (see Appendix F) provides measures to adaptively manage impacts as they are determined through monitoring. Under the plan, a TAC would monitor SVWEF activities, including avian mortality data, to determine the need for project mitigations. The TAC would make recommendations to the BLM Authorized Officer on developing and implementing effective measures to monitor, avoid, and/or minimize impacts to avian species (see Appendix F:16–20). With the necessary data collected, the radar systems installed for the project would be used to trigger turbine shutdowns during high-risk periods for birds, specifically when high avian activity is coupled with low visibility (see Appendix F:5–7). Other shutdown times may be used as phase mitigation allows (see Appendix F:16–20). Additionally, if mortality thresholds defined in the plan for overall avian species are exceeded, the TAC would be responsible for identifying and recommending suitable mitigation(s). Although injury or mortality of individual local and migratory songbirds would occur as a result of the presence of WTGs, implementation of the ABPP would address the risk that these impacts would result in population-level changes to the songbird species in the region.

Predation. Increased perching habitat for avian predators would result from adding the 230-kV aboveground connector transmission line connecting the Spring Valley substation to the Osceola switching station and onto the NV Energy 230-kV aboveground 230-kV line. Because the additional 230-kV transmission line would be in close proximity to the existing NV Energy 230-kV line, there would be a minor increased risk of predation of songbirds throughout the 30-year duration of the SVWEF.

Workforce presence. Because of the low amounts of human activity throughout the project area during the long-term operation, songbirds are expected to return to the habitat within and adjacent to the project area following construction.

Interference with behavioral activities. The introduction of WTGs and associated facilities is expected to result in small, local changes in migratory movements as songbirds fly over or around the new structures, continuing on their path, but would not result in regional changes to migratory movements.

Other impacts from routine operation and maintenance activities for the SVWEF would be similar for songbirds as are described for waterfowl and shorebirds. Reduced avian use within 50 to 100 m of a WTG as a result of WTG noise, maintenance activities, and reduced habitat attractiveness has been recorded at multiple wind facilities (Erickson et al. 2000; Johnsen et al. 2000; Leddy et al. 1999). Therefore, it is assumed that birds would occur near WTGs but that overall activity levels would be reduced within 100 m. This equates to a reduction in habitat quality of 582 acres, or 0.1% of general songbird nesting habitat in Spring Valley.

4.2.2.6 BIRDS OF PREY AND VULTURES

4.2.2.6.1 Construction

Habitat disturbance. Generally, birds of prey and vultures nest in any of the vegetation communities found within the project area. Impacts from short- and long-term disturbance or modification of habitat for birds of prey and vultures would be the same as those described for small mammals.

Invasive vegetation. Impacts from the spread of invasive vegetation would be the same as those described for small mammals.

Direct injury or mortality. Construction activities and increased vehicle traffic associated with the Proposed Action would result in an increased risk of injury and mortality to individual birds of prey and vultures in the project area. Birds of prey and vultures are highly mobile and would be able to avoid vehicle traffic, clearing, grading, and excavation activities that would occur during the 9- to 12-month construction period. Construction activities would be restricted during nesting season, as identified in Section 5.9.5.3.2 of the PEIS, to further reduce the risk of injury or direct mortality of nesting birds of prey and vultures during construction.

Noise. The increased noise associated with construction of the Proposed Action would be audible throughout the project area over the course of the 9- to 12-month construction phase. Increased noise would result in habitat avoidance and changes to breeding behavior of in the project area.

Interference with behavioral activities. Construction activities would result in a short-term disturbance to the migratory movements of raptors through Spring Valley. Because Spring Valley is not within a major migration corridor for birds of prey and vultures, and raptor migration surveys in Spring Valley resulted in a passage rate of 0.81 bird/hour (SWCA 2009a), the disturbance to migratory movements would be minor.

Four nests that could be used by raptors are known to occur in the project area, including one Swainson's hawk nest that was active in 2007. Turbines within 0.5 mile of known raptor nests and would increase the potential for temporary displacement during construction, if a breeding pair attempted to use one of these nests. The nearest recorded ferruginous hawk nest would be more than 1 mile from the closest WTG, consistent with USFWS guidelines for the species.

4.2.2.6.2 Operation and Maintenance

Electrocution. The 400-foot-long overhead 230-kV connector transmission line connecting the Spring Valley substation to the Osceola switching station onto the NV Energy 230-kV transmission line would be the only aboveground transmission line. The presence of a power line would increase the potential for birds of prey and vultures to be killed from power line collisions and electrocution. Power poles are attractive sites for birds of prey and vultures to perch, roost, loaf, and nest. This behavior brings birds into the proximity of live power lines and can often lead to collisions with wires and electrocution.

Noise. The highest noise levels would occur in areas adjacent to the WTGs. Noise levels of 55 dBA, consistent with the current daytime ambient noise level in the area, are projected by the turbine manufacturer to occur 400 feet from the WTGs. Within that 400-foot area, noise levels from the operation of WTGs could be as high as 60 dBA and may result in reduced nesting and hunting behavior and habitat avoidance by bird of prey and vultures.

Collision with turbines, towers, and transmission lines. WTGs located near known nest locations would have potential increased impacts to raptors as a result of turbine strikes. To date researchers have not been able to make a strong correlation between pre-construction data and post-construction mortality for raptors (NWCC 2010); making it impossible to provide an accurate quantitative assessment of mortality to these species. Therefore, pre-construction data has been used to site turbines away from higher use areas, to develop design features and mitigation measures, and to identify mortality risk potential for the species observed (SWCA 2009a:Section 3.1.1; Table 4.2-4). The risk potential is based on site-specific observations of flight characteristics in the RSA and not realized mortality at current wind facilities. For example, turkey vulture has the highest RI, but is rarely recorded as a mortality relative to abundance. Therefore, the RI provides a measurement of mortality potential, but cannot be used to quantify actual mortality.

Table 4.2-4. Risk Indices for Raptors Observed

Species	Frequency (% of Surveys Observed)	Number of Observations	Number of Observations in RSA	% of Observations in RSA	Risk Index*
Turkey vulture	44.4	33	10	30.3	13.5
Red-tailed hawk	30.6	20	8	40.0	12.2
Northern harrier	25.0	10	4	40.0	10.0
Golden eagle	19.4	8	4	50.0	9.7
American kestrel	22.2	10	3	30.0	6.7
Rough-legged hawk	8.3	4	2	50.0	4.2
Swainson's hawk	13.9	9	2	22.2	3.1
Prairie falcon	13.9	5	1	20.0	2.8
Sharp-shinned hawk	19.4	11	1	9.1	1.8
Cooper's hawk	8.3	6	1	16.7	1.4
Ferruginous hawk	16.7	6	0	0.0	–
Bald eagle	2.8	1	0	0.0	–

*RI = (Frequency × % of Observations in RSA) / 100

Additionally, an avian mortality threshold has been developed based on an assessment of 11 other projects with the most similar habitats or environmental factors available (see Appendix F:Table 3). The assessment provides an average mortality rate for those facilities (2.70 birds/turbine/year). That mortality rate is used as a threshold (2.7 × 75 turbines = 203 birds/year) so as to not exceed typical impacts from a wind project in similar habitats; and therefore, remain consistent with the PEIS analysis. Should mortality levels exceed the threshold, adaptive management measures would be implemented to reduce mortality levels below the designated threshold.

Turbines installed near water sites would have an increased potential for bird strikes; however, measures listed as part of the Proposed Action (Section 2.1.4) would help reduce impacts by avoiding areas where birds of prey congregate. Additionally, each year prior to the onset of the migratory bird breeding season (March 15 to July 30), raptor nests surveys would be completed to identify active nests within 0.5 mile of

a turbine. If a nest is found to be in use, the TAC would determine necessary action based on the ABPP (see Appendix F:10–11). To further address impacts to raptors, the ABPP (see Appendix F) provides measures to adaptively manage impacts as they are determined through monitoring. Under the plan, a TAC would monitor SVWEF activities, including raptor mortality data, to determine the need for project mitigations. The TAC would make recommendations to the BLM Authorized Officer on developing and implementing effective measures to monitor, avoid, and/or minimize impacts to raptor species (see Appendix F:16–20). With the necessary data collected, the radar systems installed for the project would be used to trigger turbine shutdowns during high-risk periods for birds, specifically when high avian activity is coupled with low visibility (see Appendix F:5–7). Other shutdown times may be used as phase mitigation allows (see Appendix F:16–20). Additionally, if mortality thresholds defined in the plan for overall avian species are exceeded, the TAC would be responsible for identifying and recommending suitable mitigation(s). Although injury or mortality of individual raptors would occur as a result of the presence of WTGs, towers, and transmission line, implementation of the ABPP would address the risk that increased injury or mortality would result in population-level changes to the raptor species in the region.

Workforce presence. Because of the low amounts of human activity projected to occur throughout the project area during the long-term operation, birds of prey and vultures are expected to return to habitat within and adjacent to portions of the project area following construction.

Interference with behavioral activities. Changes in behavioral activities of birds of prey and vulture are consistent with the changes described under construction impacts. The introduction of WTGs and associated facilities would result in changes to the migratory movements of raptors through Spring Valley. Additionally, the presence of WTGs would increase the risk of nest abandonment in and near the project area.

4.2.2.7 BATS

4.2.2.7.1 Construction

Habitat disturbance. During construction, there would be short-term disturbance to 336.9 acres of habitat that may provide foraging area for bats, which represents 3.9% of the total available foraging area within the project area. The loss of vegetation would occur as a result of construction of turbine foundations, the MET tower footprint, access roads, and ancillary facilities. All areas of temporary habitat disturbance would be reclaimed following the completion of construction activities, which are anticipated to last 9 to 12 months. Long-term disturbance areas would include wind turbine pads, O&M building, access road footprints, and associated infrastructure. Total long-term disturbance would include 111.1 acres of habitat that may provide foraging area for bats, or 1.3% of the project area. The habitat that would be lost does not have unique characteristics, relative to other habitat available in Spring Valley.

Invasive vegetation. Impacts from the spread of invasive vegetation would be the same as those described for small mammals.

Direct injury or mortality. Construction activities and increased vehicle traffic associated with the Proposed Action would result in an increased risk of injury and mortality to individual bats in the project area. Bats are likely to be present in the project area at night, when the majority of construction activities are not occurring. In addition, bats are highly mobile and would be able to avoid vehicle traffic, clearing, grading, and excavation activities that would occur during the 9- to 12-month construction period.

Noise. The increased noise associated with construction of the Proposed Action would be audible throughout the project area over the course of the 9- to 12-month construction phase. Increased noise may result in habitat avoidance and changes to foraging patterns in the project area. Because bats are likely to

be present in the project area at times when construction activities are not occurring, the impacts from increased noise would be minimal.

Interference with behavioral activities. Changes in behavioral activities of bats would be consistent with those impacts described under Noise.

4.2.2.7.2 Operation and Maintenance

Noise. There is no breeding or roosting habitat in the project area that would be affected by noise. Based on currently operating projects, bats are known to forage around wind turbines, and there is no current literature to support the hypothesis that increased noise from WTGs directly impacts bat species.

Collision with turbines, towers, and transmission lines. Injury or mortality to individual bats would likely result from development of the SVWEF due to collisions with turbine blades (Arnett et al. 2008; BLM 2005) and barotrauma (Baerwald et al. 2008). Barotrauma results when bats fly within low-pressure airspace created in the WTG blade's wake. To date researchers have not been able to make a strong correlation between pre-construction data and post-construction mortality for bats (NWCC 2010); making it impossible to provide an accurate quantitative assessment of mortality to these species. However, previous studies indicate that there is the potential to injure or kill numerous bats at wind energy facilities (Arnett 2005; BLM 2005; Kerlinger et al. 2006) and that some species, such as migratory tree roosting species, are more likely to be injured or killed at wind energy facilities (Arnett et al. 2008), especially during the fall migratory period (Arnett et al. 2008). A study by Arnett et al. (2008) showed that four of the eight general bat species identified through acoustic surveys have been reported as mortalities at other wind energy facilities and include little brown bat, big-brown bat, silver-haired bat, and hoary bat; therefore, these species are anticipated to be at increased risk, compared with other general bat species. Additionally, four species of bats are state protected, including the Brazilian free-tailed bat, pallid bat, Townsend's big-eared bat, and western red bat. State-protected bat species are described in detail under Sensitive Species in Section 4.3.2.6.

Additionally, a bat mortality threshold has been developed based on an assessment of 11 other projects with the most similar habitats or environmental factors available (see Appendix F:Table 3). The assessment provides an average mortality rate for those facilities (2.56 bats/turbine/year). That mortality rate is used as a threshold (2.56 × 75 turbines = 192 bats/year) so as to not exceed typical impacts from a wind project in similar habitats; and therefore, remain consistent with the PEIS analysis. Should mortality levels exceed the threshold, adaptive management measures would be implemented to reduce mortality levels below the designated threshold.

Adaptive management is discussed in the Revised Nevada Bat Conservation Plan (Bradley et al. 2006), which identifies wind energy development as an anthropogenic threat to bats. Bradley et al. (2006) recommends that rigorous post-construction monitoring take place at wind energy facilities in order to identify the effects on the local bat populations; as effects are understood, management and mitigation can be designed accordingly. The ABPP (see Appendix F) developed for the project follows those principles and would address the risk that increased injury or mortality to bats would result in population-level changes to the bat species in the region. Under the plan, a TAC would monitor SVWEF activities, including bat mortality data, to determine the need for project mitigations. The TAC would make recommendations to the BLM Authorized Officer on developing and implementing effective measures to monitor, avoid, and/or minimize impacts to bat species (see Appendix F:16–20). With the necessary data collected, the radar systems installed for the project would be used to trigger turbine shutdowns during high-risk periods for bats, specifically when high bat activity is observed at Rose Guano Bat Cave (see Appendix F:5–7). Other shutdown times may be used as phase mitigation allows (see Appendix F:16–20). Additionally, if mortality thresholds defined in the plan for overall bat species are exceeded, the TAC would be responsible for identifying and recommending suitable mitigation(s). Additionally, an initial

mitigation measure would implement cut-in speed increases (i.e., curtailment) during peak Brazilian free-tailed bat activity. This mitigation measure has been shown to greatly reduce bat mortality (53%–87%) when cut-in speeds of wind turbines are increased (Arnett et al. 2009; Baerwald 2008) during the fall migratory period. Although the measure is geared toward Brazilian free-tailed bats, it would likely indirectly reduce impacts to all bat species. If bat mortality is recorded over the threshold, the BLM authorized office is able to require increases in the utilization of curtailment as described in Appendix F, pages 16 to 20.

Workforce presence. Because bats are likely to be present in the project area at times when human activity is not occurring, and because of the low amounts of human activity at other times that are projected to occur throughout the project area during long-term operation, bats would not be affected by the increased levels of human activity associated with maintenance and operation of the SVWEF.

Interference with behavioral activities. The introduction of WTGs and associated facilities is expected to result in small, local changes in migratory movements as bats fly over or around the new structures, continuing on their path, but would not result in regional changes to migratory movements. There are no known effects on bat behavior from the presence of MERLIN or VESPER radar systems. Impacts to the migratory movements of the Brazilian free-tailed bat are described in Section 4.3.2.6, Special-status Species.

4.2.3 Alternate Development Alternative

The effects of the Alternate Development Alternative on general wildlife species would be similar in nature to those described under the Proposed Action. The Alternate Development Alternative includes the same facilities and the same number of WTGs and follows the same construction methods and timeline. However, the size of the project area is reduced to 7,673 acres, and the 75 WTG locations have been selected to avoid resource issues, including important wildlife resources. The following criteria related to wildlife and wildlife habitat were applied in selecting the alternative WTG sites and associated infrastructure:

- At least 0.5 mile from recorded active raptor nests;
- At least 0.5 mile from open water sources;
- Outside occupied and high-quality pygmy rabbit habitat; and
- At least 2 miles from active sage-grouse leks.

In addition, there would be fewer short- and long-term surface disturbances associated with the roads and collection system of the Alternate Development Alternative. The following sections describe only the exceptions to impacts described under the Proposed Action.

4.2.3.1 REPTILES AND AMPHIBIANS

4.2.3.1.1 Construction

Habitat disturbance. During construction, there would be short-term disturbance to 325.4 acres of habitat for the Great Basin spadefoot toad and all of the reptiles identified in Section 3.2.1, which represents 4.2% of total habitat within the Spring Valley. Temporary use areas would be reclaimed after construction and would result in negligible impacts. Long-term disturbance areas would include wind turbine pads, O&M building, access road footprints, and associated infrastructure. Total long-term disturbance would include 104.7 acres of habitat, or 1.4% of the project area, which would be a negligible impact. As part of the Proposed Action, all wetland areas would be avoided; therefore, no direct impacts to amphibian breeding habitat are expected.

Erosion and runoff. Changes in surface water quality would result in reduced reproductive success of amphibians using on-site surface waters. Because the effects would be localized to surface waters receiving increased site runoff in the project area and the Alternate Development alternative would exclude construction activities within 0.5 mile of existing surface waters in the project area, the risk of increased erosion and runoff affecting surface water quality would be less than under the Proposed Action.

4.2.3.1.2 Operation and Maintenance

Decreased aquatic habitat quality. Increased erosion and runoff would result from the increase in impermeable surfaces in the project area. Erosion and runoff would result in reduced aquatic habitat quality. Because the effects would be localized to surface waters receiving increased site runoff in the project area and the Alternate Development alternative would exclude construction activities within 0.5 mile of existing surface waters in the project area, the risk of increased erosion and runoff affecting surface water quality would be less than under the Proposed Action.

4.2.3.2 SMALL MAMMALS

4.2.3.2.1 Construction

Habitat disturbance. Impacts to small mammals from construction of the Alternate Development Alternative would be similar to those described for the Proposed Action. During construction, there would be short-term disturbance to 325.4 acres of small-mammal habitat, which represents 4.2% of the project area. Temporary use areas would be reclaimed after construction. Long-term disturbance areas would include wind turbine pads, the O&M building, access road footprints, and associated infrastructure. Total long-term disturbance would include 104.7 acres of habitat, or 1.4% of the project area.

Erosion and runoff. Drinking water supplies would be impacted as a result of changes in surface water quality in the project area. Because the effects would be localized to surface waters receiving increased site runoff in the project area and the Alternate Development alternative would exclude construction activities within 0.5 mile of existing surface waters in the project area, the risk of increased erosion and runoff affecting drinking water supplies for small mammals would be less than under the Proposed Action.

4.2.3.2.2 Operation and Maintenance

Impacts to small mammals from the operation and maintenance of the SVWEF under the Alternate Development Alternative are expected to be the same as those identified for the Proposed Action.

4.2.3.3 BIG-GAME SPECIES

4.2.3.3.1 Construction

Impacts to big-game species from construction of the Alternate Development Alternative would be similar to those described for the Proposed Action. However, impacts to pronghorn habitat would be reduced based on the smaller overall project footprint. Pronghorn would be displaced from the project area for approximately 9 to 12 months during construction. All 7,673 acres should be considered an effective loss of habitat during construction, which equates to a 1.3% loss of available habitat in Spring Valley and no loss of crucial wintering habitat. Permanent removal of 104.7 acres of habitat under the Alternate Development Alternative would represent a loss of only 0.02% of the available habitat in Spring Valley.

4.2.3.3.2 Operation and Maintenance

Impacts to big-game species from the operation and maintenance of the SVWEF under the Alternate Development Alternative are expected to be the same as those identified for the Proposed Action.

4.2.3.4 WATERFOWL AND SHOREBIRDS

4.2.3.4.1 Construction

Because open water sources would be avoided by at least 0.5 mile, the intensity of both direct and indirect impacts described under the Proposed Action would be reduced. Direct mortality from construction equipment would be unlikely because of the distance from water sources used by waterfowl and shorebirds. The potential for erosion and runoff to impact wetland area would be negligible because of the distance runoff would have to travel to enter wetlands and because of implementation of BMPs. Noise levels at wetland areas would be reduced from 42–46 to 37–45 dBA.

4.2.3.4.2 Operation and Maintenance

Impacts from collisions of waterfowl and shorebirds with WTGs are expected to be lower under the Alternate Development Alternative because WTGs would be placed farther away from the preferred habitat for these species.

4.2.3.5 SONGBIRDS

4.2.3.5.1 Construction

Because open water sources would be avoided by at least 0.5 mile and many songbirds aggregate new open water, the intensity of both direct and indirect impacts described under the Proposed Action would be reduced.

4.2.3.5.2 Operation and Maintenance

Collision with turbines, towers, and transmission lines. Impacts from collisions of songbirds with WTGs are expected to be lower under the Alternate Development Alternative because WTGs would be placed farther away from wetland areas where songbirds are more abundant.

Interference with behavioral activities. As discussed under the impacts analysis for the Proposed Action, songbird density would be reduced within 80 m of a WTG, which would affect 372.6 acres of habitat. This equates to a reduction in habitat quality for 0.1% of general songbird habitat in Spring Valley.

4.2.3.6 BIRDS OF PREY AND VULTURES

4.2.3.6.1 Construction

Interference with behavioral activities. Four nests that could be used by raptors are known to occur in the Proposed Action APE, including one Swainson's hawk nest that was active in 2007. Under the Alternate Development Alternative, construction activities would not occur within 0.5 mile of these raptor nests or within 0.5 mile of existing surface waters. The nearest recorded ferruginous hawk nest would be more than 1 mile from the closest WTG, consistent with USFWS guidelines for the species.

4.2.3.6.2 Operation and Maintenance

Collision with turbines, towers, and transmission lines. WTGs would not be located within 0.5 mile of active raptor nests or surface waters. This would reduce the risk of injury or mortality of raptors from collision with WTGs. Additionally, as described under the Proposed Action, each year prior to the onset of the migratory bird breeding season (March 15–July 30), and once each month during the season, raptor nest surveys would be completed to identify active nests within 0.5 mile of a turbine. If a nest is found to be in use, the TAC would determine necessary action based on the ABPP (see Appendix F). Although injury or mortality of individual raptors is still anticipated to occur under the Alternate Development Alternative, WTG site selection, nest surveys, and implementation of the ABPP would address the risk that increased injury or mortality would result in population-level changes to the raptor species in the region.

4.2.3.7 BATS

4.2.3.7.1 Construction

Because open water sources would be avoided by at least 0.5 mile and bat activity is generally concentrated near open water (SWCA 2009a), the intensity of both direct and indirect impacts described under the Proposed Action would be reduced.

4.2.3.7.2 Operation and Maintenance

The Alternate Development Alternative would modify wind turbine arrangement in order to buffer water resources by at least 0.5 mile, which would result in the exclusion of all surface water resources from the project area. Since bat activity is known to be higher near water resources (SWCA 2009a), the intensity of both direct and indirect impacts described under the Proposed Action would be reduced. Although injury or mortality of individual bats is still anticipated to occur under the Alternate Development Alternative, WTG site selection, and implementation of the ABPP would address the risk that increased injury or mortality would result in population-level changes to bat species in the region.

4.2.4 No-Action Alternative

Under the No-Action Alternative, the SVWEF ROW application would be denied, and current land uses would continue. Under the No-Action Alternative, wildlife species that are currently in the project area would continue to use the habitat. The infrequent disturbances that result from current land uses would continue under the No-Action Alternative. The impacts to wildlife from those disturbances would continue to affect wildlife individuals, but populations would remain unaffected.

4.3 Special-Status Species

This section discusses impacts to special-status species from the construction and operation of the SVWEF. Both indirect and direct impacts are analyzed for special-status species and their habitats. Wherever possible, impacts are discussed in quantifiable terms.

4.3.1 Programmatic Environmental Impact Statement Impacts Summary

Potential impacts to special-status species from a typical wind energy facility are not explicitly described in the PEIS. However, the PEIS states, “Construction activities could affect threatened, endangered, and sensitive species in the same manner that vegetation, wildlife, and aquatic resources could be affected”

(BLM 2005:5-49). Therefore, PEIS impacts described for wildlife (Section 4.2.1) apply to special-status species. Gallinaceous birds and vegetation were not covered in Section 4.2.1 and are therefore described in this section. A summary of the related mitigation measures that have been fully analyzed in the PEIS for these species is provided in Section 6.2 of this EA. The impacts and mitigation measures analyzed and described for the PEIS are herein incorporated into this document.

4.3.1.1 GALLINACEOUS BIRDS

4.3.1.1.1 Construction

In general, impacts described in the PEIS (Section 4.2.1 of this EA) for other bird species apply to gallinaceous birds. Specific to the greater sage-grouse, the PEIS states that site construction could be a source of auditory and visual disturbance that could cause them to avoid traditional use areas and reduce use of leks (BLM 2005; Young et al. 2003). Disturbance during construction also appears to limit reproduction opportunities and result in regional population declines (BLM 2005).

4.3.1.1.2 Operation and Maintenance

The PEIS states that site operation could also be a source of auditory and visual disturbance that could cause them to avoid traditional use areas and reduce use of leks (BLM 2005; Young et al. 2003). Additionally, disturbance during construction appears to limit reproduction opportunities and result in regional population declines (BLM 2005).

WTGs and infrastructure (transmission lines and access roads) may adversely affect habitats important to gallinaceous birds by causing fragmentation, reducing habitat value, or reducing the amount of habitat available (Braun 1998). WTGs and other structures can also provide perches and nesting areas for raptors and ravens that may prey on sage-grouse (BLM 2005).

4.3.1.2 VEGETATION

4.3.1.2.1 Construction

While the PEIS does not describe impacts to Parish phacelia, construction-related impacts to vegetation in Section 5.9.2.1 would be applicable to this special-status plant species. These impacts include direct mortality resulting from site clearing and grading and construction activities. Increased levels of fugitive dust resulting from construction activities may result in decreased photosynthesis, loss of cuticular wax on leaves, and decreased plant productivity. Exposure to contaminants resulting from refueling equipment may slow re-establishment of vegetation in disturbed areas. The introduction of noxious and invasive vegetation resulting from site clearing and grading could result in the displacement of native plants.

4.3.1.2.2 Operation and Maintenance

Operation-related impacts to vegetation in Section 5.9.3.1 would be applicable to Parish phacelia. Site maintenance activities that include mowing vegetation and application of herbicides may prevent re-establishment and natural succession of plant communities. Exposure to contaminants (fuels, pesticides, hazardous waste) may impact localized areas where spills occur.

Vegetation may be indirectly impacted from OHV use, site use, and illegal dumping as a result of increased access to BLM lands. Legal and illegal take of plants may result from increased access to BLM lands. Introduction of invasive vegetation may occur through OHV and hiking use, Greater human activity may also result in increased risk of wildfire through campfires, OHV use, and cigarettes.

4.3.2 Proposed Action

4.3.2.1 SMALL MAMMALS

Impacts to pygmy rabbits resulting from implementation of the Proposed Action would be similar to those impacts to small mammals described in the wildlife section (4.2.2.2). However, because pygmy rabbit habitat is limited in its distribution, the frequency of impacts would be lower; conversely, the sensitive nature of the species means that impacts would have an increased intensity.

4.3.2.1.1 Construction

Habitat disturbance. Under the Proposed Action, three turbine locations and associated infrastructure would result in the long-term removal of 0.29 acre (0.71%) of high -quality or occupied pygmy rabbit habitat. Additionally, construction activities would result in the long-term removal of 35.6 acres (1.1%) of potential pygmy rabbit habitat and short-term disturbance of an additional 139.7 acres (3.8%) of potential pygmy rabbit habitat. The 139.7 acres would be reclaimed following construction; but could take an estimated 10 years before the short-term disturbance areas are successfully reclaimed (see Appendix A). Even when vegetation is established following reclamation efforts, the composition of species and structure of plants in the recovery area are often different from the original plant community. Restoration would be less effective for pygmy rabbits because they prefer tall, decadent stands of sagebrush, which take years to establish, but it would provide some cover and forage. Therefore, even with restoration activities, the loss of occupied and high-quality habitat and potential habitat could lead to local population decreases because pygmy rabbits require specific habitat characteristics that limit available areas to colonize. Regional population levels are not expected to be affected because of the small amount of habitat loss relative to the Spring Valley watershed (0.01%). In addition, the Proposed Action includes sagebrush restoration and enhancement activities (see Section 2.1.5 and Appendix A), which would make new habitat available and/or increase the quality of existing habitat for pygmy rabbit.

All other impacts to pygmy rabbit would be the same as those described for small mammals (see Section 4.2.2.2).

4.3.2.1.2 Operation and Maintenance

All operation and maintenance impacts to pygmy rabbit would be the same as described for small mammals (see Section 4.2.2.2).

4.3.2.2 WATERFOWL AND SHOREBIRDS

Impacts to long-billed curlew, sandhill crane, and willet resulting from implementation of the Proposed Action would be similar to those impacts to waterfowl and shorebirds described in the wildlife section (4.2.2.4). However, because long-billed curlew, sandhill crane, and willet have lower site use, the frequency of impacts would be lower; conversely, the sensitive nature of the species means that impacts would have an increased intensity.

4.3.2.2.1 Construction

Construction-related impacts to long-billed curlew, sandhill crane, and willet resulting from implementation of the Proposed Action would be the same as those impacts to waterfowl and shorebirds described in the wildlife section (4.2.2.4).

4.3.2.2.2 Operation and Maintenance

Collision with turbines, towers, and transmission lines. Impacts from the routine operation and maintenance of the SVWEF would be similar to those described in the wildlife section (4.2.2.2). WTGs installed near (less than 0.5 mile) water sites where higher activity was observed would have an increased potential for waterfowl and shorebird strikes. Because of their low representation during project area surveys, injury or mortality of sandhill cranes and willets from collisions with WTGs, towers, and transmission lines are expected to be rare.

Although long-billed curlews have never been recorded as a mortality at any wind energy facility, because of their more frequent representation during project area surveys, and observation of their presence in the RSA, occurrences of injury or mortality of long-billed curlews from collisions with WTGs, towers, and transmission lines are expected to occur and to be more frequent than those of sandhill cranes and willets. To further address impacts to special-status waterfowl, the ABPP (see Appendix F) provides measures to adaptively manage impacts as they are determined through monitoring. Under the plan, a TAC would monitor SVWEF activities, including species specific mortality data, to determine the need for project mitigations. The TAC would make recommendations to the BLM Authorized Officer on developing and implementing effective measures to monitor, avoid, and/or minimize impacts to special-status waterfowl and shorebirds species. With the necessary data collected, the radar systems installed for the project would be used to trigger turbine shutdowns during high-risk periods for birds, specifically when high avian activity is coupled with low visibility (see Appendix F:5–7). Although injury or mortality of individual special-status waterfowl and shorebirds is expected to occur as a result of the presence of WTGs, towers, and transmission line, species-specific mortality thresholds for long-billed curlews, sandhill cranes, and willets have been developed in the ABPP (see Appendix F:Table 4) to address the higher potential for population-level impacts to those species and reduce the risk that increased injury or mortality would result in local or regional population-level changes. Phased mitigation has not been proposed for specific species because it is currently unknown whether or which species would exceed mortality thresholds. Therefore, if species-specific thresholds are exceeded, the TAC would determine what mitigation, if any, should be recommended for implementation, and the BLM Authorized Officer would approve the measure if determined appropriate. Mitigation may include development of a phased approach for the species similar to the mitigation approach for general birds and bats.

4.3.2.3 SONGBIRDS

4.3.2.3.1 Construction

Impacts to special-status songbirds are expected to be the same as those described for songbirds in the wildlife section of this document (see Section 4.2.2.5). To reduce impacts associated with direct mortality and displacement of nesting birds during construction, construction activities should be restricted during nesting season, as identified in Section 5.9.5.3.2 of the PEIS.

Habitat disturbance. There were eight species of special-status songbirds observed during avian studies (see Table 3.2-2), and each species could nest in the project area. While the overall loss of habitat described for migratory birds would be the same as those for birds of conservation concern, their association with specific habitat types means they would realize differing levels of long-term impacts from the loss of their preferred habitat. Juniper titmouse, pinyon jay, and red-naped sapsucker all prefer nesting in pinyon-juniper habitat, and none would be removed as a result of the Proposed Action. Sage thrasher, Brewer’s sparrow, vesper sparrow, loggerhead shrike, and sage sparrow prefer sagebrush and mixed desert scrub habitat, and there would be 39.6 acres removed.

4.3.2.3.2 Operation and Maintenance

Collision with turbines, towers, and transmission lines. In general, impacts from the routine operation and maintenance of the SVWEF would be the same as those described in the wildlife section (4.2.2.2). Because of their low representation during project area surveys both in the project area and through the RSA, injury or mortality of brewer's sparrow, pinyon jay, vesper sparrow, sage sparrow and red-naped sapsucker from collisions with WTGs, towers, and transmission lines are expected to be a rare occurrence at the SVWEF.

Because of their more frequent representation during project area surveys, and observation of their presence in the RSA, occurrences of injury or mortality of loggerhead shrikes from collisions with WTGs, towers, and transmission lines are expected to occur and to be more frequent than the other special-status songbirds.

To further address impacts to special-status songbirds, the ABPP (see Appendix F) provides measures to adaptively manage impacts as they are determined through monitoring. Under the plan, a TAC would monitor SVWEF activities, including special-status songbird specific mortality data, to determine the need for project mitigations. The TAC would make recommendations to the BLM Authorized Officer on developing and implementing effective measures to monitor, avoid, and/or minimize impacts to special-status songbird species. With the necessary data collected, the radar systems installed for the project would be used to trigger turbine shutdowns during high-risk periods for birds, specifically when high avian activity is coupled with low visibility (see Appendix F:5–7). Although injury or mortality of individual special-status songbirds is expected to occur as a result of the presence of WTGs, towers, and transmission line, species-specific mortality thresholds for special-status songbirds have been developed and are included in the ABPP (see Appendix F) to address the higher potential for population impacts to those species and reduce the risk that increased injury or mortality would result in local or regional population-level changes. Phased mitigation has not been proposed for specific species because it is currently unknown whether or which species would exceed mortality thresholds. Therefore, if species-specific thresholds are exceeded, the TAC would determine what mitigation, if any, should be recommended for implementation, and the BLM Authorized Officer would approve the measure if determined appropriate. Mitigation may include development of a phased approach for the species similar to the mitigation approach for general birds and bats.

4.3.2.4 GALLINACEOUS BIRDS

Impacts to greater sage-grouse resulting from implementation of the Proposed Action would be similar to impacts to all birds described in the wildlife section (4.2.2.5). However, the sensitive nature of the species means that impacts would have an increased intensity.

4.3.2.4.1 Construction

Habitat disturbance. Construction activities would result in the short-term disturbance of 139.7 acres of sage-grouse habitat, which is 3.8% of total habitat within the project area. A Restoration and Weed Management Plan (see Appendix A), including post-construction reclamation of short-term disturbance areas for sage-grouse habitat. It could take up to 10 years before short-term disturbance areas are successfully reclaimed. Even when vegetation is established following reclamation efforts, the composition of species in the recovery area is often different from the original plant community. As a result, short-term disturbance areas would be a long-term impact because of the time required for successful recovery of the habitat.

Construction activities would also result in the long-term removal of 39.6 acres of habitat, or 1.1% of total habitat within the project area. This habitat disturbance would occur for the duration of the 30-year SVWEF and the subsequent 10 years for successful decommissioning and reclamation.

Interference with behavioral activities. In addition to the direct disturbance of sage-grouse habitat as a result of construction activities, disturbances to behavioral activities, including foraging, mating, and nesting, would result from construction activities during the 9- to 12-month construction period. Sage-grouse may avoid foraging, breeding behavior, or vacate sites entirely throughout the entire 8,565-acre project area and adjacent habitats during the 9- to 12-month construction phase. Some grouse may permanently abandon the disturbed areas and adjacent habitats.

The PEIS specifically includes suggested management practices (SMPs) for wind energy development, the conservation of sagebrush habitat, and management of sage-grouse (found in the text box titled Compatibility of a Wind Energy Development Project and Gallinaceous Birds, beginning on page 5-73) that would reduce impacts. Additionally, measures in the Proposed Action (see Section 2.1.4 above) and mitigation measures described in Chapter 6 below would be implemented to further reduce the potential for impacts.

4.3.2.4.2 Operation and Maintenance

The operations phase of the Proposed Action would have similar impacts to greater sage-grouse as described in Section 5.9.3.2 of the PEIS (incorporated by reference) for a typical wind energy project in sage-grouse habitat. These impacts include increased predation and interference with behavioral activities.

Predation. The 400-foot-long overhead 230-kV connector transmission line connecting the Spring Valley substation to the Osceola switching station onto the NV Energy 230-kV transmission line is the only aboveground transmission line. Because the current NV Energy 230-kV line provides numerous transmission line poles, perch sites are not a limiting factor in the area; therefore, there would be a negligible increase in predation of sage-grouse along the new line throughout the 30-year duration of the SVWEF.

Interference with behavioral activities. Changes to the behavioral activities of greater sage-grouse, including foraging, nesting, and lek activity would result from the presence of WTGs and associated facilities in the project area. Greater sage-grouse are expected to avoid areas of up to 2 miles surrounding WTGs, towers, and transmission lines. This 38,289-acre avoidance area includes the additional Bastian Creek and Majors allotment fence lines northeast of the project area and would be 9% of available greater sage-grouse habitat in Spring Valley, throughout the 30-year duration of the SVWEF. Conversely, the Proposed Action includes sagebrush restoration and enhancement activities (see Section 2.1.5 and Appendix A), which would make new habitat available and/or increase the quality of existing habitat for greater sage-grouse. Additionally, two turbine sites would be located within 2 miles of the Bastian Creek lek, and if installed, there would be an increased potential to disturb sage-grouse and cause a decrease in lek success or even lek abandonment. Because there is currently an existing road and distribution line separating the lek from the project area, there would be a minor increase in the risk of lek abandonment as a result of the Proposed Action.

The SMPs in the PEIS that describe management efforts for the conservation of sagebrush habitat would also help reduce impacts to sage-grouse during operation. Also, measures identified as part of the Proposed Action (see Section 2.1.4) and mitigation measures described in Chapter 6 of this EA would reduce impacts to sage-grouse, in particular those that would result from turbine placement.

4.3.2.5 BIRDS OF PREY

Anticipated impacts to special-status birds of prey resulting from implementation of the Proposed Action would be similar to those impacts to birds of prey and vultures described in the wildlife section (4.2.2.6). However, because of their generally low numbers and protected status, impacts would have an increased intensity.

4.3.2.5.1 Construction

Turbines located within 0.5 mile of known raptor nests and would increase the potential for temporary displacement during the 9- to 12-month construction phase, if a breeding pair attempts to use one of these nests.

4.3.2.5.2 Operation and Maintenance

Collision with turbines, towers, and transmission lines. In general, impacts from the routine operation and maintenance of the SVWEF would be the same as those described in the wildlife birds of prey and vultures section (4.2.2.6). Because of their low representation during project area surveys both in the project area and through the RSA, injury or mortality of golden and bald eagles is expected to be a rare occurrence at the SVWEF.

Prairie falcons, northern harriers, and western burrowing owls were all observed in the project area, and injury or mortality from collisions with WTGs, towers, and transmission lines is expected to occur. Because of their more frequent representation during project area surveys, observation of their presence in the RSA, and nearby nests, occurrences of injury or mortality of ferruginous hawks and Swainson's hawks, in particular juveniles of these species, from collisions with WTGs, towers, and transmission lines are expected to occur and to be more frequent than the other special-status birds of prey. Although not observed on surveys, the peregrine falcon has been recorded in Spring Valley and would be expected to be a rare visitor to the area, and injury or mortality from collisions with WTGs, towers, and transmission lines may be expected to occur.

To address impacts to special-status raptors, the ABPP (see Appendix F) provides measures to adaptively manage impacts as they are determined through monitoring. Under the plan, a TAC would monitor SVWEF activities, including special-status birds of prey mortality data, to determine the need for project mitigations. The TAC would make recommendations to the BLM Authorized Officer on developing and implementing effective measures to monitor, avoid, and/or minimize impacts to special-status birds of prey. With the necessary data collected, the radar systems installed for the project would be used to trigger turbine shutdowns during high-risk periods for birds, specifically when high avian activity is coupled with low visibility (see Appendix F:5–7). Although injury or mortality of individual special-status birds of prey is expected to occur as a result of the presence of WTGs, towers, and transmission line, species-specific mortality thresholds for special-status birds of prey have been developed in the ABPP (see Appendix F) to address the higher potential for population impacts to those species. Phased mitigation has not been proposed for specific species because it is currently unknown whether or which species would exceed mortality thresholds. Therefore, if species-specific thresholds are exceeded, the TAC would determine what mitigation, if any, should be recommended for implementation, and the BLM Authorized Officer would approve the measure if determined appropriate. Mitigation may include development of a phased approach for the species similar to the mitigation approach for general birds and bats. Implementation of the ABPP (see Appendix F) would address the risk that increased injury or mortality would result in local or regional population-level changes.

4.3.2.6 BATS

Impacts from the routine operation and maintenance of the SVWEF would be similar to those described in the wildlife bats section (4.2.2.7). However, because of their protected status, impacts would have a greater intensity.

4.3.2.6.1 Construction

All construction impacts to special-status bat species would be the same as described for bats in section 4.2.2.7.

4.3.2.6.2 Operation and Maintenance

Collision with turbines, towers, and transmission lines. Pallid bat and Townsend's big-eared bat forage in and among vegetation (Bradley et al. 2006), indicating that they may spend less time in the RSA relative to other special-status bat species. Additionally, neither species has been a previously reported mortality at other wind energy facilities (Arnett et al. 2008; BLM 2005). Injury or mortality from barotraumas or collisions with WTGs, towers, and transmission lines is expected to be an infrequent occurrence for both species.

Brazilian free-tailed bats are the most common migratory special-status bat species observed in the project area. Previous research indicates that migratory bat species are most susceptible to mortality resulting from turbine collisions and/or barotrauma (Arnett et al. 2009; Baerwald 2009) and that mortality rates of these species are generally highest during the fall migration (Arnett et al. 2008; Baerwald 2009). Injury or mortality of Brazilian free-tailed bats from turbine collisions and barotrauma is expected to occur during the fall migration period. Curtailment of turbines during peak activity of Brazilian free-tailed bats as described in the ABPP is anticipated to reduce the risk of injury or mortality from barotrauma or collision with WTGs. The BLM would implement cut-in speed curtailment for up to 744 hours per year (i.e., the equivalent of 62 days per year, 12 hours per day). Additional adjustments to seasonal and daily timing may be made based on mortality data, radar, and AnaBat data. Altering turbine cut-in speed has been shown to dramatically reduce impacts (50%–87%) to other bat species at wind energy facilities (Arnett et al. 2009; Baerwald 2009).

Western red bats have been shown to be adversely impacted at wind energy facilities (Arnett et al. 2008; BLM 2005). As a result of the low activity of this species observed in the project area, injury or mortality from barotrauma or collisions with WTGs, towers, and transmission lines is expected to be a rare occurrence. Additionally, the turbine cut-in speed changes during peak Brazilian free-tailed bat periods provide de facto mitigation for the western red bat, as impacts to migratory tree-roosting bat are greatest in the fall (Arnett et al. 2008; BLM 2005), the same period when the turbine cut-in experiment would occur.

To further address impacts to special-status bats, the ABPP (see Appendix F) provides additional measures to adaptively manage impacts as they are determined through monitoring. Under the plan, a TAC would monitor SVWEF activities, including special-status bat species specific mortality data, to determine the need for project mitigations. The TAC would make recommendations to the BLM Authorized Officer on developing and implementing effective measures to monitor, avoid, and/or minimize impacts to special-status bats. With the necessary data collected, the radar systems installed for the project would be used to trigger turbine shutdowns during high-risk periods for bats, specifically when high bat activity is observed at Rose Guano Bat Cave (see Appendix F:5–7). Other shutdown times may be used as phase mitigation allows (see Appendix F:16–20). Although injury or mortality of individual special-status bats is expected to occur as a result of the presence of WTGs, towers, and transmission line, species-specific mortality thresholds for special-status bats have been developed in the

ABPP (see Appendix F) to reduce the higher potential for population-level impacts to those species and would address the risk that increased injury or mortality would result in local or regional population-level changes. Species-specific mortality thresholds identified in the plan would be used to identify trends in mortality of special-status bat species and trigger action by the TAC. Phased mitigation has not been proposed for specific species because it is currently unknown whether or which species would exceed mortality thresholds. Therefore, if species-specific thresholds are exceeded, the TAC would determine what mitigation, if any, should be recommended for implementation, and the BLM Authorized Officer would approve the measure if determined appropriate. Mitigation may include development of a phased approach for the species similar to the mitigation approach for general birds and bats. Preconstruction survey data would be used to identify seasonal activity patterns for special-status bat species (SWCA 2009a), which may then be used to determine the ideal time for implementing operational mitigation measures to target individual special-status species.

Interference with behavioral activities. The Rose Guano Cave ACEC is located approximately 4 miles northeast of the nearest proposed WTG in the project area. Rose Guano Cave is known as a roosting location for Brazilian free-tailed bats during the fall migration (Sherwin 2009). The PEIS states that migrating bats are "expected to simply fly around individual structures or around or over the facility site and continue their migratory movement" (BLM 2005). Consistent with the PEIS, the introduction of WTGs associated with the SVWEF may result in individual bat mortality; however, the large-scale migration movement of this population of Brazilian free-tailed bats would not change. Installation of an infrared beam bat detection system at the cave portal would result in long-term disturbance. The installation would include drilling 12 sensors into the perimeter of the cave portal. Installation would be completed outside the season when Brazilian free-tailed bats use Rose Guano Cave and would not impact their ingress or egress. Therefore, installation would have no measurable effect.

4.3.2.7 VEGETATION

Impacts to Parish phacelia would be consistent with vegetation impacts described in Sections 5.9.2.1 and 5.9.3.1 of the PEIS. The Proposed Action avoids areas of suitable habitat for Parish phacelia and no direct impacts to Parish phacelia would occur.

4.3.3 Alternate Development Alternative

4.3.3.1 SMALL MAMMALS

4.3.3.1.1 Construction

Impacts to pygmy rabbit from construction of the Alternate Development Alternative would be similar to those described under the Proposed Action. Under the Alternate Development Alternative, all mapped high-quality pygmy rabbit habitat would be avoided. As a result of the avoidance, there would be no direct loss of occupied or high-quality pygmy rabbit habitat. Construction activities would result in the long-term removal of 39.4 acres (1.1%) of potential pygmy rabbit habitat and short-term disturbance of 139.2 acres (4.0%) potential pygmy rabbit habitat as described under the Proposed Action. Reclamation of the short-term disturbance acreage would occur as described under the Proposed Action, but because of the specific habitat requirements of pygmy rabbits, this would remain a long-term loss of 4.0% of the potential habitat in the project area.

4.3.3.1.2 Operation and Maintenance

Impacts to small mammals from the operation and maintenance of the SVWEF under the Alternate Development Alternative are expected to be the same as those identified under the Proposed Action.

4.3.3.2 WATERFOWL AND SHOREBIRDS

4.3.3.2.1 Construction

Construction-related impacts to long-billed curlew, sandhill crane, and willet resulting from implementation of the Proposed Action would be similar to those impacts to waterfowl and shorebirds described in the wildlife section (4.2.2.4). Because no construction would occur within 0.5 mile of open water sources in the project area, the intensity of both direct and indirect impacts described under the Proposed Action would be reduced.

4.3.3.2.2 Operation and Maintenance

Impacts to special-status waterfowl and shorebirds from the operation and maintenance of the SVWEF under the Alternate Development Alternative would be similar to those identified under the Proposed Action. Under the Alternate Development Alternative, a 0.5-mile avoidance buffer around open water sources was established and no WTGs or infrastructure would be constructed within that buffer. By avoiding open water sources, the risk of injury or mortality from collisions of special-status waterfowl and shorebirds with WTGs are expected to be lower under the Alternate Development Alternative.

4.3.3.3 SONGBIRDS

4.3.3.3.1 Construction

Many of the impacts to special-status songbirds from construction of the Alternate Development Alternative would be same as those described for the Proposed Action. However, because open water sources would be avoided by at least 0.5 mile and many songbirds aggregate new open water, the intensity of both direct and indirect impacts described under the Proposed Action would be reduced.

4.3.3.3.2 Operation and Maintenance

Impacts to special-status songbirds from the operation and maintenance of the SVWEF under the Alternate Development Alternative are expected to be similar to those identified under the Proposed Action. However, impacts from collisions of songbirds with WTGs are expected to be reduced under the Alternate Development Alternative because WTGs would be placed farther away from wetland areas where songbirds are more abundant. As discussed under the Proposed Action, songbird density would be reduced within 80 m of a WTG, which would affect 372.62 acres of habitat. This equates to a reduction in habitat quality for 0.1 % of general songbird habitat in Spring Valley.

4.3.3.4 GALLINACEOUS BIRDS

4.3.3.4.1 Construction

Many of the impacts to greater sage-grouse from construction of the Alternate Development Alternative would be same as those described for the Proposed Action. However, impacts would be reduced because WTGs would be located further from active leks under the Alternate Development Alternative.

4.3.3.4.2 Operation and Maintenance

Impacts to greater sage-grouse during operation and maintenance of the SVWEF under the Alternate Development Alternative are expected to be similar to those identified under the Proposed Action. However, impacts would be reduced because WTGs would be located further from active leks under the Alternate Development Alternative.

4.3.3.5 BIRDS OF PREY

4.3.3.5.1 Construction

Many of the impacts to special-status birds of prey from construction of the Alternate Development Alternative would be same as those described under the Proposed Action. Because raptor nests and open water sources would be avoided by at least 0.5 mile, the intensity of both direct and indirect impacts described under the Proposed Action would be reduced.

4.3.3.5.2 Operation and Maintenance

Impacts to special-status birds of prey during operation and maintenance of the SVWEF under the Alternate Development Alternative would be similar to those identified under the Proposed Action and in the wildlife section, birds of prey and vultures. WTGs would not be located within 0.5 mile of active raptor nests or surface waters. This would reduce the risk of injury or mortality of raptors from collision with WTGs. Although injury or mortality of individual raptors is still anticipated to occur under the Alternate Development Alternative, WTG placement away from nests, nest surveys and associated mitigation, and implementation of the ABPP would further reduce the risk that increased injury or mortality would result in population-level changes to the raptor species in the region.

4.3.3.6 BATS

4.3.3.6.1 Construction

Because open water sources would be avoided by at least 0.5 mile and bat activity is generally concentrated near open water (SWCA 2009a), the intensity of both direct and indirect impacts described under the Proposed Action would be reduced.

4.3.3.6.2 Operation and Maintenance

The Alternate Development Alternative would modify wind turbine arrangement in order to buffer water resources by at least 0.5 mile. Because bat activity is known to be higher near water resources (SWCA 2009a), the risks of injury or mortality of special-status bats from collisions or barotraumas during foraging activities would be reduced from those described under the Proposed Action. Although injury or mortality of individual special-status bats is still expected to occur under the Alternate Development Alternative, WTG site selection, and implementation of the ABPP would reduce the risk that increased injury or mortality would result in population-level changes to bat species in the region.

4.3.3.7 VEGETATION

4.3.3.7.1 Construction

Construction impacts to Parish phacelia resulting from development of the Alternate Development Alternative would generally be the same as those described under the Proposed Action in Section 4.3.2.7. However, the Alternate Development Alternative would buffer spring locations by at least 0.5 mile. Therefore, potential habitat for Parish phacelia would be buffered by a greater distance, further reducing the potential for indirect impacts.

4.3.3.7.2 Operation and Maintenance

Operation and maintenance impacts to Parish phacelia resulting from development of the Alternate Development Alternative would generally be the same as those described under the Proposed Action in

Section 4.3.2.7. However, the Alternate Development Alternative would buffer spring locations by at least 0.5 mile. Therefore, potential habitat for Parish phacelia would be buffered by a greater distance, further reducing the potential for indirect impacts.

4.3.4 No-Action Alternative

Under the No-Action Alternative, the SVWEF ROW application would be denied and current land uses would continue. Under the No-Action Alternative, special-status wildlife species that are currently in the project area would continue to use the habitat. The infrequent disturbances that result from current land uses would continue under the No-Action Alternative. The impacts to special-status wildlife species from those disturbances would continue to affect individuals, but local and regional populations would remain unaffected.

4.4 Grazing

4.4.1 Programmatic Environmental Impact Statement Impacts

Although the types of changes to grazing that may result from the construction and operation of a typical wind energy facility are not specifically described in the PEIS, Sections 5.9.2.1 and 5.9.2.2 of the PEIS (BLM 2005) identify the types of impacts that may affect vegetation and wildlife resources. Additionally, Section 5.10.1 of the PEIS states that wind energy is generally compatible with other land uses, including grazing. Because this EA tiers to the PEIS analysis, a brief summary of those impacts to that are relevant to the Proposed Action and alternative action is presented below. A summary of the related mitigation measures for grazing that have been fully analyzed in the PEIS is provided in Section 6.2 of this EA. The impacts and mitigation measures analyzed and described for the PEIS are herein incorporated into this document.

4.4.1.1 CONSTRUCTION

The following impacts described for vegetation and wildlife resources are assumed to be applicable to grazing resources and include injury or mortality to vegetation, increased fugitive dust, exposure (of livestock) to contaminants, introduction of invasive vegetation, habitat reduction, alteration, or fragmentation, injury or mortality of wildlife (livestock), decrease in water quality from erosion and runoff, noise, and interference with behavioral activities.

4.4.1.2 OPERATION AND MAINTENANCE

The following impacts described for vegetation and wildlife resources are assumed to be applicable to grazing resources and would occur as a result of site maintenance activities involving mowing and herbicide use and accidental releases of pesticides, fuels, or hazardous materials.

Indirect impacts resulting from public use of newly developed roads may also affect grazing through direct injury to vegetation, legal and illegal take of plants, introduction of invasive vegetation, and increased potential for fire.

4.4.2 Proposed Action

4.4.2.1 CONSTRUCTION

Construction activities would result in the short-term disturbance of 76.5 acres within the Majors Allotment, reducing acres available for grazing in the allotment by 0.08%. Construction activities would

result in the short-term disturbance of 260.4 acres within the Bastian Creek Allotment, reducing acres available for grazing in the allotment by 1.9%. The area impacted in the Bastian Creek Allotment would include 427.9 acres located within the Bastian Creek treatment area. There would be no reduction in AUMs as a result of the Proposed Action. Livestock would be kept off the temporary disturbance areas during the restoration period by the additional fencing. Although construction activities are expected to last 9 to 12 months, it could take up to 10 years before temporary disturbance areas are successfully reclaimed (see Appendix A). Even when vegetation is established following reclamation efforts, the composition of species in the recovery area is often different from the original plant community, which could result in the diminished quality of available forage.

Construction activities would result in the long-term removal of 111.5 acres available for grazing, necessary for the wind turbine pads, the O&M building, access road footprints, and associated infrastructure. These losses would include 19.4 acres within the Majors Allotment, reducing available forage by 0.02%. A total of 91.7 acres within the Bastian Creek Allotment would be removed, reducing the available forage by 0.68% within the Bastian Creek Allotment, 8.6 acres of which occur in the Bastian Creek treatment area. This loss of acres available for grazing would occur for the duration of the 30-year SVWEF and the subsequent 10 years anticipated for successful decommissioning and reclamation. There would be no loss of AUMs as a result of the Proposed Action. Table 4.4-1 summarizes the impacts to these grazing allotments.

Table 4.4-1. Grazing Impacts

Allotment	Short-Term Acreage Lost (% of allotment lost)	Long-Term Acreage Loss
Bastian Creek	260.4 (1.9%)	91.7 (0.68%)
Majors	76.5 (0.08%)	19.4 (0.02%)

The Proposed Action would result in reduced forage quality from the spread of existing invasive vegetation and the introduction of new species of invasive vegetation. Invasive vegetation degrades quality forage in several ways. Weeds outcompete most native plants and can lead to a homogeneous vegetative landscape. Weedy habitats often contain fewer highly nutritious forage species for grazers. The potential for invasive vegetation that is currently occurring in Spring Valley to spread, and for new invasive species to be introduced, would be highest along the linear features of Proposed Action, the roads, and collection system. Additionally, within the Bastian Creek allotment, an existing treatment area would be more vulnerable, as this area has been recently disturbed. Reclamation of temporarily impacted areas would occur at the completion of the project and would be effective at reducing the establishment of noxious and invasive plant species.

Measures for reducing the spread and establishment of noxious and invasive weeds are included as part of the Restoration and Weed Management Plan in Appendix A. Implementation of measures identified in the plan would reduce the risk of spreading invasive vegetation currently occurring in Spring Valley, as well as reducing the risk of introducing new invasive species from locations with known invasive vegetation problems.

4.4.2.2 OPERATION AND MAINTENANCE

Operation and maintenance activities under the Proposed Action would result in increased ambient noise levels and increased human presence within the project area. The increased noise from the operation of WTGs may lead to intermittent disruptions in the behavior of cattle and sheep when wind levels are highest.

Because of the low amounts of human activity throughout the project area during the long-term operation of the SVWEF, cattle and sheep are expected to use available forage within and adjacent to the project area following construction and restoration.

4.4.3 Alternate Development Alternative

The effects of the Alternate Development Alternative on grazing would be similar in nature to those described under the Proposed Action. The Alternate Development Alternative includes the same facilities and the same number of WTGs and follows the same construction methods and timeline. However, the project area is reduced in size to 7,673 acres, and the 75 WTG locations are different from the Proposed Action. In addition, there would be fewer short-term and long-term surface disturbances associated with the roads and collection system of the Alternate Development Alternative. The following sections describe only the exceptions to impacts described under the Proposed Action.

4.4.3.1 CONSTRUCTION

Construction activities would result in the short-term disturbance of 77.5 acres of available forage within the Majors Allotment, reducing acres available for grazing in the allotment by 0.08%. Construction activities would result in the short-term disturbance of 248.0 acres available for grazing within the Bastian Creek Allotment, reducing available forage in the project area by 1.8%. The area impacted in the Bastian Creek Allotment would include 28.3 acres located within the Bastian Creek treatment area.

Construction activities would result in the long-term removal of 104.7 acres of acres available for grazing for the wind turbine pads, the O&M building, access road footprints, and associated infrastructure. These losses would include 18.2 acres within the Majors Allotment, reducing acres available for grazing by 0.02%. A total of 86.5 acres within the Bastian Creek Allotment would be removed reducing acres available for grazing by 0.64% within the allotment, 6.6 acres of which occur in the Bastian Creek treatment area. Impacts are summarized below in Table 4.4-2.

4.4.3.2 OPERATION AND MAINTENANCE

Because the operation and maintenance activities associated with the Alternate Development Alternative would be the same as described under the Proposed Action, the direct long-term impacts to grazing as a result of implementation of the Alternate Development Alternative would be the same as those described for the Proposed Action.

Table 4.4-2. Grazing Impacts

Allotment	Short-term Acreage Lost (% of allotment lost)	Long-term Acreage Loss (% of allotment lost)
Bastian Creek	248.0 (1.8%)	86.5 (0.64%)
Majors	77.5 (0.08%)	18.2 (0.02%)

4.4.4 No-Action Alternative

Under the No-Action Alternative, the two allotments would continue to be grazed in accordance with the *Fundamentals of Rangeland Health and Standards and Guidelines for Grazing for Nevada's Northeastern Great Basin Area* (43 CFR 4180, Appendix C:Northeastern RAC Standards and Guidelines). Grazing uses would continue under current conditions, and there would be no change in AUMs.

4.5 Water Resources

This section discusses impacts to water resources from the construction and operation of the SVWEF Proposed Action and alternatives. The analysis area includes both surface and groundwater resources within and surrounding the project area that could be altered by the Proposed Action and alternatives. Impacts to water resources would be determined by changes in water use, water quality, surface water flow patterns, and/or the nature of groundwater/surface water interaction within the project area.

4.5.1 Programmatic Environmental Impact Statement Impacts Summary

The types of change to water resources that may result from the construction and operation of a typical wind energy facility are described in Section 5.3 of the PEIS. Typically wind energy facilities do not require the use of much water, except during the construction phase. Construction uses of water occur in the short term. Operational water uses are generally minimal. Because this EA tiers to the PEIS analysis, a brief summary of those impacts to water resources that are relevant to the SVWEF are presented below. A summary of the related mitigation measures for water resources that have been fully analyzed in the PEIS is provided in Section 6.2 of this EA. The impacts and mitigation measures analyzed and described for the PEIS are herein incorporated into this document.

4.5.1.1 SURFACE WATER

4.5.1.1.1 Construction

The majority of impacts to surface water resources from a typical wind energy facility would occur during the construction phase. Construction activities associated with a typical wind energy facility would result in increased soil erosion, which could alter surface runoff patterns. Construction of wind facilities and access roads would result in increased ground disturbance, traffic levels, and accelerated weathering of soils, which may result in changes to water quality.

4.5.1.1.2 Operation and Maintenance

Impacts to water resources associated with operation and maintenance of a typical wind energy facility are identified in Section 5.3.3 of the PEIS and include degradation of water quality as a result of improper pesticide use or increased vehicle traffic.

4.5.1.2 GROUNDWATER

4.5.1.2.1 Construction

Short-term increases in water use would result from water application for dust control during construction of access roads, clearing of vegetation, grading, and road traffic; water for concrete used in the foundations of turbine towers and associated buildings; and water used by construction personnel. These construction water needs typical of a wind energy facility may result in having to deliver water from an off-site location, or extract water from nearby groundwater wells or surface water features.

In areas where a confined aquifer is present as a result of a hydrologic barrier, unwanted dewatering or recharge may occur as a result of excavation activities or withdrawal of groundwater. This may also impact water quality of downgradient resources.

4.5.1.2.2 Operation and Maintenance

Once the construction phase is completed, the environment is assumed to establish a new equilibrium. The potential impacts to groundwater during operations of a typical wind energy facility would be the same as those to surface water (Section 5.3.3 of the PEIS).

4.5.2 Proposed Action

4.5.2.1 SURFACE WATER

4.5.2.1.1 Construction

Under the Proposed Action, changes to water quality would result from the increased erosion associated with ground-disturbing activities, increased traffic from construction activities, and operation of heavy machinery. WTGs and related infrastructure occur within approximately 300 feet of spring and wetland areas. Construction near these areas could lead to increased surface runoff entering those areas. Because the slope throughout the project area is less than 10%, the risk of increased erosion is minimal. In addition, all temporary disturbances from construction activities would be restored to natural contours and reseeded with a BLM-approved seed mix. Increased erosion resulting from construction activities would occur during the 9- to 12-month construction period and would slowly diminish over the time required for restoration to be completed (up to 10 years).

Changes to surface water flows would result from construction of access roads and excavation activities. Construction activities would not cross Spring Creek or Cooper Canyon Wash. Additionally, access roads are located to minimize crossings of any remaining ephemeral washes, and avoid drainage bottoms and wetlands. All structures shall be located and constructed so that they do not decrease channel stability or increase water velocity. Additionally, implementation of the project SWPPP and SPP (see Appendix D), as well as BMPs for the Proposed Action (see Section 2.1.4) regarding runoff and sediment control, would further reduce impacts to surface water.

4.5.2.1.2 Operation and Maintenance

Under the Proposed Action, changes in water quality and erosion would result from surface water runoff during dust control for road maintenance. Water would be used as necessary during operations for road maintenance. Additionally, there would be an increase in impermeable surfaces within the project area from turbine pads, roads, substation, and the O&M facility that would result in increased surface runoff. Impermeable surfaces under the Proposed Action would be less than 10% of the project area (i.e., project footprint) and would be widely dispersed throughout the project area. As a result, there would be no measurable change in erosion potential and water quality in the project area. The application of mitigation measures and the project SWPPP and SPP (see Appendix D) would further reduce these impacts.

4.5.2.2 GROUNDWATER

4.5.2.2.1 Construction

Water use would be at its maximum during the construction phase of the project. The quantity of water assumed necessary during the construction phase would vary from approximately 5 million gallons (15.3acre-feet) under normal conditions to approximately 10 million gallons (30.7 acre-feet) under conditions of excessive drought. All necessary water for the Proposed Action would be obtained through a temporary lease with an existing water rights holder at the Cleveland Ranch in Spring Valley north of the project area. The water would be taken from an irrigation water storage impoundment, with an existing well as a supplemental source. The water use during the 9- to 12-month construction phase would

displace agricultural use and there would be no increase in water diversion from the basin. During initial geotechnical investigations conducted on the site, groundwater was encountered at a minimum of 14.5 feet but more often at a range of 18 to 40 feet (Kleinfelder 2010). Because turbine foundations would only be at a depth of approximately 8 feet, it is unlikely that the hydrology of the site would be adversely affected. Additionally, site-specific geotechnical analysis would occur at each proposed turbine location prior to any construction activities, and specific measures would be developed as needed to address geotechnical issues. If the perching groundwater layer, as identified by the on-site geologist or geotechnical engineer or engineer's representative is breached, the hole or breach point would be seal grouted to preserve the subsurface hydrology that feeds the local system.

4.5.2.2.2 Operation and Maintenance

No impacts to groundwater resources are anticipated to result from operation of the proposed wind facility. Water use during the operations phase would be limited to a minimal amount of water for dust control as a component of access road maintenance and potable water at the O&M facility.

4.5.3 Alternate Development Alternative

4.5.3.1 SURFACE WATER

4.5.3.1.1 Construction

Under the Alternate Development Alternative, changes to water quality and surface water flows from construction activities would occur, but would be less than those described under the Proposed Action. All springs, wetlands, or other perennial water features would be avoided during construction activities. Additionally, turbines and roads would be placed at least 0.5 mile away from open water sources, including springs and wetlands. The application of the project SWPPP and SPP (see Appendix D) would further reduce impacts to surface water.

4.5.3.1.2 Operation and Maintenance

Impacts to surface water under the Alternate Development Alternative would be similar to those described under the Proposed Action. Surface runoff from water use during road maintenance would occur as described under the Proposed Action. The amount of impermeable surfaces that would occur under the Alternate Development Alternative would be similar to the Proposed Action and would not exceed 10% of the project area. As a result, there would be no measurable change in erosion potential and water quality in the project area. The application of mitigation measures and the project SWPPP and SPP (see Appendix D) would further reduce these impacts.

4.5.3.2 GROUNDWATER

4.5.3.2.1 Construction

Under the Alternate Development Alternative, water use, amounts, and source would be the same as those described under the Proposed Action. Impacts to groundwater under the Alternate Development Alternative would be the same as those described under the Proposed Action.

4.5.3.2.2 Operation and Maintenance

Under the Alternate Development Alternative, no impacts to groundwater resources are anticipated to result from operation of the proposed wind facility. Water use during the operations phase would be the same as described under the Proposed Action.

4.5.4 No-Action Alternative

Under the No-Action Alternative, the BLM would not issue a ROW grant for the construction and operation of WTG facilities in the project area. Impacts to surface water and groundwater resources in the project area would be subject to existing conditions and trends.

4.6 Cultural Resources

Impacts to cultural resources eligible for the NRHP must be considered under Section 106 of the NHPA. The BLM is required to identify any cultural resources in the project area, evaluate their eligibility status for the NRHP, and consult with the SHPO. If the resources are NRHP eligible, the BLM must then assess whether or not the undertaking would have an adverse effect on those resources, and if necessary, mitigate any adverse effects on those resources.

The following analysis assumes that all ground-disturbing activities would be confined to the areas of disturbance identified in Chapter 2 under the Proposed Action and Alternate Development Alternative. For the purposes of this analysis, there is no difference between short-term and long-term disturbance. All cultural resource eligible for NRHP located within the project area would be avoided.

4.6.1 Programmatic Environmental Impact Statement Impacts Summary

The types of impacts to cultural resources that may result from the construction and operation of a typical wind energy facility are described in Section 5.12 of the PEIS. Because this EA tiers to the PEIS, a brief summary of those impacts to cultural resources that are relevant to the Proposed Action is presented below. A summary of the related mitigation measures for cultural resources that have been fully analyzed in the PEIS is provided in Section 6.2 of this EA. The impacts and mitigation measures analyzed and described for the PEIS are herein incorporated into this document.

4.6.1.1 CONSTRUCTION

Potential impacts to cultural resources from a typical wind energy facility are described in Section 5.12.2 of the PEIS. The impacts to cultural resources associated with construction of wind energy facilities would occur from both direct and indirect disturbances. The PEIS states that the amount of area disturbed could be considerable. Direct impacts to cultural resources include ground-disturbing activities related to construction. Indirect impacts may include soil erosion, both inside and adjacent to the impact footprint. Erosion causes impacts to archaeological sites by washing away either parts or all of a site, which creates a loss of scientific information that the site contains. Other indirect impacts include increased access to the area, which could result in looting, vandalism, and inadvertent destruction of cultural resources.

4.6.1.2 OPERATION AND MAINTENANCE

Potential impacts to cultural resources from operation of a typical wind energy facility are described in Section 5.12.3 of the PEIS. The impacts to cultural resources associated with operation and maintenance of wind energy facilities would be fewer than during construction. Ground-disturbing activities would be minimal and therefore cause less of an impact. Increased access provided by roads for maintenance would cause long-term impacts. Potential increased impacts include the likelihood of unauthorized collection of artifacts and vandalism and possible inadvertent destruction of unrecognized resources as a result of OHV activity.

4.6.2 Proposed Action

4.6.2.1 CONSTRUCTION

A Class III intensive cultural resource inventory was conducted on all possible ground-disturbing portions of this project. All known cultural resource sites eligible for the NRHP would be avoided. Cultural resource monitors would be present during all new ground-disturbing activities conducted during construction, operation and maintenance during the life of the project.

There is the potential for cultural resources not identified during the Class III inventory to occur below the surface within the project area. Therefore, damage and loss of cultural resources not identified during the Class III inventory may occur as a result of ground-disturbing activities such as clearing, grading, and excavation, as well as heavy equipment and vehicle movement within the project area. However, cultural resource monitors would be present during all new ground-disturbing activities based on the Monitoring and Discovery Plan (see Appendix E) and would reduce the risk of impact to currently unidentified sites. If any discoveries are made as a result of the ground-disturbing activities, work would stop immediately and the BLM cultural resource specialist assigned to the project would be notified. The BLM would then take the appropriate action regarding the discovery.

The increased presence of workers in the project area could result in an increased risk of looting, vandalism, and inadvertent destruction throughout the 9- to 12-month construction period. The monitor required by the Monitoring and Discovery Plan (see Appendix E) would deter any unauthorized personnel from collecting artifacts during the construction phase further reducing the risk of damage to cultural resources (Seymour and Villagran 2010). Additionally, on-site staff would be given a worker education training course that would provide them information on cultural resources, laws and regulations, and results of breaking those laws, which would further reduce potential for unauthorized collection, vandalism, and destruction (Seymour and Villagran 2010).

4.6.2.2 OPERATION AND MAINTENANCE

A Class III intensive cultural resource inventory was conducted on all possible ground-disturbing portions of this project. All known cultural resource sites eligible for the NRHP would be avoided. Cultural resource monitors would be present during all new ground-disturbing activities conducted during construction, operation, and maintenance during the life of the project.

If any discoveries are made as a result of the ground-disturbing activities, work would stop immediately and the BLM cultural resource specialist assigned to the project would be notified. The BLM would then take the appropriate action regarding the discovery.

There would be an indirect visual impact to up to five eligible historic structures. Prior to construction, any eligible site that would be visually impacted would be recorded based on SHPO documentation standards (SHPO 2010). Those standards include specific photo documentation and detailed recordation. Documentation to SHPO standards would mitigate impacts by recording the information about their historical character before it is impacted. Therefore, while there would be a visual impact to historic structures, mitigation would reduce that impact by keeping a record of the setting prior to project construction so that information is not lost.

Unauthorized collection of artifacts, vandalism, and destruction of sites could occur from increased human presence by site workers. However, the project uses existing roads as possible, and new roads were designed to avoid known cultural resources; therefore, an increased risk of damage to cultural resources from increased human presence is unlikely.

4.6.3 Alternate Development Alternative

4.6.3.1 CONSTRUCTION

Construction-related impacts from the Alternate Development Alternative would be similar to those described under the Proposed Action. However, impacts would be somewhat fewer because of the smaller project area (7,673 acres); therefore, there would be less potential to disrupt sites.

4.6.3.2 OPERATION AND MAINTENANCE

O&M-related impacts from the Alternate Development Alternative would be similar to those described under the Proposed Action. However, impacts would be somewhat fewer because of the smaller project boundary (7,673 acres); therefore, there would be less potential to disrupt sites.

4.6.4 No-Action Alternative

Under the No-Action Alternative, the SVWEF ROW application would be denied. Selection of the No-Action Alternative would not result in new impacts to cultural resources. The cultural resources would remain in place as they currently are. There would be no direct impacts from construction and maintenance or indirect impacts because of increased visitation of construction and maintenance workers.

4.7 Native American Religious Concerns

A project may adversely affect a historic property if it alters the characteristics that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property. “Integrity” is the ability of a property to convey its significance, based on its location, design, setting, materials, workmanship, feeling, and association. Adverse effects can be direct or indirect. They include reasonably foreseeable impacts that may occur later in time, be farther removed in distance, or be cumulative. Examples of adverse effects include

- physical destruction or damage;
- alteration inconsistent with the Secretary of the Interior’s Standards for the Treatment of Historic Properties;
- relocation of the property;
- change in the character of the property’s use or setting;
- introduction of incompatible visual, atmospheric, or audible elements;
- neglect and deterioration; and
- transfer, lease, or sale out of federal control without adequate preservation restrictions.

4.7.1 Programmatic Environmental Impact Statement Impacts Summary

The types of impacts to Native American Religious Concerns that may result from the construction and operation of a typical wind energy facility are described in Section 5.12 of the PEIS. Because this EA tiers to the PEIS, a brief summary of those impacts to Native American Religious Concerns that are relevant to the Proposed Action is presented below. A summary of the related mitigation measures for Native American Religious Concerns that have been fully analyzed in the PEIS is provided in Section 6.2 of this EA. The impacts and mitigation measures analyzed and described for the PEIS are herein incorporated into this document.

4.7.1.1 CONSTRUCTION

Potential impacts to Native American Concerns from a typical wind energy facility are described in Section 5.12.2 of the PEIS. The impacts to interests of Native Americans associated with construction of wind energy facilities would occur from both direct and indirect disturbances. The PEIS states that the amount of area disturbed could be considerable. Direct effects on areas of interest to Native Americans might include damage an area that is considered sacred or may have been, or continue to be, used for harvesting traditional resources, such as medicinal plants. Indirect effects may include soil erosion, both inside and adjacent to the impact footprint. Increased access to the area could also provide adverse impacts caused by looting, vandalism, and inadvertent destruction. Visual impacts to areas of interest to Native Americans can be direct or indirect. Construction equipment may degrade the visual significance or the area.

4.7.1.2 OPERATION AND MAINTENANCE

Potential impacts to Native American concerns from a typical wind energy facility are described in Section 5.12.3 of the PEIS. Direct effects on areas of interest to Native Americans might include damage an area that is considered sacred or may have been, or continue to be, used for harvesting traditional resources, such as medicinal plants. Visual impacts to areas of interest to Native Americans can be direct or indirect. Maintenance equipment and wind energy infrastructure may degrade the visual significance or the area.

4.7.2 Proposed Action

4.7.2.1 CONSTRUCTION

The impacts to interests of Native Americans associated with construction of the SVWEF would occur from both the removal of vegetation and the presence and operation of construction equipment. Direct disturbances may include the loss of traditional plant collecting areas and loss of previously undiscovered cultural resources. Visual contrasts from the presence of construction equipment would have a direct impact to the historic setting of the Swamp Cedar ACEC, an area of concern to the Native Americans. Additionally, noise from construction activities may also intermittently degrade the historic setting of the ACEC. Construction activities associated with the SVWEF would introduce visual and aural contrasts to existing conditions along the western edge of the ACEC, which would diminish the historic setting of the ACEC and the associated plant collecting, fandango, and massacre sites.

4.7.2.2 OPERATION AND MAINTENANCE

Operation and maintenance of the SVWEF would result in increased visitation to areas of interest to Native Americans. If public use of the project area increases, which is not anticipated, this would likely increase the unauthorized collection of artifacts, vandalism, and destruction of sites from OHV use and other inadvertent means. Visual contrasts from the presence of WTGs, and maintenance equipment to areas of interest to Native Americans would have a direct impact to the physical setting of the Swamp Cedar ACEC, an area of concern to Native Americans. Additionally, noise from the WTGs may also intermittently result in contrasts to the natural soundscape of the ACEC. The visual and aural contrasts that would result from the operation and maintenance of the SVWEF along the western edge of the ACEC would diminish the historic setting of the fandango and massacre sites.

4.7.3 Alternate Development Alternative

4.7.3.1 CONSTRUCTION

Adverse impacts to Native American interest resulting from construction of the Alternate Development Alternative would be similar to those described in the Proposed Action.

Visual contrasts from the presence and operation of construction equipment to areas of interest to Native Americans would have a direct impact to the Swamp Cedar ACEC, an area of concern to the Native Americans. The impact of construction equipment would be for the duration of the construction phase of the project and would vary, depending on the amount of equipment and numbers of construction personnel on the project at any given time. Through tribal consultation, WTGs and the associated construction areas were located to reduce those contrasts and reduce impacts to Native American religious concerns.

4.7.3.2 OPERATION AND MAINTENANCE

Adverse impacts to Native American interest resulting from development of the Alternate Development Alternative would generally be the same as those described under the Proposed Action. Visual contrasts of WTGs and associated facilities to areas of interest to Native Americans would have a direct impact to the Swamp Cedar ACEC, an area of concern to the Native Americans. The visual contrast from the presence of WTGs and associated infrastructure would affect the historic setting of the Swamp Cedar ACEC for the life of the project. However, through tribal consultation, WTGs were located to reduce those contrasts and reduce impacts to Native American religious concerns.

4.7.4 No-Action Alternative

Under the No-Action Alternative, the SVWEF ROW application would be denied. The current setting of the area of analysis is characterized by wide-open valley floors covered in grasses and shrubs, interspersed with juniper trees surrounded by high, rugged, parallel mountain ranges. Existing human modifications in the project area to the historic setting are limited to dirt surface tracks and roads, transmission lines, fences, and other ranch structures. Under the No-Action Alternative, the historic setting of the Swamp Cedar ACEC would continue to be influenced by these factors. Selection of the No-Action Alternative would not result in any new impacts to Native American interests.

4.8 Visual Resources

The impacts analysis for visual resources is an assessment of landscape changes that would result from the construction and operation of the wind energy facility under the Proposed Action. As discussed above, visual resources (the landscape) consist of landform (topography and soils), vegetation, and human-made structures (roads, buildings, utilities, and modifications of the land, vegetation, and water). Because changes to the characteristic landscape would be the primary direct impact of the wind facility to visual resources, the relative impacts to the characteristic landscape were assessed by comparing visual contrasts that would result from the construction and operation of the wind facility. The analysis also consists of an assessment of visual contrasts resulting from those same actions as seen from five KOPs. Because the wind energy facility is proposed on BLM-managed land, the analysis also consists of an assessment of whether the proposed changes to the landscape would meet the BLM's objectives for VRM, as prescribed in the Ely RMP (BLM 2008a).

The analysis of impacts to visual resources also considers an assessment of the changes to night sky conditions that might be caused by the Proposed Action. The impacts to night skies were assessed by comparing the increases in artificial nighttime lighting from the wind facility with current conditions.

4.8.1 Programmatic Environmental Impact Statement Impacts Summary

4.8.1.1 LANDSCAPE CHARACTER

The types of change to a landscape that may result from the construction and operation of a typical wind energy facility are described in Section 5.5 of the PEIS. Because this EA tiers to the PEIS analysis, a brief summary of those changes is presented below. A summary of the related mitigation measures for landscape character related to visual resources that have been fully analyzed in the PEIS is provided in Section 6.2 of this EA. The impacts and mitigation measures analyzed and described for the PEIS are herein incorporated into this document.

4.8.1.1.1 Construction

Impacts to visual resources associated with construction activities would result from new road development and other ground-disturbing actions. New roads would introduce linear contrasts in the landscape. Other ground-disturbing actions during construction would introduce visual contrasts into the color, form, texture, and line of the existing characteristic landscape. In addition, construction equipment, vehicles, and associated project activities, including restoration, would be temporarily visible during construction activities.

4.8.1.1.2 Operation and Maintenance

Impacts to visual resources associated with operation of a wind energy facility would result from the introduction of large WTGs into largely undeveloped and natural settings. Additionally, all aboveground structures associated with wind energy facilities (including fences around substations) would produce visual contrasts as a result of their typical physical characteristics (form, color, line, and texture) and reflective surfaces.

4.8.1.2 NIGHTTIME LIGHTING AND EXTENT OF SKY GLOW

The types of change to night skies that may result from the construction and operation of a typical wind energy facility are described in Section 5.11.2 of the PEIS. Because this EA tiers to the PEIS analysis, a brief summary of those changes is presented below. A summary of the related mitigation measures for nighttime lighting and sky glow that have been fully analyzed in the PEIS is provided in Section 6.2 of this EA. The impacts and mitigation measures analyzed and described for the PEIS are herein incorporated into this document.

4.8.1.2.1 Construction

The effects on night skies would be the same as those described under the Operation and Maintenance section below.

4.8.1.2.2 Operation and Maintenance

The addition of security and safety lighting associated with a typical wind energy facility, even if those lights are directed downward, would result in increased nighttime visibility. This is especially the case under the night sky conditions that are typical of the undeveloped areas common for potential wind

energy development. The addition of security and safety lighting would also contribute to sky glow. These effects can typically be mitigated by limiting the amount of artificial lighting associated with the facility and by including motion sensor controls.

In addition to security lighting, FAA rules require lights mounted on nacelles that flash red at night (2,000 candela). Typically, the FAA requires warning lights on the first and last WTGs in a string and every 1,000 to 1,400 feet in between. Because the warning beacons at night are red, and operated intermittently, they are not expected to result in increases to sky glow or glare.

4.8.2 Proposed Action

4.8.2.1 LANDSCAPE CHARACTER

4.8.2.1.1 Construction

New roads associated with the Proposed Action would introduce contrasts into the line, color, and texture of the existing landscape. In addition, construction equipment, vehicles, and associated project activities, including restoration, would be temporarily visible during the 9 to 12 months of construction activities. Areas of temporary disturbance would be reclaimed after construction activities are completed. Although construction activities are expected to last 9 to 12 months, it could take up to 10 years before the temporary disturbance areas are no longer visible. Even when vegetation is established following reclamation efforts, the composition of species in the recovery area is often different from the original plant community. Typically, grasses would establish early on, while shrubs would take much longer to re-establish. Visible signs of the temporary disturbance areas would persist for approximately 10 years beyond the construction and reclamation phase.

4.8.2.2 OPERATION AND MAINTENANCE

Under the Proposed Action, the wind energy facility has three types of facilities that would result in changes to the characteristic landscape: WTGs, substation and distribution, and access roads. The visual evidence of the proposed WTGs in Spring Valley cannot be reduced or concealed as a result of their size and exposed location. The substation and new power line would be located in close proximity to the existing power transmission lines crossing the project area. Although some existing dirt roads through the project area would be used, they would be expanded and improved and 27.8 miles of new dirt surface roads would be introduced, providing access throughout the project area.

During the long-term operation of the wind energy facility, the regular geometric forms and horizontal and vertical lines associated with the WTGs, substation, and access roads would result in a visual contrast with the irregular, organic forms, and colors of the existing landform and vegetation. In addition, color contrast associated with the WTGs would vary throughout the day and throughout the seasons as natural lighting conditions and colors change. Although the WTGs are not a reflective material, when seen from superior viewing positions at certain times of the day, they would result in intermittent bright colors that would sharply contrast with the dull hues of the surrounding tan soils and gray-green vegetation. The proposed access roads and utility infrastructure would parallel and repeat the basic visual elements of existing roads and transmission lines in the project area that are similar in form, line, and color.

A visual resource assessment was completed for the SVWEF, including visual simulations (example provided in Figure 4.8-1) and visual contrast ratings from each of the five KOPs (SWCA 2009e). Although there are visible contrasts apparent from each of the KOPs, four of the KOPs occur along travel routes and contrasts would be visible for only limited periods of time. The contrasts that would result from the Proposed Action are described for each of the KOPs below.

Figure 4.8-1. Visual simulation example for the Proposed Action from Wheeler Peak.

KOP 1. Elements of the Proposed Action would be visible from this KOP. The nearest proposed WTG is located 4.6 miles from the KOP. At this distance, the WTGs would be clearly visible, and there would be a moderate contrast with the line and color of the surrounding landscape. The WTGs would be visible against the backdrop of the valley floor and the rugged Schell Creek Range in the background and would contrast with the wide-open, expansive valley floor. From this section of U.S. Route 6/50, the project would be in view for approximately 7 miles against the backdrop of the Schell Creek Range. Viewers traveling at the 70 mph posted speed limit would view the project for no more than 10 minutes.

KOP 2. From this section of U.S. Route 6/50, the WTGs would be clearly visible for several miles against the backdrop of the Schell Creek Range. The tall vertical lines of the WTGs would contrast with the flowing, organic horizontal lines and the flat, expansive form of the valley floor. The nearest proposed WTG is located approximately 1.3 miles from the KOP. Viewers traveling at the 70 mph posted speed limit would view the project for no more than 10 minutes.

KOP 3. From this section of SR 893, the project would be in view for approximately 5 miles against the backdrop of the Snake Range. The tall, vertical lines of the WTGs are clearly visible and would result in contrasts to the organic horizontal lines of the valley floor and rugged mountains. Additionally, contrasts in form and color would occur. The nearest proposed WTG is located approximately 1 mile from the KOP. Viewers traveling at 65 mph would view the project for no more than 8 minutes.

KOP 4. The majority of WTGs would be set against the darker background of the mountains. The nearest proposed WTG would be located approximately 3.2 miles from the KOP; at this distance, the WTGs would be clearly visible, and contrasts to the organic form, line and color would occur. From this section of SR 893, the project would be in view for approximately 5 miles against the backdrop of the Schell Creek Range. Viewers traveling at 65 mph would view the project for no more than 8 minutes.

KOP 5 (Wheeler Peak). Although the WTGs and other aboveground facilities would be visible, as a result of the distance (11 miles) and the superior angle of observation, the apparent visual contrast would be low. At this distance, the WTGs appear as points on the valley floor connected by the faint geometric lines of the access roads. The scenic panoramic views of the surrounding rugged mountain ranges would dominate the view of visitors at the summit.

VRM objectives for public lands in the project area are Class III and Class IV. Implementation of the Proposed Action would result in moderate contrasts to the existing landscape and would attract the attention of casual viewers traveling through Spring Valley in a manner consistent with Class III/IV VRM objectives.

4.8.2.3 NIGHTTIME LIGHTING AND EXTENT OF SKY GLOW

4.8.2.3.1 Construction

The presence of security lighting and the intermittent need for lighting during nighttime construction activities would create short-term increases in artificial lighting. Nighttime lighting during construction would be directly visible to travelers through Spring Valley. The effects on night skies and sky glow would be the same as those described under the Operation and Maintenance section below.

4.8.2.3.2 Operation and Maintenance

Lighting for the wind facility under the Proposed Action would be designed to provide the minimum illumination needed to achieve safety and security objectives as described in the Lighting Plan (see Appendix C). Lighting would be shielded and directed to focus illumination downward on the desired areas and to minimize additional nighttime illumination from the wind facility. Because of the small

amount of artificial lighting being introduced at the wind facility, sky glow resulting from the Proposed Action would not contribute to an increase in the existing sky glow and would not result in a change to the Bortle Dark-Sky rating of Class 3 (Dark Sky Partners 2010).

There would be direct visibility of the warning lights from lands outside the project area, including GBNP. Direct visibility from GBNP would be limited to the ridgeline, high points, and western slopes of the Snake Range. Because trails accessing Wheeler Peak are day use trails only, and a majority of potential use areas along the western slope are forested, there would be minimal impacts to park visitors from direct glare (Dark Sky Partners 2010). Because the warning beacons at night are red, and operate intermittently, they would not result in observable increases to sky glow or glare. Additionally, if the FAA approves the use of intelligent on-demand obstruction lighting described in the section 2.1.4, the direct visibility of obstruction lighting from within Spring Valley and the Great Basin National Park would be further minimized.

4.8.3 Alternate Development Alternative

4.8.3.1 LANDSCAPE CHARACTER

4.8.3.1.1 Construction

Changes to the existing characteristic landscape from construction activities associated with the Alternate Development Alternative would be the same as those described under the Proposed Action. As a result of the changed footprint in this alternative, construction activities associated would occur more than 1 mile farther from KOP 3 and the Bastian Creek Ranch than under the Proposed Action. The increased distance between the ranch and construction activities would result in smaller short-term visible changes to the landscape from construction activities than under the Proposed Action.

4.8.3.1.2 Operation and Maintenance

Changes to the existing landscape from operations associated with the Alternate Development Alternative would be similar to those described under the Proposed Action. Under the Alternate Development Alternative, the SVWEF turbine layout would be located 1 mile farther south from KOP 3 and the Bastian Creek Ranch. At this distance, the visible contrasts would be similar but reduced from those described under the Proposed Action. Visible contrasts apparent from the remaining KOPs would be the same as those described under the Proposed Action.

Implementation of the Alternate Development Alternative would result in moderate contrasts to the existing landscape and would attract the attention of casual viewers traveling through Spring Valley in a manner consistent with Class III VRM objectives. A visual resource assessment was completed for the SVWEF, including visual simulations for the Alternate Development Alternative (example provided in Figure 4.8-2).

4.8.3.2 NIGHTTIME LIGHTING AND EXTENT OF SKY GLOW

4.8.3.2.1 Construction

Because the types and numbers of equipment and storage area locations would be the same as under the Proposed Action, the impacts to nighttime lighting from construction activities associated with the Alternate Development Alternative would be the same as those described under the Proposed Action.

Figure 4.8-2. Visual simulation example for the Alternate Development Alternative from Wheeler Peak.

4.8.3.2.2 Operation and Maintenance

Because the number of WTGs, location of the O&M facility, substation, and associated directional lighting for security would be same as under the Proposed Action, changes to nighttime lighting from operations associated with the Alternate Development Alternative would be the same as those described under the Proposed Action.

4.8.4 No-Action Alternative

4.8.4.1 LANDSCAPE CHARACTER

The current landscape in the area of analysis is characterized by expansive valley floors covered in grasses and shrubs, interspersed with taller juniper trees surrounded by high, rugged, parallel mountain ranges. Existing human modifications in the project area are limited to dirt surface tracks and roads, transmission lines, widely spaced residences, and ranch structures. Under the No-Action Alternative, the SVWEF ROW application would be denied and the landscape would continue to be influenced by these factors and would meet the BLM's objectives for management of VRM Class III areas.

4.8.4.2 NIGHTTIME LIGHTING AND EXTENT OF SKY GLOW

The night skies are characterized as that of a typical, rural sky. Under the No-Action Alternative, the SVWEF ROW application would be denied and night skies would continue to be influenced by existing sources of artificial nighttime light from the widely spread ranches and residences in Spring Valley and the towns of Ely and Baker.

4.9 Noise

Because an increase in ambient noise levels in the area of analysis would be the primary direct impact of the SVWEF on the soundscape, the relative impacts of the Proposed Action and alternative action to the soundscape was assessed by comparing changes in ambient noise levels from the construction and operation of the SVWEF in and around the project area.

Noise emissions are regulated by the EPA and OSHA. It is assumed that the Proposed Action and alternative action would comply with all federal, state, and local noise regulations, requirements, and ordinances during both the construction and operation phases of the wind facility. It is assumed that a hearing protection plan for workers and visitors would be part of the health and safety plan and would comply with OSHA requirements.

Analysis of noise impacts to biological resources is typically restricted to addressing potential impacts to species that use vocalizations during the breeding season. Information concerning the effects of noise on biological resources may be found in Section 4.2.2, Wildlife, and Section 4.3.3, Special-status Species.

4.9.1 Programmatic Environmental Impact Statement Impacts Summary

The types of change to the soundscape that may result from the construction and operation of a typical wind energy facility are described in Section 5.11.2 of the PEIS. Because this EA tiers to the PEIS analysis, a brief summary of those impacts to the soundscape that are relevant to the Proposed Action are presented below. A summary of the related mitigation measures for noise that have been fully analyzed in

the PEIS is provided in Section 6.2 of this EA. The impacts and mitigation measures analyzed and described for the PEIS are herein incorporated into this document.

4.9.1.1 CONSTRUCTION

Construction of a wind energy facility is accomplished in several different stages. Each stage has a different combination of equipment, depending on the work to be accomplished. Most construction activities would occur during the day. Noise levels generated by construction equipment would vary, depending on type, model, size, and condition of the equipment. Construction activities do not typically occur at night, and nighttime noise levels would drop to the background levels of the project area. Because construction activities are short term, the associated effects of noise would be temporary and intermittent.

Noise levels for typical equipment used during the construction of a wind energy facility project site range between 80 to 90 dBA at a distance of 50 feet. For the purposes of analysis, the PEIS assumed that only two of the noisiest pieces of equipment would operate simultaneously during any phase of construction. Based on that assumption, the PEIS estimated that with the two noisiest pieces of equipment operating simultaneously at peak load, noise levels would exceed the EPA guideline for residential Ldn noise (55 dBA) for a distance of 1,640 feet (EPA 1974).

4.9.1.2 OPERATION AND MAINTENANCE

Major noise sources associated with the operation and maintenance of a typical wind energy facility would be mechanical and aerodynamic noise; transformer and switchgear noise from substations; corona noise from transmission lines; vehicular traffic noise, including commuter and visitor and material delivery; and noise from the O&M facility.

The typical sound level from a single 1- to 1.4-MW wind turbine is described in the PEIS as approximately 100 to 104 dBA. Sound levels would decrease to 58 to 62 dBA at a distance of 164 feet from the turbine, which is about the same level as conversational speech at a distance of 3 feet. Sound levels would further decrease to 36 to 40 dBA at a distance of 2,000 feet from the turbine, when the wind is blowing from the turbine toward the noise receptor. This is consistent with the background noise conditions of a typical rural environment.

There are two sources of noise associated with substations: transformer noise and switchgear noise. A transformer produces a constant, low-frequency humming noise. Noise at a distance of 492 feet from an 80- to 160-MW transformer would be about 43 and 46 dBA (BLM 2005). These noise levels at a distance of 1,640 feet would be 33 and 36 dBA, which are typical of background levels in a rural environment.

Because of the arid climate and the remote location of most potential wind development sites on BLM-administered land, the impact of corona noise is not expected to be significant. Although corona noise could be an issue where transmission lines cross more populated areas, it would not likely cause a problem unless the residence is located within 500 feet of the transmission line.

Noise from infrequent diesel generator operations at the O&M facility and from traffic, ranging from light- to medium-duty vehicles, is expected to be negligible. Overall, the noise levels of continuous site operation would be lower than the noise levels associated with short-term construction activities.

4.9.2 Proposed Action

4.9.2.1 CONSTRUCTION

Project construction would occur in a phased schedule over a 9- to 12-month period. The following actions would be implemented as part of the construction phase of the Proposed Action and would result in increased ambient noise levels in the area of analysis consistent with those changes described in the PEIS:

- Employee and construction vehicle traffic; and
- Construction equipment operation.

Construction vehicle traffic would consist of workers traveling to and from the project area and haul trucks carrying equipment, supplies, and materials in and out of the project area. At the peak of construction, 125 employee vehicles would access the project area on a daily basis. Primary access for construction would be via U.S. Route 6/50 and SR 893. Noise from worker vehicles would be similar to the sound of existing traffic on both U.S. Route 6/50 and SR 893. There would be 6,402 large truck trips required for the delivery of turbine components and related equipment to the project site over the course of 9 to 12 months. Assuming a vehicle speed of no more than 25 mph in and adjacent to the project area, the average noise level (Leq) generated by haul trucks during the construction period as a result of the Proposed Action would be approximately 62 dBA at a distance of 50 feet from the source.

The changes in noise levels that would result from construction equipment operation would be the same as those described for the PEIS. The nearest residence occurs on the Bastian Creek Ranch, which is located approximately 1 mile from the nearest turbine location where construction activities would occur. At that distance, the construction noise would be audible intermittently, but noise levels would not exceed the EPA guideline for residential Ldn noise (55 dBA).

4.9.2.2 OPERATION AND MAINTENANCE

Noise associated with the operation and maintenance of the wind energy facility would occur throughout the 20-year life of the project. The following actions and facilities would be implemented as part of the Proposed Action and would result in increased ambient noise levels in the area of analysis consistent with those changes described in the PEIS:

- WTGs;
- Substation and transmission line;
- Employee and maintenance vehicle traffic; and
- Generator at the O&M facility.

WTGs under the Proposed Action are 2.0 to 2.3 MW. Noise levels of 55 dBA are projected by the turbine manufacturer to occur at 400 feet from the WTGs (Figure 4.9-1). Noise levels along the perimeter of the project area would be between 40 and 45 dBA, which is less than the existing daytime ambient noise levels of 55 dBA (Figure 4.9-1). As a result of noise attenuation over increasing distances, the noise resulting from the operation of WTGs would not be audible at the Bastian Creek Ranch, private property to the southeast, Cleve Creek Campground, or any location within the GBNP.

Transformer and switchgear noise from the substation and switchyard, along with corona noise from the transmission line, would result in noise levels similar to those described in the PEIS. Because there are no residences within 500 feet of the proposed transmission line and there are several existing transmission lines adjacent to the proposed transmission line, corona noise from the proposed transmission line would not be audible outside the project area.

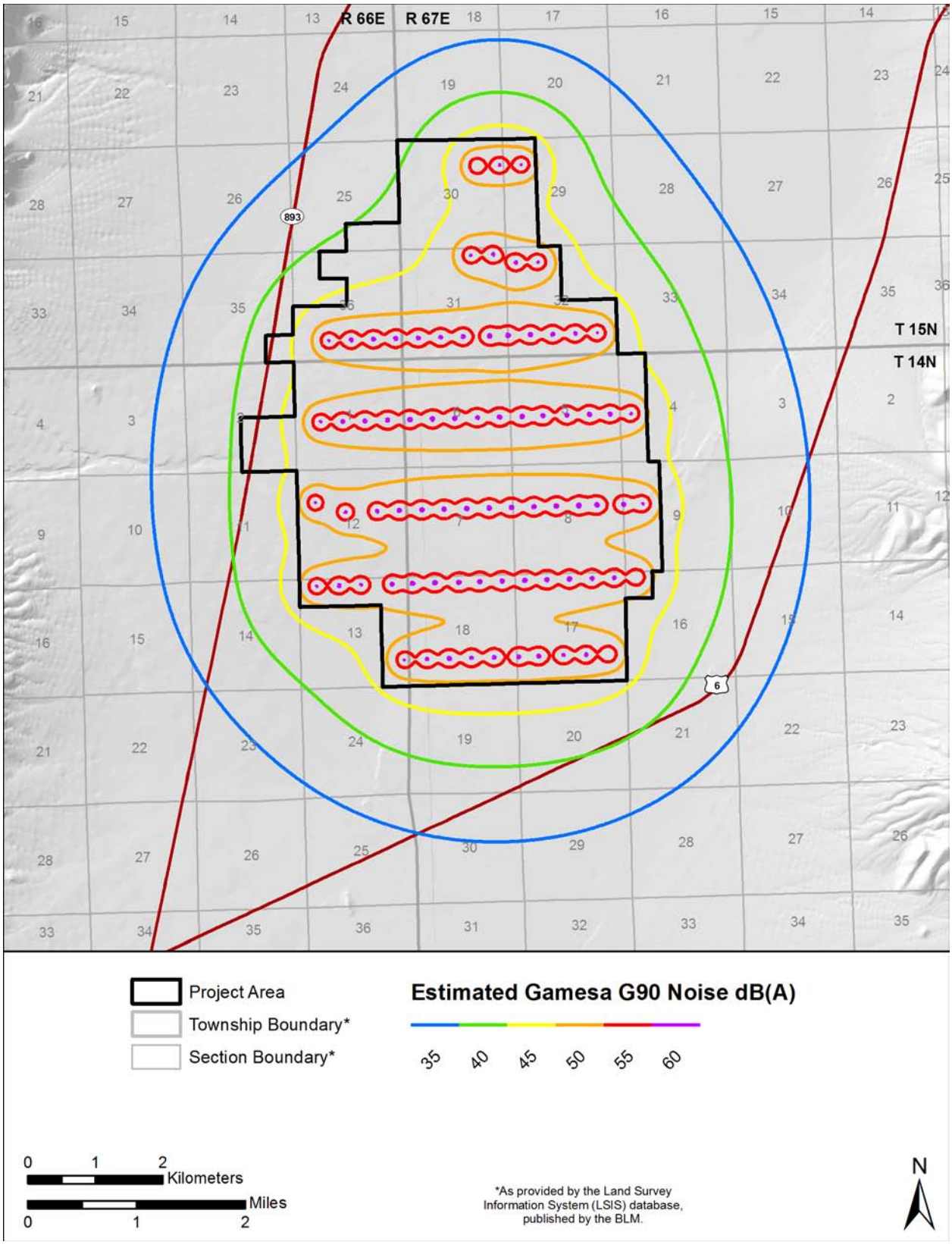

Figure 4.9-1. Noise levels for the Proposed Action.

Employee vehicle traffic would consist of workers traveling to and from the project area, intermittent delivery trucks carrying supplies, materials in and out of the project area, and maintenance vehicles within the project area. Up to 12 employee vehicles would access the project area on a daily basis. Primary access for construction would be via U.S. Route 50 and SR 893. Noise from worker vehicles would be consistent with the current sounds of existing traffic on both U.S. Route 50 and SR 893. The operational noise at the O&M facility would be consistent with those described in the PEIS and would not be audible outside the project area.

4.9.3 Alternate Development Alternative

4.9.3.1 CONSTRUCTION

Changes in ambient noise levels from construction activities associated with the Alternate Development Alternative would be similar to those described for the Proposed Action. Increased ambient noise levels from employee traffic and haul trucks would occur for the same duration as that described under the Proposed Action.

Under the Alternate Development Alternative, the turbines nearest the Bastian Creek Ranch from the Proposed Action would not be constructed (Figure 4.9-2). As a result of the changed footprint in this alternative, construction activities associated would occur more than 1 mile farther from the Bastian Creek Ranch than under the Proposed Action. The increased distance between the ranch and construction activities would result in a smaller short-term increase in audible construction noise than under the Proposed Action.

4.9.3.2 OPERATION AND MAINTENANCE

Changes in ambient noise levels from operations associated with the Alternate Development Alternative would be the same as those described for the Proposed Action. Under the Alternate Development Alternative, the SVWEF turbine layout would be located farther south from the Bastian Creek Ranch. Because noise levels along the perimeter of the project area would remain less than the existing ambient noise level (see Figure 4.9-2), the change to the turbine layout would not result in audible changes to noise levels at the Bastian Creek Ranch, Cleve Creek Campground, or any location within the GBNP.

4.9.4 No-Action Alternative

Existing noise sources in the area of analysis consist of sporadic vehicle traffic, small machinery, distant aircraft, and natural sounds from wind, rustling vegetation, birds, and insects. Under the No-Action Alternative, the SVWEF ROW application would be denied and current ambient noise levels in the area of analysis would continue to be influenced by these factors, and existing conditions of the soundscape would remain quiet.

4.10 Transportation

This section discusses impacts to transportation from the construction and operation of the Spring Valley wind energy facility. Impacts to transportation would be determined by changes to traffic volumes and public access that are brought on by the implementation of the Proposed Action or the Alternate Development Alternative.

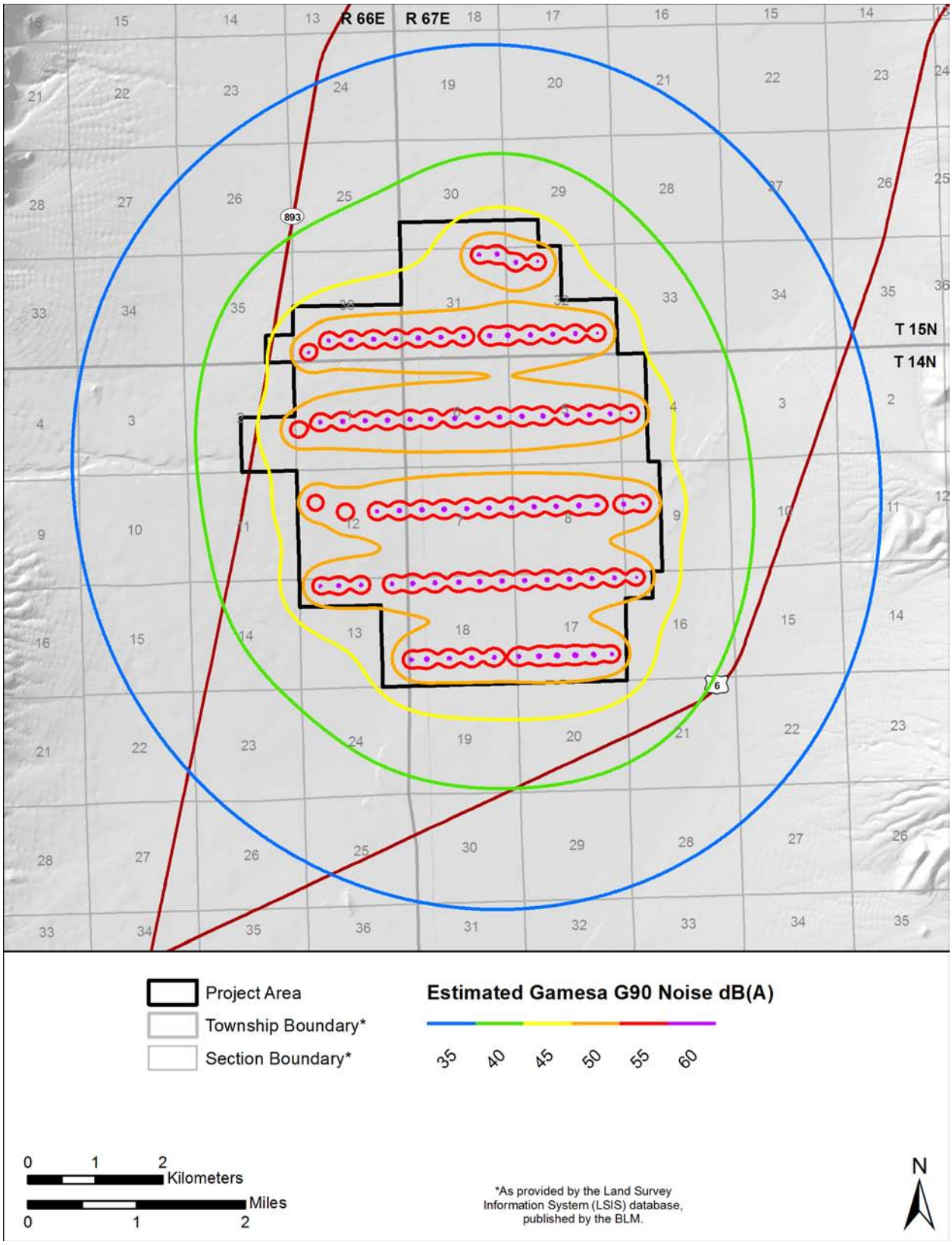

Figure 4.9-2. Noise levels for the Alternate Development Alternative.

4.10.1 Programmatic Environmental Impact Statement Impacts Summary

Potential impacts to transportation from a typical wind energy facility are described in Section 5.6 of the Land Use section of the PEIS and are consistent with this project. Because this EA tiers to the PEIS analysis, a brief summary of impacts to transportation is presented below. A summary of the related mitigation measures for transportation that have been fully analyzed in the PEIS is provided in Section 6.2 of this EA. The impacts and mitigation measures analyzed and described for the PEIS are herein incorporated into this document.

4.10.1.1 CONSTRUCTION

Transportation of equipment and materials to a typical wind energy facility during construction would result in short-term increases in the traffic levels during the construction period. Most construction equipment (e.g., heavy earthmoving equipment and cranes) would remain on-site during the entire construction period.

Delivery of overweight and/or oversized loads would result in temporary disruptions on the secondary and primary roads used to access a construction site.

4.10.1.2 OPERATION AND MAINTENANCE

Typical wind energy facilities may be attended by a small maintenance crew of six individuals or fewer. The transportation needs of a small maintenance staff would be restricted to a small number of daily trips by pickup trucks, medium-duty vehicles, or personal vehicles. During the life of a wind energy facility, it may become necessary to replace large pieces of equipment in the event of mechanical problems. The need for such deliveries would be expected to be infrequent.

4.10.2 Proposed Action

4.10.2.1 CONSTRUCTION

Under the Proposed Action, approximately 27.8 miles of new roads would be constructed within the project area to provide construction and delivery personnel with access to turbine sites and associated project facilities. Site construction activities would involve vehicular traffic, associated equipment delivery, turbine erection, turbine and ancillary facility construction, and access road construction. At the peak of construction, approximately 150 daily round trips by vehicles transporting construction personnel to the site each day would occur. Additionally, over the entire course of the construction period, approximately 6,402 trips of large trucks delivering the turbine components and related equipment to the project site would occur. Deliveries would not occur on a regular daily basis throughout the construction period.

Short-term adverse impacts associated with project construction would consist of an increase of almost three times the current daily traffic volume along SR 893. This increase would result in access delays to current travelers in the area. The additional large-truck traffic would contribute to greater traffic delays intermittently on U.S. Route 93, U.S. Route 6/50, and SR 893. This increased traffic would occur during the 9- to 12-month construction phase.

A site-specific Traffic Management Plan for the SVWEF has been prepared (see Appendix B) that provides methods for addressing traffic control issues resulting from construction activities, minimum road design standards, and any other stipulations required by the BLM or any other associated land

management/jurisdictional agencies. The plan also includes minimum requirements of a route study and transportation plan that would be completed by the turbine vendor, once turbines are purchased. Incorporation of these methods into the Proposed Action would reduce adverse impacts by managing traffic flow and reducing delays.

4.10.2.2 OPERATION AND MAINTENANCE

Operation and maintenance of the SVWEF would result in similar impacts to transportation as those described in the PEIS; however, up to 12 regular employees would be on-site each day. The access roads built and used during the construction phase would be maintained throughout commercial operations. Because of the small number of permanent staff, the Proposed Action would not result in long-term adverse impacts to transportation within or near the project area.

4.10.3 Alternate Development Alternative

4.10.3.1 CONSTRUCTION

Because the construction methods, employment numbers, and timing would be the same under the Alternate Development Alternative as the Proposed Action, the short-term, intermittent increases in traffic and delays in access would be the same.

4.10.3.2 OPERATION

Because the long term employment levels and number of new access roads would be the same as under the Proposed Action, the impacts to transportation under the Alternate Development Alternative would be the same as those under the Proposed Action.

4.10.4 No-Action Alternative

Under the No-Action Alternative, the SVWEF ROW application would be denied traffic and transportation in the project area and across Spring Valley would continue to be influenced by current conditions.

4.11 Land Use and Special Designations

This section discusses impacts to land use and special designations from the construction and operation of the SVWEF. Impacts to land use and special designations are assessed by determining conflicts with existing plans, designations, management prescriptions, or changes to the types of existing land uses in the analysis area brought on by the implementation of the Proposed Action or the Alternate Development Alternative. As stated in Chapter 2, the BLM has determined that the proposed SVWEF is in conformance with the Ely RMP and is consistent with the White Pine County Land Use Plan.

4.11.1 Programmatic Environmental Impact Statement Impacts Summary

4.11.1.1 LANDS AND REALTY

Potential impacts to lands and realty from a typical wind energy facility are described in Section 5.10 of the PEIS and are consistent with this project. Because this EA tiers to the PEIS, a brief summary of the impacts to lands and realty that are relevant to the Proposed Action is presented below. A summary of the

related mitigation measures for lands and realty that have been fully analyzed in the PEIS is provided in Section 6.2 of this EA. The impacts and mitigation measures analyzed and described for the PEIS are herein incorporated into this document.

4.11.1.1.1 Construction

Construction activities associated with a typical wind energy facility would result in the short-term, intermittent loss of BLM lands available for existing authorized uses (BLM 2005:Section 5.10.1).

4.11.1.1.2 Operation and Maintenance

The footprint of a typical wind energy facility is a fraction of the overall leased area. For that reason, wind energy facilities are considered to be compatible with a wide variety of land uses and do not preclude other existing or pending activities that occur within a project area (BLM 2005:Section 5.10.1).

4.11.1.2 SPECIAL DESIGNATIONS

When the PEIS was prepared, ACECs were excluded from consideration for wind energy development because they were identified as containing resources that could result in the denial of wind energy development applications (BLM 2005:Section 5.10.1). For that reason, impacts to ACECs are not described in the PEIS, and only the project-specific impacts to ACECs are presented in this EA.

4.11.2 Proposed Action

4.11.2.1 LANDS AND REALTY

4.11.2.1.1 Construction

The increased vehicle traffic from construction employees and component deliveries would result in intermittent delays to individuals accessing existing ROWs in and adjacent to the project area. These intermittent delays would occur over the 9- to 12-month construction period, after which time ROW access would return to current conditions. A traffic management plan detailing on-site traffic management requirements and route transportation planning guidelines for the project is available in Appendix B and would help reduce impacts to ROW access by managing traffic flow.

4.11.2.1.2 Operation and Maintenance

Under the Proposed Action, BLM would issue a 30-year non-exclusive ROW grant to allow the wind energy facility on federally managed lands. Because the wind energy facility ROW must conform to the terms and conditions of previously issued ROWs, there would be no impacts to utility corridors and other existing ROWs from implementing the Proposed Action.

As described in the PEIS, the majority of the SVWEF project area would remain available for other compatible land uses. Pending ROWs described in Section 3.11.1 of the EA, including the SNWA proposed water pipeline and groundwater development facilities, and SNWA ROW N-84216 (piezometers), would be compatible with the SVWEF so long as those uses avoid conflicts with the operation and maintenance of the SVWEF. The area of avoidance would correspond to the permanent SVWEF footprint, which is 1% of the project area.

4.11.2.2 SPECIAL DESIGNATIONS

Although the SVWEF does not overlap any ACEC boundaries and is in conformance with the special management prescriptions identified for both ACECs in the BLM Ely RMP, because the Proposed Action would indirectly impact resources associated with the ACECs, these resources are included for analysis.

4.11.2.2.1 Construction

Construction activities associated with the Proposed Action would not result in conflicts with the special management prescriptions for the Rose Guano Cave or Swamp Cedar ACECs. Installation of the infrared beam-break system or remotely accessible bat acoustic detector directly into the native rock of the Rose Guano Cave would result in an alteration of the rock face at the cave entrance. The equipment would allow data to be collected related to movements of the Brazilian free-tailed bat population in and out of the cave. The addition of the equipment would not adversely affect the status of the cave as an ACEC and may lead to improvements in the special management of the cave as an ACEC.

An increase in ambient noise and fugitive dust would result from construction activities and would diminish the natural and undeveloped setting of the Swamp Cedar ACEC over the 9- to 12-month construction period. These impacts would be reduced through implementation of BMPs described in Table 6.2-1.

Construction activities would not result in long-term changes to the resources for which the Rose Guano Cave and Swamp Cedar ACECs were designated. Although there would be short-term decreases in surface water sources and loss of vegetation, the Brazilian free-tailed bats associated with the Rose Guano Cave ACEC are able to forage in the extensive areas of Spring Valley outside the project area during the construction period. Additional impacts to this species are discussed in Section 4.3, Special-status Species.

During initial geotechnical investigations conducted on the site, groundwater was encountered at a minimum of 14.5 feet but more often at a range of 18 to 40 feet (Kleinfelder 2010). Because turbine foundations would only be at a depth of approximately 8 feet, it is unlikely that the hydrology of the site would be adversely affected. Additionally, site-specific geotechnical analysis would occur at each proposed turbine location prior to any construction activities, and specific measures would be developed as needed to address geotechnical issues. If the perching groundwater layer, as identified by the on-site geologist or geotechnical engineer or engineer's representative is breached, the hole or breach point would be seal grouted to preserve the subsurface hydrology that feeds the local system. Based on the hydrogeology study, recharge of the basin aquifer occurs on the basin margins and the project area is in an area of net discharge, primarily through evapo-transpiration. As a result, construction activities would not result in changes to the existing hydrology that supports the vegetation in the Swamp Cedar ACEC (Kleinfelder 2010).

4.11.2.2.2 Operation and Maintenance

Operation and maintenance activities associated with the Proposed Action would not result in conflicts with the special management prescriptions for the Rose Guano Cave and Swamp Cedar ACECs. Direct, short-term impacts to the Swamp Cedar ACEC would include groundwater impacts described in Section 5.3.2.4 and vegetation impacts described in Section 5.9.2.1 of the PEIS (BLM 2005). Potential groundwater impacts include alteration of surface and subsurface water flows and degradation of water quality. Potential vegetation impacts include fugitive dust, establishment of invasive plants, exposure to contaminants, and direct injury or mortality of vegetation.

Operations would result in impacts to the Brazilian free-tailed bats associated with the Rose Guano Cave ACEC and are described in Section 4.3.3.6, Special-status Bats. The presence of WTGs would result in long-term changes to the natural and undeveloped character of lands that contribute to the historic setting of the Swamp Cedar ACEC and are further described in Section 4.8, Visual Resources, and Section 4.6, Cultural Resources.

4.11.3 Alternate Development Alternative

4.11.3.1 LANDS AND REALTY

4.11.3.1.1 Construction

Because the construction methods and timing would be the same under the Alternate Development Alternative as under the Proposed Action, the short-term, intermittent conflicts with existing land uses would be similar. Under the Alternate Development Alternative, construction activities would be limited to the smaller project area (7,673 acres). The effects of construction activities on ROW access would occur over a smaller area than under the Proposed Action.

4.11.3.1.2 Operation and Maintenance

The types of impacts to lands and realty under the Alternate Development Alternative would be the same as those described under the Proposed Action. Because the WTG and facility layout would occur in a smaller area, and there would be fewer new access roads, the area of avoidance for new proposed land uses would be less than under the Proposed Action.

4.11.3.2 SPECIAL DESIGNATIONS

4.11.3.2.1 Construction

Because the construction methods, timing, and location relative to the ACECs would be the same as those described under the Proposed Action, construction-related impacts to ACECs resulting from implementation of the Alternate Development Alternative would be the same as under the Proposed Action. Additionally, because the project area is located in a groundwater discharge area, construction activities would not result in changes to the existing hydrology that supports the vegetation in the Swamp Cedar ACEC (Kleinfelder 2010).

Installation of the infrared beam-break system or remotely accessible bat acoustic detector directly into the native rock of the Rose Guano Cave would result in impacts to the ACEC that are the same as under the Proposed Action.

4.11.3.2.2 Operation and Maintenance

Because the alternative WTG layout avoids all water resources, impacts to the Brazilian free-tailed bats associated with the Rose Guano Cave ACEC would be fewer than under the Proposed Action. These impacts are described in detail in Section 4.3.3.6, Special-status Bats. The alternative WTG layout would result in changes to the natural and undeveloped character of lands that contribute to the historic setting of the Swamp Cedar ACEC that are similar to those under the Proposed Action.

4.11.4 No-Action Alternative

4.11.4.1 LANDS AND REALTY

Under the No-Action Alternative, the SVWEF ROW application would be denied and the BLM land on which the project is proposed would continue to be managed within BLM's framework of a program of multiple use and sustained yield and the maintenance of environmental quality (43 USC 1781 (b)) in conformance with applicable statues, regulations, and BLM's Ely RMP. Current land uses in the area of analysis include grazing, utilities, dispersed recreation, low-density residential, and transportation. Land in the immediate vicinity of the project area would remain primarily open rangelands, with utilities, roads, and widely dispersed, low-density residential uses on private parcels. Current land uses in the analysis area would continue under the No-Action Alternative, and the project area would become available to other uses consistent with BLM's Ely RMP/FEIS, potentially including other wind energy projects.

4.11.4.2 SPECIAL DESIGNATIONS

Under the No-Action Alternative, a ROW for the SVWEF would not be issued. Management of the Rose Guano Cave and Swamp Cedar ACECs would continue as directed by the BLM Ely RMP/FEIS (BLM 2008a). Resources associated with the ACECs would continue to be influenced by existing current conditions.

4.12 Recreation

This section discusses impacts to recreation from the construction and operation of the SVWEF Proposed Action and Alternate Development Alternative. Impacts to recreation would be determined by changes to recreation sites, opportunities, and activities. Additionally, impacts would be determined by changes to the settings needed to support those activities and desired recreational experiences that are brought on by the implementation of the Proposed Action.

The analysis area includes lands adjacent to the project area where the sights from the Proposed Action would be experienced by the visitor. To assess changes to recreation opportunities resulting from the wind energy facility, this analysis references information from the Visual Resources section of this chapter.

4.12.1 Programmatic Environmental Impact Statement Impacts Summary

Potential impacts to recreation areas from a typical wind energy facility are described in Section 5.10.4 of the Land Use section of the PEIS and are consistent with the Proposed Action. Because this EA tiers to the PEIS analysis, a brief summary of impacts to recreation is presented below. A summary of the related mitigation measures for recreation that have been fully analyzed in the PEIS is provided in Section 6.2 of this EA. The impacts and mitigation measures analyzed and described for the PEIS are herein incorporated into this document.

4.12.1.1 CONSTRUCTION

During construction, noise, dust, traffic, and the presence of a construction force would diminish the rural and primitive character of typical project areas in the short term. Changes to the rural and primitive character of an area would result in displacement of some visitors as they seek other undeveloped areas in which to engage in recreational activities (BLM 2005:Section 5.10.4).

4.12.1.2 OPERATION AND MAINTENANCE

Operation and maintenance of typical wind energy facilities would have both positive and negative effects on the opportunities for dispersed recreation activities. Access roads associated with typical wind energy facilities could result in enhanced public access to some previously difficult or inaccessible areas. Alternately, persons who may otherwise use an area for remote and dispersed recreational experience may be displaced to other locations (BLM 2005:Section 5.10.4).

4.12.2 Proposed Action

4.12.2.1 CONSTRUCTION

Under the Proposed Action, changes to recreation opportunities in and around the project area would result from restricted public access during construction activities and from changes to the characteristic rural and primitive setting of Spring Valley. Public access would be restricted where active construction is taking place and would result in the short-term displacement of dispersed recreational opportunities, such as hunting, within a portion of the Loneliest Highway SRMA. Warning signs would be posted along access roads indicating the dates of construction activities and recommending that the public take alternate routes during that time period. The intermittent loss of public access would occur over a period of 9 to 12 months.

The increased daily traffic from construction workers traveling to and from the project area and the traffic control necessary for large turbine component delivery vehicles would result in short-term, intermittent delays for visitors to Cleve Creek Campground, Sacramento Pass, GBNP, and other dispersed recreation opportunities within Spring Valley and the surrounding mountains. The project Traffic Management Plan (see Appendix B) would help reduce traffic delays.

Because the effects of construction would occur over a period of 9 to 12 months, the Proposed Action would not result in long-term changes to recreation sites, uses, experiences, or opportunities. Additionally, the short-term impacts of construction activities are not expected to result in the permanent displacement of recreation user groups to other recreation sites or areas. BMPs from the PEIS for minimizing resource impacts during the construction phase would be implemented during development of the Proposed Action and are listed in Table 6.2-1.

4.12.2.2 OPERATION AND MAINTENANCE

There would be no direct loss of developed recreation sites within the SRMA as a result of the Proposed Action. The introduction of large WTGs would result in decreased scenic quality, affecting the experience of visitors seeking primitive and dispersed recreation opportunities within this portion of the Loneliest Highway SRMA. The Proposed Action would be clearly visible to visitors traveling to GBNP from the west. Additionally, elements of the SVWEF would be visible from the west side of the Snake Range, Wheeler Peak, and portions of the Wheeler Peak Trail. Visual resource impacts are further discussed in Section 4.8.

Public access through the project area would be restored during operations. Only the substation and O&M facility would be securely fenced. The improvement of existing dirt surface roads and the addition of 27.5 miles of new roads constructed and maintained through the project area would result in improved public access across Spring Valley. Although road access in the project area would be improved, it would not result in an increase in public use of the area. The wide, flat, graded access roads necessary for the SVWEF are not anticipated to attract additional OHV recreational use to the project area.

Although hunting would not be excluded from the project area, the presence of WTGs, structures, and a permanent workforce would discourage hunters from using the project area. Because elk and mule deer do not typically congregate in the valleys during the hunt season and NDOW does not recommend the lower elevations common in Spring Valley for elk and mule deer hunts, operations would not result in a loss of hunting opportunities for elk and mule deer. Pronghorn are known to congregate in the valley floors typical of the project area during the hunt season, and NDOW does recommend valley floors in Game Management Unit 111 for pronghorn hunts. Because the project area represents only 1% of Game Management Unit 111 and large areas of the valley floor where pronghorn congregate would remain undeveloped, the result of operations on pronghorn hunting opportunities within the game management unit would be minor.

4.12.3 Alternate Development Alternative

4.12.3.1 CONSTRUCTION

Changes to recreation sites, settings, opportunities, and activities from construction activities associated with the Alternate Development Alternative would be similar to those described under the Proposed Action. Restrictions to public access, intermittent traffic delays, and changes to the rural and primitive character of the area would occur for the same duration as that described under the Proposed Action.

4.12.3.2 OPERATION

The types of impacts to recreation under the Alternate Development Alternative would be the same as those described under the Proposed Action. The overall amount of land where changes to recreation opportunities, settings, and activities would occur would remain the same as under the Proposed Action. Because the turbine and facility layout is different in places, the specific lands where displacement and changes to dispersed recreation opportunities would occur within the project area would be different.

4.12.4 No-Action Alternative

Under the No-Action Alternative, the SVWEF ROW application would be denied and recreation opportunities in the project area would continue to be managed consistent with the objectives of the Loneliest Highway SRMA and BLM's Ely RMP/FEIS. Current recreation opportunities, settings, and activities in the area of analysis would continue to be affected by existing conditions under the No-Action Alternative. The project area would remain available for recreation activities, including hunting, motorized touring, and other types of dispersed recreation.

4.13 Socioeconomics

This section discusses impacts to socioeconomics from the construction and operation of the SVWEF. Impacts to socioeconomics are considered in terms of the potential changes to employment, income, and tax revenues brought on by the implementation of the Proposed Action and the Alternate Development Alternative.

4.13.1 Programmatic Environmental Impact Statement Impacts Summary

Potential impacts to socioeconomics from a typical wind energy facility are described in Sections 5.13.1 and 5.13.2 of the PEIS and are consistent with the Proposed Action. Because this EA tiers to the PEIS analysis, a brief summary of impacts to socioeconomics is presented below. A summary of the related

mitigation measures for socioeconomics that have been fully analyzed in the PEIS is provided in Section 6.2 of this EA. The impacts and mitigation measures analyzed and described for the PEIS are herein incorporated into this document.

4.13.1.1 CONSTRUCTION

Direct impacts to socioeconomics associated with construction and operation of a typical wind energy facility include the creation of new jobs and the associated income and taxes paid. Indirect impacts would result from new economic development and include new jobs at businesses that support the wind energy facility workforce or provide services and materials for the wind energy facility itself, along with associated income and taxes.

4.13.1.2 OPERATION AND MAINTENANCE

Studies of the indirect impacts to property values of areas surrounding and nearby the typical wind farm operation are described in Section 5.13.2 of the PEIS. A loss of private residential property value is often raised as a concern related to the location of wind energy facilities. The PEIS did not directly assess the impacts of wind energy facilities on property values; however, the PEIS did summarize the results of two existing studies that found no evidence that the presence of WTGs resulted in decreased property values.

4.13.2 Proposed Action

4.13.2.1 CONSTRUCTION

Construction activities associated with the Proposed Action would result in the addition of 175 to 225 new construction-related jobs in the area. It is assumed that a portion of construction staff would be hired from outside White Pine County. Because of the short-term nature of the construction activities, it is further assumed that workers from out of the area would not relocate with their families. This short-term increase in population would result in an increased demand for hotel rooms, rental properties, and local services (restaurants, grocery stores, etc.). The short-term increase in population would also result in increased local spending, which would benefit White Pine County businesses and increase local room and sales tax revenue over the 9- to 12-month construction period. Because workers from outside White Pine County would represent only a portion of the overall construction workforce and are not expected to be accompanied by families, the increase in demand on community facilities and services (schools, hospitals, etc.) would be minor.

4.13.2.2 OPERATION AND MAINTENANCE

The impacts to socioeconomics associated with the operation and maintenance of a wind energy facility would occur from changes in the local economy. Activities that would result in changes to the local economy consist of increased local employment, increased purchase of materials and supplies from local vendors, increased expenditures by workers for lodging, restaurants, and recreation, and increased property tax revenue to White Pine County. All of these changes would have a beneficial impact to the local economy.

Employment associated with the operation of the proposed wind energy facility would total 12 new long-term jobs. Twelve new long-term jobs represent 1% of the employment opportunities currently provided by the mining industry in White Pine County. Because of the small number of new jobs relative to current employment opportunities in White Pine County, the change to employment, housing, population, community facilities, and services would be minor during operations.

Nevada assesses property taxes on WTGs based on the WTGs' being personal and not real property. Annual personal property tax revenues would accrue to White Pine County. A typical turbine costs $3,500,000 installed (Windustry 2009). Based on a maximum of 75 turbines installed, the project would have an approximate value of $260,000,000. The current tax rate is 3.66% of the assessed project value × 35%. In addition, there is a 50% tax abatement in place for wind projects. Accordingly, if the project was assessed at $260 million, the first year's personal property taxes would be $1,655,300 ($260,000,000 × 3.66% × 35% × 0.5 = $1,655,300) (personal communication, George Hardie, SVW, November 4, 2009). These tax revenues would decline each year as the value of the facility components depreciate.

There are several private land parcels adjacent to and near the project area. Because there are so few residential private land parcels in Spring Valley, a site-specific study of the effects of the wind energy facility on property values was not prepared. In addition to the general analysis presented in the PEIS, a study prepared for the DOE in 2009 provides further support that the presence of WTGs has no impact on property values (Hoen 2009). Based on data collected from the sale of 7,500 single-family homes located within 10 miles of 24 existing wind facilities in nine different states, the study found no evidence that home prices in lands surrounding wind facilities are impacted by either the view of wind facilities or the distance from the home to those facilities. Although there is the possibility that values of some individual homes have been or could be negatively impacted, those impacts have been either too small and/or too infrequent to be considered an observable impact (Hoen 2009:75).Tourism in White Pine County is largely based on available outdoor recreational opportunities (White Pine County Tourism and Recreation Board 2008). The project area is representative of the overall landscape seen in White Pine County but does not provide any facilities to encourage tourism in the immediate area. The closest area that draws tourists is the Cleve Creek Campground. The SVWEF is not visible from the campground and therefore is not anticipated to see a measurable reduction or increase in visitation.

There is evidence that wind projects do not have a negative impact on tourism but may lead to increased visitation (American Wind Energy Association 2010). However, because of the isolated nature of the SVWEF, an increase in tourism to that part of White Pine County is not anticipated. A small but immeasurable increase in visitation to the project area may occur from people already in the area visiting GBNP or other tourist sites, stopping to view the facility as they drive past.

4.13.3 Alternate Development Alternative

4.13.3.1 CONSTRUCTION

Because the construction staffing and timing would be the same under the Alternate Development Alternative as under the Proposed Action, impacts to socioeconomics would be the same.

4.13.3.2 OPERATION

The impacts to socioeconomics under the Alternate Development Alternative would be the same as those under the Proposed Action. The long-term employment opportunities would be the same as under the Proposed Action. Because the same number of turbines would be installed, the increase in property tax income to the county would be the same as under the Proposed Action and there would be no change in the value of private property parcels.

4.13.4 No-Action Alternative

Under the No-Action Alternative, the SVWEF ROW application would be denied and the wind generation facility would not be constructed, and socioeconomic conditions in White Pine County and the

vicinity of the project area would continue to be subject to existing conditions and local trends. There would be no new short-term or long-term jobs created and no increase in property taxes to the County.

4.14 Air Quality

This section discusses impacts to air quality from the construction and operation of the SVWEF. Both indirect and direct impacts are analyzed for air quality. The impacts analysis for air quality is an assessment of the increases in criteria pollutants and the effect to attainment status in the project that would result from the construction and operation of the wind energy facility under the Proposed Action and alternatives. Because changes in the emissions of criteria pollutants would be the primary direct impacts of the wind energy facility on air quality, the relative impacts to air quality were assessed by comparing the changes that would result from the construction and operation of the wind facility under the alternatives.

The impacts analysis of air quality takes into account the implementation of the design features described in Section 2.1.4. Additionally, the impacts analysis of air quality takes into account the implementation of measures and actions described in Section 6.0.

4.14.1 Programmatic Environmental Impact Statement Impacts Summary

Potential impacts to air quality from a typical wind energy facility are described in Section 5.4 of the PEIS and are consistent with this project. Because this EA tiers to the PEIS, a brief summary of those impacts to air quality that are relevant to the Proposed Action is presented below. A summary of the related mitigation measures for air quality that have been fully analyzed in the PEIS is provided in Section 6.2 of this EA. The impacts and mitigation measures analyzed and described for the PEIS are herein incorporated into this document.

4.14.1.1 CONSTRUCTION

Impacts to air quality from construction equipment and activities associated with typical wind energy facilities are described in Section 5.4.2. Typically, air quality impacts modeling are not required because the impacts of construction projects are localized and temporary. Construction activities for a typical wind farm consist of the following: site access, clearing, and grading; foundation excavations and installations; WTG erection and nacelle and rotor installation; and miscellaneous ancillary construction.

Emissions generated during site access development and clearing activities typically include tailpipe emissions from vehicles, and the emissions from diesel equipment, such as bulldozers, scrapers, dump trucks, loaders, and rollers. Fugitive dust from disturbed soils would be a major source of particulate emissions. Blasting, if required, would produce small amounts of CO, nitrogen oxides, and particulates.

During typical foundation excavation and installation operations vehicle travel, grading, excavation, and backfilling would result in increased in fugitive dust. Diesel engines would be the primary source of tailpipe emissions. Additional emissions would result from increased vehicle operation and the operation of construction equipment and generators. Concrete batching would result in increased PM associated with truck travel and mixing concrete.

During WTG erection, typical emissions would include continued PM and tailpipe emissions as a result of increased vehicles. Construction activities would continue to result in fugitive PM from earthmoving, backfilling, and grading as well as the tailpipe emissions from construction equipment. Additionally, trenching for buried electrical lines would result in increased PM.

4.14.1.2 OPERATION

Operation of a typical wind energy facility would not result in adverse impacts to air quality. Operations consist of operation of the wind turbines and maintenance. Maintenance activities are typically limited to routine maintenance and major overhauls and repairs.

Operating WTGs do not produce direct emissions. Other operations would result in increased fugitive dust from road travel, vehicular exhaust, and brush clearing in addition to the tailpipe emissions associated with vehicle travel. These activities would be limited in extent and duration.

4.14.2 Proposed Action

4.14.2.1 CONSTRUCTION

Motorized construction vehicles that would be used during construction consist of delivery trucks, road graders, backhoes, bulldozers, track-mounted augers, and welding rigs. During construction, soil-disturbing activities, such as drilling and grading associated with the Proposed Action, would generate short-term increases in CO and PM_{10} emissions in the project area. Increases would occur during construction activities and from the use of gas powered generators and would be localized to the construction zone and project site (Table 4.14-1). Construction activities that would cause these increases would last no longer than 9 to 12 months and increases in CO and PM_{10} would not affect the attainment status of the project area.

Table 4.14-1. Pollutants and Factors Influencing Emissions

Activity	Pollutants	Factors	Spring Valley
Vehicle Traffic	CO, NO_x, volatile organic compounds (VOCs), particulates, SO_2, air toxics	Vehicle miles traveled (VMT)	
Equipment Delivery Trucks (6,402 round trips)			3,361,050 VMT
Construction Employee Vehicles (39,150 total round trips)			2,740,500 VMT
Water Delivery (2,000 round trips)			40,000 VMT
Fugitive Dust from Travel on Unpaved Roads	Particulates	VMT, road conditions (e.g., silt loading, silt content, moisture content, and vehicle weight)	
Fugitive Dust from Construction Activities	Particulates	Acres disturbed	336.9 acres
Construction Equipment Exhaust	CO, NO_x, VOCs, particulates, SO_2, air toxics	Volume of fuel used	
Concrete Batch Plant	Particulates	Volume of concrete produced	540 tons

Greenhouse gas emissions from the Proposed Action (e.g., emissions related to construction and transportation) would be relatively small compared to the 8,026 million tons of CO_2-equivalent GHGs emitted in the U.S. in 2007, and the 54 billion tons of CO_2-equivalent anthropogenic GHGs emitted globally in 2004.

4.14.2.2 OPERATION

The energy produced by the SWVEF would be free of both criteria air pollutants and GHGs. Additionally, the proposed SVWEF would generate electrical power from a renewable source of energy (wind). Accordingly, the SVWEF would produce a given amount of energy with fewer GHG emissions than a fossil fuel-burning power plant.

4.14.3 Alternate Development Alternative

4.14.3.1 CONSTRUCTION

Changes in air quality from construction activities associated with the Alternate Development Alternative would be similar to those described for the Proposed Action. There would be the same number of vehicle trips for both construction employees and materials delivery and the same mileage for new unpaved access roads. There would only be 325.4 acres disturbed under the Alternate Development Alternative.

4.14.3.2 OPERATION

Changes in air quality from the operation of the Alternate Development Alternative would be the same as those described for the Proposed Action. There would be same number of WTGs and the same number of long term operations and maintenance staff vehicles necessary as described under the Proposed Action.

4.14.4 No-Action Alternative

Under the No-Action Alternative, the BLM would not issue a ROW grant for the construction and operation of WTG facilities in the project area. Impacts to air quality would continue to be subject to existing conditions and trends. Casual vehicle travel on unpaved roads and wind blowing over un-vegetated areas would continue to result in increased dust and PM.

5.0 CUMULATIVE IMPACTS

Council on Environmental Quality (CEQ) regulations for implementing NEPA define cumulative impacts as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions (RFFA) regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR 1508.7).

BLM's NEPA Handbook states that the purpose of the cumulative effects analysis is to ensure the decision-makers consider the full range of the consequences of the Proposed Action, alternatives to the Proposed Action, and No-Action Alternative (BLM 2008c). Those resources that would be directly or indirectly affected by the Proposed Action, Alternate Development Alternative, and No-Action Alternative are analyzed below. If the actions under each alternative have no direct or indirect effect on a resource (as disclosed in Chapter 4, Environmental Consequences), then the cumulative impacts on that resource are not addressed below. The cumulative impacts from wind energy development projects are described in Section 6.14.1 of the PEIS: "To the extent that wind energy development projects on BLM administered lands occur at the rates and amounts projected as well as to the extent that the policies and BMPs described under the Proposed Action are applied, the impacts attributable to wind energy development would be marginal when compared with other anticipated ongoing activities" (BLM 2005:6-13). The SVWEF meets the BLM's policy for wind energy development and applies policies and BMPs from the PEIS as described Table 6.2-1; it therefore falls within the cumulative impacts analysis in the PEIS. To the extent that wind energy development occurs as projected in the PEIS, the impacts associated with that development would be marginal, compared with other anticipated ongoing activities. A more detailed description of site-specific cumulative impacts has been prepared for the SVWEF. The geographic area of cumulative impacts analysis is generally based on the natural boundaries of the resource affected. For all resources analyzed, a review of past, present, and reasonably foreseeable future actions was completed within the Spring Valley watershed boundary, a 581,214-acre area in Spring Valley between the Schell Creek Range to the west and the Snake Range to the east (Figure 5.0-1). The Spring Valley watershed is divided into three units for management purposes: 120A (South Spring Valley), 120B (Mid Spring Valley) and 120C (North Spring Valley). The proposed project area occurs in the Mid Spring Valley watershed. In addition, although it does not occur in the watershed, because of its proximity to the proposed SVWEF, the Wilson Creek Wind project is being considered for cumulative effects on bird and bat species. For socioeconomics, the cumulative impacts analysis area is all of White Pine County. For grazing, the cumulative impacts analysis area is limited to the extent of the Bastian Creek and Majors allotments. The cumulative impact analysis area is primarily undeveloped and used for grazing, recreation, roads, ROWs, and transmission corridors.

Table 5.0-1 summarizes past, present, and reasonably foreseeable future actions. Past actions are considered those that have occurred within the past 50 years. Present actions are considered those occurring at the time of this evaluation and during implementation of this Proposed Action. Future actions are those that are in planning stages with a reasonable expectation of occurring over the anticipated life of the project, including restoration following decommissioning, or the next 40 years. These actions were identified through correspondence with the Ely BLM District Office. CEQ regulations require that the impacts of the SVWEF be considered as part of any future project's cumulative impact analysis.

In any NEPA analysis, it is preferable to quantify the assessment of impacts on each affected resource. This is true for direct, indirect, and cumulative impacts. Where possible, the following analysis is quantified. Where quantification is not available, a meaningful and qualified judgment of cumulative effects is included to inform the public and the decision maker.

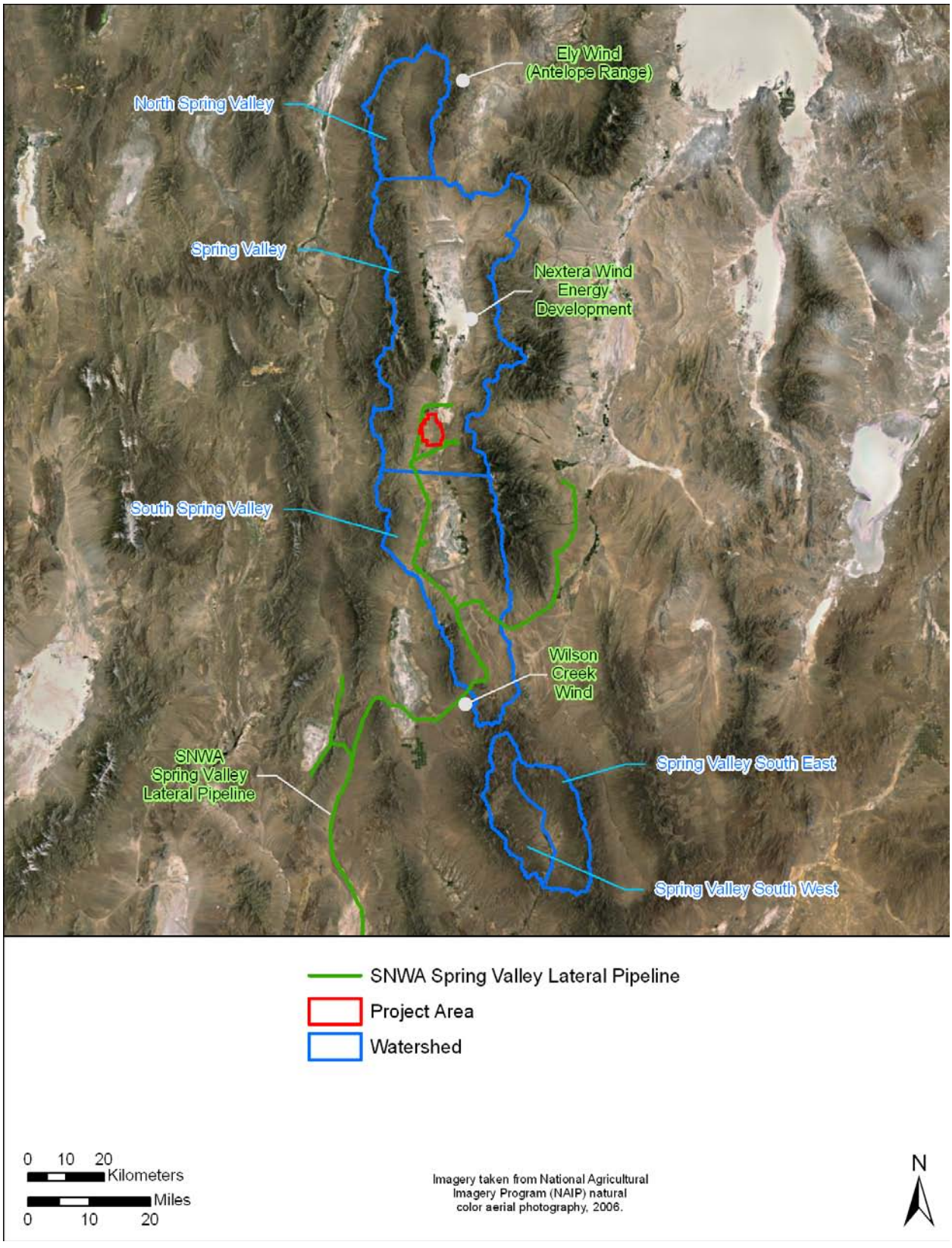

Figure 5.0-1. Cumulative impacts analysis area.

Table 5.0-1. Past, Present, and Reasonably Foreseeable Future Actions Considered for Cumulative Impact Analyses

Action	Description	Resources Affected	Area of Impact (acres)
Past Actions			
Grazing	Grazing has occurred throughout the cumulative impacts area on BLM, U.S. Forest Service, NPS, and private lands. Several range improvements have occurred within the watershed on grazing allotments to improve grazing management.	Wildlife and special-status species	118,388
Bastian Creek Vegetation Treatment		Wildlife, special-status species, grazing	575.9
Power Transmission and Distribution Lines	There are several transmission lines crossing the project area.	Visual resources, migratory birds, wildlife, and special-status species	242 (estimated)
Gravel Pits	There are several small gravel pits throughout Spring Valley.	Visual resources, wildlife	50 (estimated)
4-Wheeler Fire and Emergency Stabilization and Rehabilitation Treatment	Wildfire and aerial seeding emergency stabilization and rehabilitation treatment in Intermountain Basins Big Sagebrush, approximately 8 miles north of the project area.	Wildlife, special-status species	2,402
Wildfire	Eleven wildfires have occurred within the Spring Valley Watershed over the past 30 years. Because fire boundaries overlap, the total acreage burned is only an estimate.	Wildlife, special-status species	13,000 (estimated)
Present Actions			
Grazing	Grazing is currently occurring throughout the cumulative impacts area on BLM, U.S. Forest Service, NPS, and private lands. Grazing can result in impacts to vegetation and soils.	Wildlife and special-status species	Same as past actions
Sacramento Pass Wildland Urban Interface Project	Mechanical thinning and removal of pinyon and juniper trees.	Wildlife, special-status species	406
Reasonably Foreseeable Future Actions			
SNWA – Groundwater Development Project	SNWA has filed a ROW application with BLM to construct a water conveyance system to develop and transmit groundwater rights, which may be granted by the State Engineer from five basins in eastern Nevada for use in the Las Vegas Valley. Only a portion of that project located within Spring Valley is considered for cumulative analysis. Within Spring Valley, SNWA has proposed to construct buried pipelines, two pumping stations, and associated power facilities. SNWA also anticipates the construction of future groundwater production facilities throughout Spring Valley, possibly within the SVWEF project area. The BLM is currently preparing an EIS to analyze the impacts of SNWA's currently proposed ROWs. The Spring Valley lateral pipeline, and Spring Valley North pumping station and substation site would be located on the west side of SR 893. The lateral pipeline would end approximately 1 mile north of Bastian Creek, and the Spring Valley North pumping station and substation site would be located approximately 0.5 mile north of the power line corridor (SNWA 2010). Full build-out of the project is anticipated to be complete by 2050. Impacts to vegetation and springs in Spring Valley are anticipated to occur within 75 years after full build-out. Therefore, the construction and operation impacts of the project are being considered for cumulative impacts in this document. Long term impacts due to pumping cannot be quantified at this time, these impacts will be addressed in future NEPA documents associated with the water pipeline and wells.t.	All	2,310 acres (69 acres for permanent facilities)

Table 5.0-1. Past, Present, and Reasonably Foreseeable Future Actions Considered for Cumulative Impact Analyses (Continued)

Action	Description	Resources Affected	Area of Impact (acres)
Reasonably Foreseeable Future Actions, continued			
NextEra Wind Energy Development	A wind project proposed north of the Proposed Action would be constructed on approximately 20,000 acres within their 60,000-acre study area. Based on the SVWEF, a project of that size would use approximately one hundred fifty 2-MW turbines and generate up to 300 MW. Construction, operation, maintenance, and decommissioning are anticipated to be similar to the SVWEF. It is also anticipated that this project would require an aboveground transmission line from the project south to the NV Energy 230-kV transmission line. Typical ground disturbance (short and long term) associated with a project of that size would be around 10%, totaling 2,000 acres.	All (except grazing)	2,000 (estimated)
Grazing	It is reasonable that the grazing permits continue to be active and that cattle and sheep would be permitted to graze on public lands. Range monitoring would be expected to continue. Dozens of range permit renewals will occur in subsequent years. Adjustments to livestock use to maintain quality habit for greater sage grouse and various other special-status species may be determined through the grazing permit renewal process..	Wildlife and special-status species	Same as past and present actions
Ely Wind (Antelope Range)	Nevada Wind has proposed an up to 700-MW wind project on approximately 15,000 acres 75 miles north of the project area. Based on the SVWEF, a project of that size would use approximately three hundred fifty 2-MW turbines. Construction, operation, maintenance, and decommissioning activities are anticipated to be similar to the SVWEF. Typical ground disturbance (short and long term) associated with a project of that size would be around 10% of the total project area, totaling 1,500 acres.	All (except grazing)	1,500 (estimated)
Wilson Creek Wind	Wilson Creek Wind, LLC, has proposed an up to 990-MW three-phase wind project on approximately 31,000 acres 50 miles south of the project area. Based on the SVWEF, a project of that size would use approximately four hundred ninety-five 2-MW turbines. Construction, operation, maintenance, and decommissioning activities are anticipated to be similar to the SVWEF. It is also anticipated that this project would require an aboveground transmission line from the project west to an existing transmission line. Typical ground disturbance (short and long term) associated with a project of that size would be around 10% of the total project area, totaling 3,100 acres.	All (except grazing)	3,100 (estimated)

5.1 Wildlife

The cumulative impacts to wildlife, particularly birds and bats, from the construction and operation of wind energy facilities are an issue. The types of impacts that are of particular concern include direct mortality from collisions with WTGs, loss of habitat, and displacement. Past and present actions have contributed to injury, mortality, loss of habitat, habitat fragmentation, avoidance, and displacement. In particular, aerial features such as the transmission lines crossing Spring Valley have likely contributed to collisions and resulted in increased injury and mortality of both bird and bat species, including migratory bird species.

RFFAs over the next 40 years would be expected to result in the development of 6,600 acres of other wind energy facilities similar to the SVWEF, including up to one thousand 2-MW WTGs, and the disturbance to 2,310 acres in Spring Valley as part of the SNWA groundwater development project (see Table 5.0-1). These RFFAs would result in further mortality from collisions with WTGs and new distribution towers, barotraumas to bats from WTGs, loss of habitat, habitat fragmentation, and displacement of wildlife species.

The incremental impacts of the Proposed Action and Alternate Development Alternative, when added to these other actions, would contribute to additional injury and mortality of bird and bat species resulting from collisions with WTGs and associated facilities. It is assumed that the reasonably foreseeable wind energy projects would implement BMPs and mitigation measures to reduce the risks of bird and bat mortality. Implementation of mitigation measures from the Spring Valley ABPP in a phased approach would also further reduce the risk of increased mortality for both bird and bat species at the SVWEF (see Appendix F). Therefore, the addition of the SVWEF is expected to result in only a small percent increase in cumulative avian mortality. Cumulative impacts to bats are anticipated to be similar to those described for birds; however, because of the proximity to Rose Guano Bat cave, there is the potential for a somewhat larger percent increase in mortality for Brazilian free-tailed bats.

Construction, operation, and decommissioning of the SVWEF under the Proposed Action and Alternate Development Alternative would contribute to the development occurring within the cumulative impact analysis area (see Figure 5.0-1) over the next 40 years and the alteration of the landscape, resulting in declining habitat quality from increased development, the introduction of aerial features (i.e., WTGs, transmission structures), and habitat fragmentation.

Under the Proposed Action, there would be short-term disturbance of 337 acres and long-term ground disturbance of approximately 111 acres for the SVWEF. The RFFAs within Spring Valley would result in 5,810 acres of both short and long-term ground disturbance. The cumulative ground disturbance would represent 1% of available wildlife habitat in Spring Valley. Additionally, 75 WTGs would be installed in Spring Valley for the SVWEF. The RFFAs would result in up to 995 WTGs installed in the area of analysis, with approximately 225 WTGs in Spring Valley. SVWEF WTGs would be 7.5% of the anticipated total WTGs from the RFFAs described. It should also be noted that, although currently planned, 995 turbines would exceed the amount of generation needed for the area it can service and without major changes in generation needs and transmission capacity, it would not be commercially viable to develop all 995 turbines.

5.2 Special-Status Species

Cumulative impacts to special-status species would be similar to those described for fish and wildlife in Section 4.1. The types of impacts of particular concern for special-status species include direct mortality from collisions with buildings and aerial structures such as WTGs and transmission lines, barotraumas, loss of habitat, and displacement. Past and present actions have contributed to injury, mortality, loss of habitat, habitat fragmentation, avoidance, and displacement. In particular, aerial features such as the transmission lines crossing Spring Valley have likely contributed to collisions and increased injury and mortality of special-status raptors, shorebirds, songbirds, and bat species. Additionally, past and present actions have contributed to the direct loss of habitat for the greater sage-grouse and pygmy rabbit and habitat fragmentation for those species.

RFFAs in the area of analysis over the next 40 years would result in the development of 995 WTGs (approximately 225 WTGs in Spring Valley), and 71 miles of new overhead power line in Spring Valley as part of the SNWA groundwater development project (see Table 5.0-1). These RFFAs would result in further mortality from collisions with WTGs and transmission facilities. Because of the great distances

Brazilian free-tailed bats are known to migrate and the addition of multiple wind energy facilities to the north and south of the SVWEF, there is the potential for a somewhat larger percent increase in mortality for Brazilian free-tailed bats throughout eastern Nevada. RFFAs within Spring Valley would contribute up to 5,810 acres of short- and long-term habitat loss and even greater habitat fragmentation for the greater sage-grouse and pygmy rabbit. With the addition of the Proposed Action, this represents approximately 3.3% of available greater sage-grouse habitat and 3.3% of potential pygmy rabbit habitat in Spring Valley.

The incremental impacts of the Proposed Action, when added to these other actions, would contribute to additional injury and mortality of special-status raptor, shorebird, songbird, and bat species resulting from collisions with WTGs. Research regarding avian mortalities associated with WTGs estimates that between 0.01% and 0.02% of total avian mortalities resulting from collisions with human structures can be attributed to WTGs (Erickson et al. 2001). The addition of the Proposed Action is expected to contribute a small percent increase in cumulative avian mortality. Construction, operation, and decommissioning of the SVWEF under the Proposed Action and Alternate Development Alternative would contribute to the alteration of the landscape resulting in declining habitat quality from increased development, the introduction of aerial features (i.e., WTGs, transmission structures), and habitat fragmentation. The RFFAs would result in up to 995 WTGs installed in the area of analysis. Under the Proposed Action and Alternate Development Alternative, 75 WTGs would be installed in Spring Valley. These WTGs would be 7.5% of the potential total WTGs from the RFFAs described. It should also be noted that, although currently planned, 995 turbines would exceed the amount of generation needed for the area it can service and without major changes in generation needs and transmission capacity, it would not be commercially viable to develop all 995 turbines.

5.3 Grazing Uses

The area of analysis for livestock grazing includes the Majors and Bastian Creek Grazing allotments as described in Section 3.4. Together, they consist of 118,388 acres with permitted use of 14,313 AUMs. The past and present land uses in the allotments have had a direct effect on extent of grazing in the area. Historic grazing, drought, fire suppression, utility development, roads, and dispersed recreation have encroached on lands used for grazing and reduced the amount of land and forage available for cattle on both allotments. The Bastian Creek restoration area project resulted in improved forage on 575.9 acres of the Bastian Creek Allotment.

RFFAs would result in further changes to the vegetation communities that are used for cattle grazing in the allotments. Construction of SNWA's groundwater development project would result in disturbance to approximately 627 acres within the Majors allotment. The other RFFA wind energy developments do not occur within these allotments. Construction of the Proposed Action would result in the short- and long-term disturbance to 488 acres, which cumulatively with the groundwater development project would result in disturbance to 1,075 acres of surface disturbance in the two allotments, or 0.9% of the allotments. The majority of that disturbance would be restored and available for grazing when restoration levels described in Appendix A are achieved.

Operation of the SVWEF under the Proposed Action and Alternate Development Alternative would result in the removal of up to 111 acres available for grazing from the Allotments in the long term, including 19.4 acres in the Majors Allotment and 91.6 acres in the Bastian Creek Allotment. The groundwater development project would result in the removal of 6 acres from grazing as a result of long term facilities within these grazing allotments. Cumulatively, operation of these projects would result in the long-term loss of 117 acres within the two allotments, or 0.1% of the allotments.

5.4 Water Resources

The area of analysis for water resources is Spring Valley. Past and present land uses in Spring Valley have directly affected water resources. Construction of roads, utilities, and the development of lands for agricultural purposes have resulted in surface and vegetation disturbances that affect drainages and floodplains. Construction of these various developments has resulted in vegetation removal and leveling of landforms that has resulted in filling and re-routing of surface water drainages, alteration of floodplains, and increased sedimentation. In addition, construction of irrigation features and stock watering facilities has created surface waters. While parts of Spring Valley have been developed for human uses, with the resulting impacts to surface drainages and floodplains, large parts of Spring Valley remain undeveloped and are characterized by unaltered, or less altered, surface water flow and function.

RFFAs over the next 40 years within Spring Valley would be expected to result in the disturbance to 3,500 acres from other wind energy facilities similar to the SVWEF, and 2,310 acres as part of the SNWA groundwater development project (see Table 5.0-1). Development of the 3,100-acre Wilson Creek Wind Energy Facility would not contribute cumulatively to changes in surface drainages and groundwater in Spring Valley. The remaining RFFAs along with the Proposed Action, totaling approximately 6,258 acres, would cumulatively contribute to further changes to surface drainages and floodplains in Spring Valley. All ground-disturbing projects would be required to obtain necessary federal and state and permits for disturbance to drainages, and implement required mitigation and restoration measures.

5.5 Cultural Resources

The area of analysis for cumulative impacts for cultural resources is Spring Valley, as described above. The past and present land uses in Spring Valley have had a direct effect on cultural resource values in the area. Direct effects have included the loss, disturbance, theft, and burial of cultural artifacts and sites, as well as the modification and alteration of the setting of cultural sites and resources. Although surveys are conducted prior to development on state and federal lands to determine the presence of cultural resources sites eligible for listing in the NRHP (Section 106 of the NHPA), information may not be captured or sites may not be protected from disturbance on private lands. All eligible sites found would be avoided.

The development of private and public lands for multiple purposes has led to the recordation of information about previous cultures that occupied or traveled through the Spring Valley. Development of these lands has led to the collection of information about previous cultures but also the physical loss of cultural resource sites in Spring Valley.

Reasonably foreseeable development in Spring Valley over the next 40 years would be expected to result in the disturbance of 3,500 acres from other wind energy facilities similar to the SVWEF and 2,310 acres as part of the SNWA groundwater development project (see Table 5.0-1). These developments along with the short- and long-term disturbance from the Proposed Action and the Alternate Development Alternative would result in the cumulative disturbance of 6,258 acres and associated impacts to cultural resources in Spring Valley. Surveys prior to construction would identify the presence of cultural resources and eligible sites prior to surface disturbance for construction. These surveys would provide for mitigation measures needed to capture the information these sites provide before construction and disturbance or removal of the affected sites. While physical sites would be lost, the information these sites provide about previous cultures would be recorded before construction. Ultimately, the result would be the collection of additional information about previous cultures and sites but the loss of the physical presence of other sites. The BLM’s policy is to avoid cultural resource sites and only instigate mitigation in the form of excavation when there is no way to avoid the site.

Construction, operation, and decommissioning of the SVWEF under the Proposed Action and Alternate Development Alternative would contribute to the development occurring over the next 40 years and the alteration of the landscape in Spring Valley. Under both alternatives, up to 111 acres of open rangelands would be disturbed in the long term for construction of the SVWEF. The cumulative disturbance along with the other RFFAs represents disturbance to approximately 1% of Spring Valley.

5.6 Native American Concerns

The area of analysis for cumulative impacts for Native American concerns is Spring Valley, as described above. The past and present land uses in Spring Valley have had a direct effect on Native American concerns in the area. Direct effects are similar to those described under cultural resources and have included the loss, disturbance, theft, and burial of cultural artifacts and sites, as well as the modification and alteration of the prehistoric and historic setting of the Spring Valley ACEC. The BLM completed tribal consultation to determine the types of concerns present in Spring Valley.

Reasonably foreseeable development in Spring Valley over the next 40 years would be expected to result in the short and long term disturbance to 3,500 acres from other wind energy facilities similar to the SVWEF and 2,310 acres as part of the SNWA groundwater development project (see Table 5.0-1). These developments along with the short- and long-term disturbance from the Proposed Action and the Alternate Development Alternative would result in the cumulative disturbance of 6,258 acres in Spring Valley. Each of these projects would undergo tribal consultation to address Native American concerns.

Construction, operation, and decommissioning of the SVWEF under the Proposed Action and the Alternate Development Alternative would contribute to the development within Spring Valley occurring over the next 40 years and the alteration of the prehistoric and historic setting surrounding the Swamp Cedar ACEC. Under both alternatives, up to 111 acres of currently undisturbed lands would be altered by the SVWEF in the long term. Disturbance from the alternatives would equate to 1.6% of the anticipated cumulative landscape disturbance from all RFFAs described. The construction and presence of the SVWEF would also contribute to contrasts with the existing landscape that contributes to the relevance of the prehistoric and historic setting of the ACEC.

5.7 Visual Resources

Spring Valley is a mixture of BLM, NPS, U.S. Forest Service, and private lands. Public lands managed by BLM are used for a variety of purposes including dispersed recreation, livestock grazing, and utility corridors for electric transmission lines. These are lands that are managed for some degree of landscape change to provide for uses that alter the characteristic landscape. Lands in Spring Valley are also managed for retention of undeveloped landscapes, including GBNP, Mount Moriah Wilderness, and High Schells Wilderness. Private lands in Spring Valley are primarily used for ranching, agricultural, and residential purposes. The lands in Spring Valley are a mixture of undeveloped landscapes, interspersed with roads, utility lines, public purposes, and widely dispersed ranches and residences that alter the land and its character. The past and present land uses in Spring Valley have resulted in the current landscape character of the area.

RFFAs over the next 40 years would be expected to result in the short- and long-term disturbance of 3,500 acres from other wind energy facilities similar to the SVWEF and 2,310 acres as part of the SNWA groundwater development project (see Table 5.0-1). A majority of the SNWA groundwater development project disturbance would be buried facilities and temporary construction disturbance that would be restored following construction (SNWA 2010). These developments of public land would result in further

alteration and development of a landscape that is a mixture of undeveloped lands, open rangelands, ranches, utilities, roads and highways.

Construction, operation, and decommissioning of the SVWEF under the Proposed Action and the Alternate Development Alternative would contribute to the development occurring over the next 40 years and the alteration of the landscape in Spring Valley. Under both alternatives, up to 111 acres of open rangelands would be occupied by aboveground facilities in the long term for the SVWEF. It is estimated that the other wind energy RFFAs in Spring Valley would have up to 350 acres (10% of project areas) occupied by aboveground facilities in the long term. The SNWA groundwater development facilities would have an estimated 69 acres of aboveground facilities in Spring Valley (SNWA 2010). The cumulative long-term disturbance to the landscape in Spring Valley from the Proposed Action and the Alternate Development Alternative and RFFAs in Spring Valley would be 530 acres, which represents 0.1% of the Spring Valley watershed.

The wind energy RFFAs in Spring Valley would include lighting on WTGs as required by the FAA. SNWA groundwater development aboveground facilities would include some lighting for security purposes. These artificial light sources combined with the lighting associated with the Proposed Action and the Alternate Development Alternative are not expected to contribute to sky glow greater than the existing night sky conditions. There would be an increase in visible artificial lights to people traveling the roads through Spring Valley at night.

5.8 Noise

There are currently very few area-wide noise sources from past and present actions that are noteworthy (such as local traffic and agricultural sources).

RFFAs within Spring Valley would contribute to overall noise levels during construction and operation activities. Short-term changes in ambient noise levels would occur during construction, but construction schedule information is not yet available for the other wind energy RFFAs to determine if the projects would be under construction simultaneously. The operation of an estimated cumulative total of 575 WTGs in Spring Valley may increase ambient noise levels; however, it is not possible to quantify the increase in dBAs for these other projects because there are no specific development plans available. It is anticipated however that for each project increases in ambient noise levels would be similar to the SVWEF. The SNWA groundwater development project Spring Valley north and south pumping stations are enclosed facilities, and are expected to generate less than 52 dBA at 500 feet from the facility buildings (Lisa Luptowitz, Southern Nevada Water Authority, personal communication 2010).

Construction and operation of the SVWEF under the Proposed Action and the Alternate Development Alternative would contribute to the increase in noise levels, especially during the construction phase. Under both alternatives, increases in noise levels during construction would range from 40 to 62 dBAs at 50 feet. Increases in noise levels during operation of the SVWEF would range from 40 to 55 dBAs. Construction and operation of the SVWEF under any of the alternatives would contribute noise to the area of analysis over the next 40 years, further reducing the quiet nature of the existing environment.

5.9 Transportation

Primary transportation corridors (local two-lane roadways) consist of SR 893, U.S. 93, and U.S. 50. There are also several dirt surface roads and OHV trails located on BLM lands and along the BLM-designated utility corridors. The past and present land uses have had a direct effect on the transportation in Spring Valley. However, traffic levels remain low and there is no traffic congestion.

RFFAs over the next 40 years in Spring Valley would be expected to result in the development of 575 WTGs similar to the SVWEF, and buried pipelines, pumping stations, power lines, and other facilities as part of the SNWA groundwater development project (see Table 5.0-1). Construction of each of these projects would result in short-term increases to the traffic volume, especially as a result of commuting and component delivery during construction and may result in delays in access. However, construction schedule information is not yet available for the other wind energy RFFAs to determine if the projects would be under construction simultaneously.

Construction and operation of the SVWEF under the Proposed Action and the Alternate Development Alternative would contribute to the increase in traffic volume. There would be an increase of 150 vehicle trips to and from the construction site twice per day (a.m. and p.m.) in the short term. Although construction of the SVWEF under these alternatives would contribute to the increases in traffic in Spring Valley, traffic would return to existing levels during operations.

5.10 Lands Uses and Special Designations

The past and present land uses in Spring Valley have had a direct effect on the conversion of lands from one use to another. Land in Spring Valley is largely undeveloped and is characterized by open rangelands, and by areas used for grazing, utilities, recreation, and widely dispersed private ranches. The existing corridor through the project area has been converted to utility uses. Grazing still occurs on public land within Spring Valley.

RFFAs over the next 40 years in Spring Valley would be expected to result in the short- and long-term disturbance to 3,500 acres from other wind energy facilities similar to the SVWEF and 2,310 acres as part of the SNWA groundwater development project (see Table 5.0-1). These developments are assumed for this analysis to be compatible with BLM designated land uses in Spring Valley. None of the RFFAs would overlap ACECs.

Under the Proposed Action and the Alternate Development Alternative, the SVWEF would convert 111 acres from open rangelands to a developed site in the long term. The other RFFAs in Spring Valley would convert 419 acres to developed sites, cumulatively resulting in 530 acres of land unavailable for new land uses in Spring Valley.

5.11 Recreation

The Loneliest Highway SRMA is managed for a wide variety of recreational uses and opportunities. The SRMA within Spring Valley and the adjacent mountain ranges provide opportunities for dispersed recreation, including camping, hunting, wildlife observation, hiking, and backcountry driving. Additionally, GBNP provides opportunity for solitude and for primitive forms of recreation activities. Utilities and roads have lead to surface disturbances and clearing of vegetation, although the majority of the area remains rural and primitive in character.

RFFAs over the next 40 years in Spring Valley would be expected to result in the short- and long-term disturbance to 3,500 acres from other wind energy facilities similar to the SVWEF and 2,310 acres as part of the SNWA groundwater development project (see Table 5.0-1). These developments of public land would result in the loss of dispersed recreation opportunities within the Loneliest Highway SRMA, including hunting opportunities within Game Management Unit 111. Additionally, the development of these lands would impact the rural and primitive setting typical of Spring Valley and the surrounding mountain ranges.

Construction and operation of the SVWEF under the Proposed Action and the Alternate Development Alternative would contribute to development over the next 40 years and the alteration of the characteristic rural and primitive setting and reduction of opportunities for dispersed recreation activities. Under the both alternatives, up to 111 acres would be occupied by facilities for the SVWEF in the long term. As described in Section 5.7 above, the cumulative long-term disturbance to the landscape in Spring Valley from facilities associated with the Proposed Action and the Alternate Development Alternative and RFFAs in Spring Valley would be 530 acres, which represents 0.1% of Spring Valley.

5.12 Socioeconomics

The cumulative area of analysis for socioeconomics is White Pine County. The past and present land uses in the area of analysis have had a direct effect on the socioeconomics of the county through changes to employment and tax revenue. Past and present actions have resulted in the current socioeconomic conditions in the county, as described in Chapter 3.

In general, implementation of RFFAs would create positive, temporary impacts on local economies and increased employment opportunities. RFFAs would be expected to draw partially on the available construction workforce in the county. Concurrent construction of similar (reasonably foreseeable) projects in the future could result in a demand for labor that cannot be met with local residents, which could lead to an influx of non-local workers. This population increase could impact socioeconomic conditions and public services and utility. In addition, the RFFAs would result in increased contributions to White Pine County personal property tax revenue.

Construction and operation of SVWEF under the Proposed Action and the Alternate Development Alternative would contribute to tourism within White Pine County. Under both alternatives, SVWEF would be the first wind energy facility to be constructed in Nevada. Construction and operation of other reasonably foreseeable future wind energy facilities following the first in White Pine County would contribute incrementally to that tourism draw.

5.13 Air Quality

The cumulative area of analysis for air quality is Spring Valley. The past and present land uses in the area of analysis have had a direct effect on the air quality of Spring Valley through increased dust from emissions resulting from surface-disturbing actions. There are currently few air pollutant emissions from past and present actions that are noteworthy (such as local vehicle traffic).

RFFAs within Spring Valley would affect air quality during construction and operation activities. Short-term changes in air quality would occur during construction, but construction schedule information is not yet available for the other wind energy RFFAs to determine if the projects would be under construction simultaneously. The operation of an estimated cumulative total of 575 WTGs in Spring Valley would not contribute to GHGs. The energy produced by the SWVEF and other wind energy RFFAs would be free of both criteria air pollutants and GHGs. Accordingly, the SVWEF and wind energy RFFAs would produce a given amount of energy with fewer GHG emissions than a fossil fuel-burning power plant. It is not possible to quantify the increase in other criteria pollutants from vehicle and equipment emissions for these other projects because there are no specific development plans available. The SNWA groundwater development project Spring Valley north and south pumping stations would not result in a change in the attainment status for criteria pollutants in Spring Valley.

Construction and operation of the SVWEF under the Proposed Action and the Alternate Development Alternative would contribute to the increase in vehicle emissions. Under both alternatives, there would be

an increase in emission from 150 vehicle trips to and from the construction site twice per day (a.m. and p.m.) in the short term. Although construction of the SVWEF under these alternatives would contribute to the increases in vehicle emissions in Spring Valley, traffic and emissions would return to existing levels during operations. GHG emissions from the Proposed Action (e.g., emissions related to construction and transportation) would be relatively small compared to the 8,026 million tons of CO_2-equivalent GHGs emitted in the U.S. in 2007, and the 54 billion tons of CO_2-equivalent anthropogenic GHGs emitted globally in 2004.

6.0 MITIGATION MEASURES

6.1 Mitigation Overview

Numerous design features are included as part of the Proposed Action (see Section 2.1.4), which include the ABPP, the Restoration and Weed Management Plan, and other plans presented in Appendices A though G. Additionally, the PEIS has provided an extensive list of mitigation measures described in Table 6.1-1 and BMPs (BLM 2005: Section 2.2.3.2), and the Ely RMP/FEIS Appendix F, Section 3 (BLM 2008a), provides additional mitigation measures for wind developments. Those documents have been incorporated by reference; therefore, most mitigation measures have been previously developed and analyzed and are incorporated for the Proposed Action and Alternate Development Alternative. The measures in Section 6.5 below were developed to mitigate site-specific impacts resulting from the Proposed Action and/or Alternate Development Alternative that were not addressed in the PEIS and RMP/FEIS measures or as part of the design features. If implemented, these measures in combination with the design features and relevant PEIS and RMP/FEIS measures would eliminate or substantially reduce all potential impacts as described for each resource throughout chapter four of the EA. A third-party construction monitor approved by the BLM would be employed by the proponent to ensure compliance with all BMPs, mitigation measures, and conservation measures identified.

6.2 Programmatic Environmental Impact Statement Adopted Mitigation Measures

The following table outlines the measures set forth in Chapter 5 of the PEIS and indicates which measures are incorporated into the EA, along with a rationale regarding why or why not. All of the mitigation measures from the PEIS were fully analyzed in that document. As described in the mitigation section of the PEIS (BLM 2005:5-112), an assessment of the effectiveness of the programmatic BMPs at mitigating potential impacts, along with an assessment of other aspects of the proposed Wind Energy Development Program, is presented in Chapter 6. In accordance with the PEIS, the mitigation measures of the PEIS may be consulted in determining site-specific requirements (BLM 2005), but they are not required.

6.3 Ely RMP/FEIS-adopted Mitigation Measures

The following mitigation measure is provided in the Ely RMP/FEIS (BLM 2008a:Section 4.29) to address potential impacts from loss of wildlife habitat as a result of energy production and mineral development and is incorporated herein.

Wildlife habitat should be enhanced (based on the acres disturbed/lost) in another area away from the energy or mineral project site. Enhancement would be performed on a case-by-case basis in accordance with NEPA, and funding would be provided by the Proponent. Improving wildlife habitat away from the project site would provide quality habitat for those animals that are displaced by the project. This would reduce impacts to wildlife populations in the development area. This measure has been incorporated into the ABPP (see Appendix F) as a phased mitigation measure.

Table 6.1-1. PEIS Mitigation Rationale

Resource / Mitigation	Is Mitigation Incorporated Into EA? (Y/N)	Rationale
5.1 Geologic Resources (BLM 2005:5-5 to 5-6)		
The size of disturbed land should be minimized as much as possible. Existing roads and borrow pits should be used as much as possible.	Y	Whenever possible, existing roads, such as the main north-south access road, would be used and improved to avoid additional disturbance. Additionally, access to Gravel Pit B outside the project area would be along an existing road.
Topsoil removed during construction should be salvaged and reapplied during reclamation. Disturbed soils should be reclaimed as quickly as possible or protective covers should be applied.	Y	Topsoil salvage and protection is described in the Restoration and Weed Management Plan (see Appendix A).
Erosion controls that comply with county, state, and federal standards should be applied. Practices such as jute netting, silt fences, and check dams should be applied near disturbed areas.	Y	An SWPPP and SPP (see Appendix D) have been prepared to ensure compliance with all county, state, and federal standards.
On-site surface runoff control features should be designed to minimize the potential for increased localized soil erosion. Drainage ditches should be constructed where necessary but held to a minimum. Potential soil erosion should be controlled at culvert outlets with appropriate structures. Catch basins, drainage ditches, and culverts should be cleaned and maintained regularly.	Y	SWPPP and SPP (see Appendix D).
Operators should identify unstable slopes and local factors that can induce slope instability (such as groundwater conditions, precipitation, earthquake activities, slope angles, and dip angles of geologic strata). Operators also should avoid creating excessive slopes during excavation and blasting operations. Special construction techniques should be used where applicable in areas of steep slopes, erodible soil, and stream channel/wash crossings.	Y	SWPPP and SPP (see Appendix D).
Borrow material should be obtained only from authorized and permitted sites.	Y	Gravel Pits A and B within and adjacent to the project area have been identified by a construction contractor in coordination with the BLM and would be permitted through a mineral materials permit issued by the BLM.
Access roads should be located to follow natural contours of the topography and minimize side hill cuts.	Y	Because the slope throughout the project area is less than 10%, there is no need for side hill cuts during road construction.
Foundations and trenches should be backfilled with originally excavated materials as much as possible. Excavation material should be disposed of only in approved areas to control soil erosion and to minimize leaching of hazardous constituents. If suitable, excess excavation materials may be stockpiled for use in reclamation activities.	Y	Use of fill material for reclamation and fill disposal location is described in the Proposed Action.
5.2 Paleontological Resources (BLM 2005:5-9)		
Operators should determine whether paleontological resources exist in a project area on the basis of the sedimentary context of the area, a records search for past paleontological finds in the area, and/or a paleontological survey.	Y	Paleontological resources were determined to be of low probability for the site.
A Paleontological Resources Management Plan should be developed for areas where there is a high potential for paleontological material to be present. Management options may include avoidance, removal of the fossils, or monitoring. If the fossils are to be removed, a mitigation plan should be drafted that identifies the strategy for collection of the fossils in the project area. Often, it is unrealistic to remove all of the fossils, in which case a sampling strategy can be developed. If an area exhibits a high potential but no fossils were observed during surveying, monitoring could be required. A qualified paleontologist should monitor all excavation and earthmoving in the sensitive area. Whether the strategy chosen is excavation or monitoring, a report detailing the results of the efforts should be produced.	N	Not applicable.
If an area has a strong potential for containing fossil remains and those remains are exposed on the surface for potential collection, steps should be taken to educate workers and the public on the consequences of unauthorized collection on public lands.	N	Not applicable.
5.3 Water Resources (BLM 2005:5-12 to 5-13)		
The size of cleared and disturbed lands should be minimized as much as possible. Existing roads and borrow pits should be used as much as possible.	Y	Whenever possible, existing roads, such as the main north-south access road, would be used and improved to avoid additional disturbance. Additionally, access to the Gravel Pit B outside the project area would be along an existing road.
Topsoil removed during construction should be salvaged and reapplied during reclamation. Disturbed soils should be reclaimed as quickly as possible or protective covers should be applied.	Y	Incorporated into the Restoration and Weed Management Plan (see Appendix A).
Operators should identify unstable slopes and local factors that can induce slope instability (such as groundwater conditions, precipitation, earthquake activities, slope angles, and dip angles of geologic strata). Operators also should avoid creating excessive slopes during excavation and blasting operations. Special construction techniques should be used where applicable in areas of steep slopes, erodible soil, and stream channel/wash crossings.	Y	Incorporated into the SWPPP and SPP (see Appendix D).
Erosion controls that comply with county, state, and federal standards should be applied. Practices such as jute netting, silt fences, and check dams should be applied near disturbed areas.	Y	Incorporated into the SWPPP and SPP (see Appendix D).
Operators should gain a clear understanding of the local hydrogeology. Areas of groundwater discharge and recharge and their potential relationships with surface water bodies should be identified.	Y	A hydrogeology study and report describing this information was prepared (Kleinfelder 2010).
Operators should avoid creating hydrologic conduits between two aquifers during foundation excavation and other activities.	Y	A hydrogeology study and report describing this information was prepared (Kleinfelder 2010). This would be implemented during final engineering of foundation sites following site-specific geotechnical analysis.
Proposed construction near aquifer recharge areas should be closely monitored to reduce the potential for contamination of said aquifer. This may require a study to determine localized aquifer recharge areas.	N	Not applicable. A hydrogeology study and report describing this information was prepared (Kleinfelder 2010). Aquifer recharge occurs at the higher elevations of the Schell Creek and Snake ranges and along the upper alluvial fans outside the project area.
Foundations and trenches should be backfilled with originally excavated material as much as possible. Excess excavated material should be disposed of only in approved areas.	Y	Incorporated into Proposed Action and Alternate Development Alternative and into the Restoration and Weed Management Plan (see Appendix A).

Table 6.1-1. PEIS Mitigation Rationale (Continued)

Resource / Mitigation	Is Mitigation Incorporated Into EA? (Y/N)	Rationale
5.3 Water Resources (BLM 2005:5-12 to 5-13)		
Existing drainage systems should not be altered, especially in sensitive areas such as erodible soils or steep slopes. When constructing stream or wash crossings, culverts or water conveyances for temporary and permanent roads should be designed to comply with county standards, or if there are no county standards, to accommodate the runoff of a 10-year storm. Potential soil erosion should be controlled at culvert outlets with appropriate structures. Catch basins, roadway ditches, and culverts should be cleaned and maintained regularly.	Y	Built into the Proposed Action and included in the SWPPP and SPP (see Appendix D).
On-site surface runoff control features should be designed to minimize the potential for increased localized soil erosion. Drainage ditches should be constructed where necessary but held to a minimum. Potential soil erosion should be controlled at culvert outlets with appropriate structures. Catch basins, drainage ditches, and culverts should be cleaned and maintained regularly.	Y	Incorporated into SWPPP and SPP (see Appendix D).
Pesticide use should be limited to non-persistent, immobile pesticides and should only be applied in accordance with label and application permit directions and stipulations for terrestrial and aquatic applications.	N	Pesticides are not anticipated to be used during construction or operation of the SVWEF. If pesticides must be used, SVW would coordinate with the BLM.
5.4 Air Quality (BLM 2005: 5-19 to 5-20)		
Mitigation measures for areas subject to vehicular travel		
Access roads and on-site roads should be surfaced with aggregate materials, wherever appropriate.	Y	Addressed in development of the Proposed Action and Alternate Development Alternative. Section 2.1.1.2.6:
Dust abatement techniques should be used on unpaved, unvegetated surfaces to minimize airborne dust	Y	Addressed in development of the Proposed Action and Alternate Development Alternative.
Speed limits should be posted (e.g., 25 mph) and enforced to reduce airborne fugitive dust.	Y	Incorporated into the Traffic Management Plan (see Appendix B) as a BMP.
Mitigation measures for soil and material storage and handling		
Workers should be trained to handle construction material to reduce fugitive emissions.	Y	Incorporated herein as a project-specific BMP.
Construction materials and stockpiled soils should be covered if they are a source of fugitive dust.	Y	Incorporated herein as a project-specific BMP.
Storage piles at concrete batch plants should be covered if they are a source of fugitive dust	Y	Incorporated herein as a project-specific BMP.
Mitigation measures for clearing and disturbing land		
Disturbed areas should be minimized.	Y	Built into Proposed Action and Alternate Development Alternative.
Dust abatement techniques should be used as earthmoving activities proceeding and prior to clearing.	Y	Incorporated herein as a project-specific BMP.
Mitigation measures for earthmoving		
Dust abatement techniques should be used before excavating, backfilling, compacting, or grading.	Y	Incorporated herein as a project-specific BMP.
Disturbed areas should be revegetated as soon as possible after disturbance.	Y	The Restoration and Weed Management Plan (see Appendix A) indicates that revegetation should be initiated following the completion of earthwork.
Mitigation measures for soil loading and transport		
Soil should be moist while being loaded into dump trucks.	Y	Incorporated herein as a project-specific BMP.
Soil loads should be kept below the freeboard of the truck.	Y	Incorporated herein as a project-specific BMP.
Drop heights should be minimized when loaders dump soil into trucks.	Y	Incorporated herein as a project-specific BMP.
Gate seals should be tight on dump trucks.	Y	Incorporated herein as a project-specific BMP.
Dump trucks should be covered before traveling on public roads.	Y	Incorporated herein as a project-specific BMP.
Mitigation measure for blasting		
Dust abatement techniques should be used during blasting.	N	No blasting would occur. Not applicable.
5.5 Noise Impacts (BLM 2005:5-27)		
Proponents of a wind energy development project should take measurements to assess the existing background noise levels at a given site and compare them with the anticipated noise levels associated with the proposed project (Section 4.5.2).	N	Due to site conditions, standard existing noise estimates were used and compared with anticipated noise levels.
Noisy construction activities (including blasting) should be limited to the least noise-sensitive times of day (daytime only between 7 a.m. and 10 p.m.) and weekdays.	Y	Incorporated herein as a project-specific BMP.
Whenever feasible, different noisy activities (e.g., blasting and earthmoving) should be scheduled to occur at the same time since additional sources of noise generally do not add a significant amount of noise. That is, less frequent noisy activities would be less annoying than frequent less noisy activities.	Y	Incorporated herein as a project-specific BMP.
All equipment should have sound-control devices no less effective than those provided on the original equipment. All construction equipment used should be adequately muffled and maintained.	Y	Incorporated herein as a project-specific BMP.
All stationary construction equipment (i.e., compressors and generators) should be located as far as practicable from nearby residences.	Y	Built into Proposed Action and Alternate Development Alternative.
If blasting or other noisy activities are required during the construction period, nearby residents should be notified in advance.	Y	Incorporated herein as a project-specific BMP.

Table 6.1-1. PEIS Mitigation Rationale (Continued)

Mitigation	Is Mitigation Incorporated Into EA? (Y/N)	Rationale
5.6 Transportation Impacts (BLM 2005:5-29 to 5-30)		
Existing BLM standards regarding road design, construction, and maintenance are described in the BLM Manual 9113 (BLM 1985) and the Gold Book (. An access road siting and management plan should be prepared incorporating these standards, as appropriate. Generally, roads should be required to follow natural contours; be constructed in accordance with standards as described in BLM Manual 9113; and be reclaimed to BLM standards. As described in BLM Manual 9113, BLM roads should be designed to an appropriate standard no higher than necessary to accommodate their intended functions.	Y	Built into the Proposed Action and Alternate Development Alternative.
Existing roads should be used to the maximum extent possible, but only if in safe and environmentally sound locations. If new access roads are necessary, they should be designed and constructed to the appropriate standard no higher than necessary to accommodate their intended functions (e.g., traffic volume and weight of vehicles). Abandoned roads and roads that are no longer needed should be recontoured and revegetated.	Y	Use of existing roads has been built into the Proposed Action and Alternate Development Alternative. Standards for new road construction are incorporated into the Traffic Management Plan (see Appendix B).
A transportation plan should be developed, particularly for the transport of turbine components, main assembly cranes, and other large pieces of equipment. The plan should consider specific object sizes, weights, origin, destination, and unique handling requirements and should evaluate alternative transportation approaches (e.g., barge or rail). In addition, the process to be used to comply with unique state requirements and to obtain all necessary permits should be clearly identified.	Y	A project-specific Transportation Plan/ route study would be completed by the turbine vendor following purchase. A Traffic Management Plan, including requirements for the route study, is included in Appendix B.
A Traffic Management Plan should be prepared for the site access roads to ensure that no hazards would result from the increased truck traffic and that traffic flow would not be adversely impacted. This plan should incorporate measures such as informational signs, flaggers when equipment may result in blocked throughways, and traffic cones to identify any necessary changes in temporary lane configuration. Signs should be placed along roads to identify speed limits, travel restrictions, and other standard traffic control information. To minimize impacts on local commuters, consideration should be given to limiting construction vehicles traveling on public roadways during the morning and late afternoon commute time.	Y	A Traffic Management Plan has been prepared and is included in Appendix B.
Project personnel and contractors should be instructed and required to adhere to speed limits commensurate with road types, traffic volumes, vehicle types, and site-specific conditions, to ensure safe and efficient traffic flow.	Y	Incorporated as a project-specific BMP in the Traffic Management Plan (see Appendix B).
During construction and operation, traffic should be restricted to the roads developed for the project. Use of other unimproved roads should be restricted to emergency situations.	Y	Incorporated as a project-specific BMP in the Traffic Management Plan (see Appendix B).
5.7 Hazardous Materials and Waste Management Impacts (BLM 2005:5-31 to 5-32)		
The BLM should be provided with a comprehensive listing of the hazardous materials that would be used, stored, transported, or disposed of during activities associated with site monitoring and testing, construction, operation, and decommissioning of a wind energy project.	Y	Incorporated as a project-specific BMP in the SWPPP and SPP (see Appendix D).
Operators should develop a hazardous materials management plan addressing storage, use, transportation, and disposal of each hazardous material anticipated to be used at the site. The plan should identify all hazardous materials that would be used, stored, or transported at the site. It should establish inspection procedures, storage requirements, storage quantity limits, inventory control, nonhazardous product substitutes, and disposition of excess materials. The plan should also identify requirements for notices to federal and local emergency response authorities and include emergency response plans.	Y	Incorporated as a project-specific BMP in the SWPPP and SPP (see Appendix D) and would be completed as part of the COM Plan.
Operators should develop a Waste Management Plan identifying the waste streams that are expected to be generated at the site and addressing hazardous waste determination procedures, waste storage locations, waste-specific management and disposal requirements, inspection procedures, and waste minimization procedures. This plan should address all solid and liquid waste that may be generated at the site.	Y	Incorporated as a project-specific BMP in the SWPPP and SPP (see Appendix D) and would be completed as part of the COM Plan.
Operators should develop a spill prevention and response plan identifying where hazardous materials and wastes are stored on site, spill prevention measures to be implemented, training requirements, appropriate spill response actions for each material or waste, the locations of spill response kits on-site, a procedure for ensuring that the spill response kits are adequately stocked at all times, and procedures for making timely notifications to authorities.	Y	Incorporated as a project-specific BMP in the SWPPP and SPP (see Appendix D).
Operators should develop a SWPPP for the site to ensure compliance with applicable regulations and prevent off-site migration of contaminated stormwater or increased soil erosion.	Y	Incorporated as a project-specific BMP in the SWPPP and SPP (see Appendix D) and would be completed as part of the COM Plan.
If pesticides are to be used on-site, an integrated pest management plan should be developed to ensure that applications will be conducted within the framework of BLM and Department of the Interior policies and entail the use of only EPA-registered pesticides. Pesticide use should be limited to non-persistent, immobile pesticides and should only be applied in accordance with label and application permit directions and stipulations for terrestrial and aquatic applications.	N	Pesticides are not anticipated to be used during construction or operation of the SVWEF. If pesticides must be used, SVW would coordinate with the BLM.
Secondary containment should be provided for all on-site hazardous materials and waste storage, including fuel. In particular, fuel storage (for construction vehicles and equipment) should be a temporary activity occurring only for as long as is needed to support construction and decommissioning activities. Fuel storage facilities should be removed from the site after these activities are completed.	Y	Built into the Proposed Action and Alternate Development Alternative.
Wastes should be properly containerized and removed periodically for disposal at appropriate off-site permitted disposal facilities.	Y	Built into the Proposed Action and Alternate Development Alternative.
In the event of an accidental release to the environment, the operator should document the event, including a root cause analysis, appropriate corrective actions taken, and a characterization of the resulting environmental or health and safety impacts. Documentation of the event should be provided to the BLM authorized officer and other federal and state agencies, as required.	Y	Incorporated as a project-specific BMP in the SWPPP and SPP (see Appendix D) and would be completed as part of the COM Plan.
Any wastewater generated in association with temporary, portable sanitary facilities should be periodically removed by a licensed hauler and introduced into an existing municipal sewage treatment facility. Temporary, portable sanitary facilities provided for construction crews should be adequate to support expected on-site personnel and should be removed at the completion of construction activities.	Y	Built into the Proposed Action and Alternate Development Alternative.

Table 6.1-1. PEIS Mitigation Rationale (Continued)

Mitigation	Is Mitigation Incorporated Into EA? (Y/N)	Rationale
5.8 Health and Safety Impacts – Occupational (BLM 2005:5-32 to 5-33)		
All construction, operation, and decommissioning activities should be conducted in compliance with applicable federal and state occupational safety and health standards (e.g., OSHA's Occupational Health and Safety Standards, 29 CFR Parts 1910 and 1926, respectively.	Y	Built into the Proposed Action and Alternate Development Alternative.
A safety assessment should be conducted to describe potential safety issues and the means that would be taken to mitigate them, including issues such as site access, construction, safe work practices, security, heavy equipment transportation, traffic management, emergency procedures, and fire control.	Y	Incorporated herein as a project-specific BMP and would be completed prior to construction by the on-site contractor.
A health and safety program should be developed to protect workers during construction, operation, and decommissioning of a wind energy project. The program should identify all applicable federal and state occupational safety standards, establish safe work practices for each task (e.g., requirements for personal protective equipment and safety harnesses; OSHA standard practices for safe use of explosives and blasting agents; and measures for reducing occupational electromagnetic frequency exposures), establish fire safety evacuation procedures, and define safety performance standards (e.g., electrical system standards and lighting protection standards). The program should include a training program to identify hazard training requirements for workers for each task and establish procedures for providing required training to all workers. Documentation of training and a mechanism for reporting serious accidents to appropriate agencies should be established.	Y	Incorporated herein as a project-specific BMP and would be completed as part of the COM Plan.
Electrical systems should be designed to meet all applicable safety standards (e.g., National Electrical Code and International Electrical Code).	Y	Built into the Proposed Action and Alternate Development Alternative.
For the mitigation of explosive hazards, workers should be required to comply with the OSHA standard (1910.109) for the safe use of explosives and blasting agents.	N	No blasting would occur. Not applicable.
Measures should be considered to reduce occupational electromagnetic frequencies exposures, such as backing the generator with iron to block electromagnetic frequencies, shutting down the generator when working in the vicinity, and/or limiting exposure time while the generator is running.	Y	Incorporated herein as a project-specific BMP and would be completed as part of the COM Plan.
5.8 Health and Safety Impacts – Public Safety (BLM 2005:5-33 to 5-34)		
The project health and safety program should also address protection of public health and safety during construction, operation, and decommissioning of a wind energy project. The program should establish a safety zone or setback for wind turbine generators from residences and occupied buildings, roads, ROWs, and other public access areas that is sufficient to prevent accidents resulting from various hazards during the operation of WTGs. It should identify requirements for temporary fencing around staging areas, storage yards, and excavations during construction or decommissioning activities. It should also identify measures to be taken during the operations phase to limit public access to facilities (e.g., permanent fencing should be installed around electrical substations, and turbine tower access doors should be locked to limit public access).	Y	WTG setbacks and fencing needs have been built into the Proposed Action and Alternate Development Alternative. Other health and safety program measures are incorporated herein as a project-specific BMP and would be completed as part of the COM Plan.
Operators should consult with local planning authorities regarding increased traffic during the construction phase, including an assessment of the number of vehicles per day, their size, and type. Specific issues of concern (e.g., location of school bus routes and stops) should be identified and addressed in the Traffic Management Plan.	Y	Incorporated as a project-specific BMP in the Traffic Management Plan (see Appendix B).
If operation of the wind turbines is expected to cause significant adverse impacts to nearby residences and occupied buildings from shadow flicker, low-frequency sound, or electromagnetic frequencies, site-specific recommendations for addressing these concerns should be incorporated into the project design (e.g., establishing a sufficient setback from turbines).	N	Not applicable.
The project should be planned to minimize EMI (e.g., impacts to radar, microwave, television, and radio transmissions) and comply with Federal Communications Commission regulations. Signal strength studies should be conducted when proposed locations have the potential to impact transmissions. Potential interference with public safety communication systems (e.g., radio traffic related to emergency activities) should be avoided.	Y	Built into the Proposed Action and Alternate Development Alternative.
In the event an installed wind energy development project results in EMI, the operator should work with the owner of the impacted communications system to resolve the problem. Potential mitigation may include realigning the existing antenna or installing relays to transmit the signal around the wind energy project. Additional warning information may also need to be conveyed to aircraft with onboard radar systems so that echoes from wind turbines can be quickly recognized.	Y	Built into the Proposed Action and Alternate Development Alternative.
The project should be planned to comply with FAA regulations, including lighting requirements, and to avoid potential safety issues associated with proximity to airports, military bases or training areas, or landing strips.	Y	Incorporated herein and the Lighting Plan (see Appendix C). FAA and Department of Defense have provided letters approving the project.
Operators should develop a fire management strategy to implement measures to minimize the potential for a human-caused fire.	Y	Basic fire management strategies are discussed in the POD. Strategies are Incorporated herein as a project-specific BMP and would be completed as part of the COM Plan.
5.9 Ecological Resources – Birds (BLM 2005:5-65 to 5-66)		
Raptor use of the project area should be evaluated, and the project should be designed to minimize or mitigate the potential for raptor strikes. Scientifically rigorous raptor surveys should be conducted; the amount and extent of baseline data required should be determined on a project-specific basis.	Y	Surveys and data analysis are described in SWCA (2009a). Project design to minimize or mitigate raptor strikes is incorporated into the Alternate Development Alternative and is included in the ABPP (see Appendix F).
Areas with a high incidence of fog, mist, low cloud ceilings, and low visibility should be avoided.	N	Not applicable.
Turbine locations should be configured in order to avoid landscape features (including prairie dog colonies and other high-prey potential sites) known to attract raptors.	Y	Built into the Proposed Action and Alternate Development Alternative.
Turbine arrays should be configured to minimize avian mortality (e.g., orient rows of turbines parallel to known bird movements).	N	Orienting rows parallel to bird movements would result in a project that is no longer viable because turbines would miss the major wind flow.
Underground or raptor-safe transmission lines should be used to reduce collision and electrocution potential.	Y	Built into the Proposed Action and Alternate Development Alternative.
A habitat restoration plan should be developed that avoids or minimizes negative impacts to vulnerable wildlife while maintaining or enhancing habitat values for other species (e.g., avoid the establishment of habitat that attracts high densities of prey animals used by raptors).	Y	Incorporated into the Restoration and Weed Management Plan (see Appendix A).
Road cuts, which are favored by pocket gophers and ground squirrels, should be minimized.	Y	Built into the Proposed Action and Alternate Development Alternative.

Table 6.1-1. PEIS Mitigation Rationale (Continued)

Mitigation	Is Mitigation Incorporated Into EA? (Y/N)	Rationale
5.9 Ecological Resources – Birds (BLM 2005:5-65 to 5-66), continued		
Either no vegetation or native plant species that do not attract small mammals should be maintained around the turbines.	Y	Incorporated herein. Each turbine pad would have a 75-foot-diameter gravel area maintained at the base of the turbine. All other disturbed areas would be restored as described in the Restoration and Weed Management Plan (see Appendix A).
Tubular supports rather than lattice supports should be used, with no external ladders and platforms.	Y	Built into the Proposed Action and Alternate Development Alternative.
The minimum amount of pilot warning and obstruction avoidance lighting specified by the FAA should be used, and the FAA should be consulted.	Y	Built into the Proposed Action and Alternate Development Alternative. FAA has been consulted and has provided a letter approving the project. Incorporated herein as a project-specific BMP in the Lighting Plan (see Appendix C).
Operators should determine whether active raptor nests (i.e., raptor nests used during the breeding season) are present. Buffers should be provided to avoid disturbance of nesting raptors.	Y	Incorporated into the Alternate Development Alternative.
Areas with high bird use should be avoided by micrositing alternatives (e.g., at the Foote Creek Rim project, turbines were located slightly away from the rim edge of a flat top mesa).	Y	Incorporated into the Alternate Development Alternative; Turbines and infrastructure located outside occupied and high-quality pygmy rabbit habitat and 2 miles away from active leks. Turbines located ½ mile outside of water sources and known raptor nests.
5.9 Ecological Resources – Bats (BLM 2005:5-71)		
Turbines should not be located near known bat hibernation, breeding, and maternity/nursery colonies, in migration corridors, or in flight paths between colonies and feeding areas.	N	The project is approximately 4 miles from Rose Guano Bat Cave. In place of this measure, a project-specific Mitigation Measure has been provided in Section 6.4.2 and in the ABPP (see Appendix F). Specifically, if project location leads to mortality exceeding thresholds during migration, cut-in speed increases and WTG shutdowns can be implemented throughout the entire migration period. Implementation of those measures would effectively remove the project from operation during migration and substantially reduce operational risks addressing the intent of this measure.
Bat use of the project area should be evaluated, and the project should be designed to minimize or mitigate the potential for bat strikes. Both macro- and micrositing options can be considered to minimize impacts to bats.	Y	Incorporated in the ABPP (see Appendix F).
5.9 Ecological Resources – Gallinaceous Birds (BLM 2005:5-73 to 5-74)		
Identify and avoid both local (daily) and seasonal migration routes.	Y	Incorporated into the Proposed Action and Alternate Development Alternative.
Consider sage-grouse and sage habitat when designing, constructing, and using project access roads and trails.	Y	Incorporated into the Alternate Development Alternative. Includes a protective buffer of 2 miles from leks and minimizes the disturbance footprint.
Avoid, when possible, siting energy developments in breeding habitats.	N	Potential breeding habitat occurs in the project area at low frequencies; however, the project is 2 miles from the closest lek and individuals likely use habitat west of SR 893 and the nearby overhead transmission line, thereby avoiding physical barriers.
Adjust the timing of activities to minimize disturbance to sage-grouse during critical periods.	Y	Incorporated herein and covered in Section 2.1.4.3, Resource Conservation Measures.
When possible, locate energy-related facilities away from active leks or near sage-grouse habitat.	Y	Incorporated into the Alternate Development Alternative; no turbines within 2 miles of an active lek.
When possible, restrict noise levels to 10 dB above background noise levels at the lek sites.	Y	Incorporated into the Proposed Action and Alternate Development Alternative.
Minimize nearby human activities when birds are near or on leks.	Y	Incorporated herein and covered in Section 2.1.4.3, Resource Conservation Measures.
As practicable, do not conduct surface-use activities within crucial sage-grouse wintering areas from December 1 through March 15.	Y	Incorporated herein; current schedule has most surface disturbance occurring outside this time frame.
Maintain sagebrush communities on a landscape scale.	Y	Incorporated into the Proposed Action and Alternate Development Alternative.
Provide compensatory habitat restoration for impacted sagebrush habitat.	Y	As part of the Proposed Action (see Section 2.1.5) and Alternative Development Alternative (see Section 2.2.5), the proponent would donate funds for sagebrush, and consequently sage-grouse, habitat restoration and enhancement activities which meets the intent of this measure.
Avoid the use of pesticides at grouse breeding habitat during the brood-rearing season.	Y	Incorporated herein and covered in Section 2.1.4.3, Resource Conservation Measures.
Develop and implement appropriate measures to prevent the introduction or dispersal of noxious weeds.	Y	Incorporated into the Restoration and Weed Management Plan (see Appendix A).
Avoid creating attractions for raptors and mammalian predators in sage-grouse habitat.	Y	Incorporated herein and the ABPP (see Appendix F).
Consider measures to mitigate impacts at off-site locations to offset unavoidable sage-grouse habitat alteration and reduction at the project site.	Y	As part of the Proposed Action (see Section 2.1.5) and Alternative Development Alternative (see Section 2.2.5), the proponent would donate funds for sagebrush, and consequently sage-grouse, habitat restoration and enhancement activities which meets the intent of this measure.

Table 6.1-1. PEIS Mitigation Rationale (Continued)

Mitigation	Is Mitigation Incorporated Into EA? (Y/N)	Rationale
5.9 Ecological Resources – Standard Management Procedures Relevant to Gallinaceous Birds (BLM 2005:5-74)		
Development of monitoring programs and adaptive management strategies.	Y	Incorporated into the ABPP (see Appendix F).
Control of invasive species,	Y	Incorporated into the Restoration and Weed Management Plan (see Appendix A).
Prohibition or restriction of OHV activity.	Y	Incorporated herein.
Consideration of sage-grouse habitat needs when developing restoration plans.	Y	Incorporated into the Restoration and Weed Management Plan (see Appendix A).
Avoidance of placing facilities in or next to sensitive habitats such as leks and wintering habitat.	Y	Incorporated into the Alternate Development Alternative; no turbines within 2 miles of an active lek.
Location or construction of facilities so that facility noise does not disturb grouse activities or leks.	Y	Incorporated into the Proposed Action and Alternate Development Alternative.
Consolidation of facilities as much as possible (use existing ROWs).	Y	Incorporated into the Proposed Action and Alternate Development Alternative.
Initiation of restoration practices as quickly as possible following land disturbance.	Y	Incorporated into the Restoration and Weed Management Plan (see Appendix A).
Installation of anti-perching devices on existing or new power lines in occupied sage-grouse habitat.	Y	Incorporated into the ABPP (see Appendix F). However, this measure is based on approval from the power line owner(s)/operator(s).
Design of wind energy facilities to reduce habitat fragmentations and mortality to sage-grouse.	Y	Incorporated into the Proposed Action and Alternate Development Alternative. Occurs in an area within fragmentation and uses existing roads and disturbances to limit additional fragmentation.
Construction Mitigations		
5.9.5.1 Mitigation during Site Monitoring and Testing (BLM 2005:5-78)		
Existing roads should be used to the maximum extent feasible to access a proposed project area.	Y	Whenever possible, existing roads, such as the main north-south access road, would be used and improved to avoid additional disturbance. Additionally, access to Gravel Pit B outside the project area would be along an existing road.
If new access roads are necessary, they should be designed and constructed to the appropriate standard.	Y	Standards for new road construction are incorporated into the Traffic Management Plan (see Appendix B).
Existing or new roads should be maintained to the condition needed for facility use.	Y	Standard road maintenance is incorporated into the Traffic Management Plan (see Appendix B) and would be implemented under the COM plan.
The area disturbed during the installation of MET towers (i.e., the tower footprint and its associated laydown area) should be kept to a minimum.	Y	Incorporated into the Proposed Action and Alternate Development Alternative.
Individual MET towers should not be located in or near sensitive habitats or in areas where ecological resources known to be sensitive to human activities are present.	Y	Incorporated into the Proposed Action and Alternate Development Alternative.
Installation of MET towers should be scheduled to avoid disruption of wildlife reproductive activities or other important behaviors (e.g., during periods of sage-grouse nesting).	Y	Incorporated herein and covered in Section 2.1.4.3, Resource Conservation Measures.
5.9.5.2 Mitigation during Plan of Development Preparation and Project Design (BLM 2005:5-78 to 5-79)		
Operators should identify important, sensitive, or unique habitat and biota in the project vicinity and site and design the project to avoid (if possible), minimize, or mitigate potential impacts to these resources. The design and siting of the facility should follow appropriate guidance and requirements from the BLM and other resource agencies, as available and applicable.	Y	Incorporated into the Proposed Action and Alternate Development Alternative. Biological, cultural, and visual studies were completed and the project was redesigned based on their findings, including creating an Alternate Development Alternative.
The BLM and operators should contact appropriate agencies early in the planning process to identify potentially sensitive ecological resources that may be present in the area of the wind energy development.	Y	Scoping meetings were held in 2008, and additional meetings were held in the first quarter of 2010.
The operators should conduct surveys for federally or state-protected species and other species of concern within the project area.	Y	Surveys conducted for species determined appropriate by BLM biologists.
Operators should evaluate avian and bat use (including the locations of active nest sites, colonies, roosts, and migration corridors) of the project area by using scientifically rigorous survey methods.	Y	A two-year study was completed (SWCA 2009a).
The project should be planned to avoid (if possible), minimize, or mitigate impacts to wildlife and habitat.	Y	An ABPP has been prepared (see Appendix F).
Discussion should be held with the appropriate BLM Field Office staff regarding the occurrence of sensitive species or other valued ecological resources in the proposed project area.	Y	Completed throughout process.
Existing information on species and habitats in the project area should be reviewed.	Y	Completed in Biology Report (SWCA 2009b).
5.9.5.2.1 Mitigating Habitat Impacts (BLM 2005:5-79 to 5-80)		
If survey results indicate the presence of important, sensitive, or unique habitats (such as wetlands and sagebrush habitat) in the project vicinity, facility design should locate turbines, roads, and support facilities in areas least likely to impact those habitats.	Y	Incorporated into the Alternate Development Alternative.
Habitat disturbance should be minimized by locating facilities (such as utility corridors and access roads) in previously disturbed areas (i.e., locate transmission lines within or adjacent to existing power line corridors).	Y	Incorporated into the Proposed Action and Alternate Development Alternative.

Table 6.1-1. PEIS Mitigation Rationale (Continued)

Mitigation	Is Mitigation Incorporated Into EA? (Y/N)	Rationale
5.9.5.2.1 Mitigating Habitat Impacts (BLM 2005:5-79 to 5-80), continued		
Existing roads and utility corridors should be used to the maximum extent feasible.	Y	Whenever possible, existing roads, such as the main north-south access road, would be used and improved to avoid additional disturbance. Additionally, access to Gravel Pit B outside the project area would be along an existing road.
New access roads and utility corridors should be configured to avoid high-quality habitat and minimize habitat fragmentation.	Y	Incorporated into the Alternate Development Alternative.
Site access roads and utility corridors should minimize stream crossings.	Y	Incorporated into the Proposed Action and Alternate Development Alternative.
A habitat restoration management plan should be developed that identifies vegetation, soil stabilization, and erosion reduction measures and requires that restoration activities be implemented as soon as possible following facility construction activities.	Y	Incorporated into the Restoration and Weed Management Plan (see Appendix A).
Individual project facilities should be located to maintain existing stands of quality habitat and continuity between stands.	Y	Incorporated into the Proposed Action and Alternate Development Alternative.
The creation of, or increase in, the amount of edge habitat between natural habitats and disturbed lands should be minimized.	Y	Incorporated into the Proposed Action and Alternate Development Alternative; roads and collection system in same corridor to reduce number of corridors, using existing roads as much as possible, using an existing disturbed gravel source (Gravel Pit B).
To minimize impacts to aquatic habitats from increased erosion, the use of fill ramps rather than stream bank cutting should be designated for all stream crossings by access roads.	N	Not applicable.
Stream crossings should be designed to provide in-stream conditions that allow for and maintain uninterrupted movement and safe passage of fish.	N	Not applicable.
5.9.5.2.2 Mitigating Site/Wildlife Interactions (BLM 2005:5-80 to 5-81).		
Locations that are heavily used by migratory birds and bats should be avoided.	Y	The use for birds relative to other sites along ridgelines is lower; the use for bats is estimated to be lower than foraging areas south of the area where there are more water sources and better overall habitat. However, an ABPP (see Appendix F) has been prepared to address potential impacts from site use.
Permanent MET towers, transmission towers, and other facility structures should be designed to discourage their use by birds for perching or nesting.	Y	Incorporated into the Proposed Action and Alternate Development Alternative.
The use of guy wires on permanent MET towers should be avoided or minimized.	Y	Incorporated into the Proposed Action and Alternate Development Alternative.
Electrical supply lines should be buried in a manner that minimizes additional surface disturbance. Overhead lines should be used in cases where the burial of lines would result in further habitat disturbance.	Y	Incorporated into the Proposed Action and Alternate Development Alternative.
Power lines should be configured to minimize the potential for electrocution of birds, by following established guidelines.	Y	Incorporated into the Proposed Action and Alternate Development Alternative.
Operators should consider incorporating measures to reduce raptor use of the project site into the design of the facility layout (e.g., minimize road cuts and maintain non-attractive vegetation around turbines).	Y	Incorporated into the ABPP (see Appendix F).
Turbines and other project facilities should not be located in areas with known high bird usage; in known bird and/or bat migration corridors or known flight paths; near raptor nest sites; and in areas used by bats as colonial hibernation, breeding, and maternity/nursery colonies, if site studies show that they would pose a high risk to species of concern.	N	Project is in an area with several raptor nest sites nearby and a major bat hibernacula. The Alternate Development Alternative locates facilities away from raptor sites. An ABPP (see Appendix F) has been prepared to address the potential impacts associated with both birds and bats. Specifically, if project location leads to mortality exceeding thresholds during migration, cut-in speed increases and WTG shutdowns can be implemented throughout the entire migration period. Implementation of those measures would effectively remove the project from operation during migration and substantially reduce operational risks addressing the intent of this measure.
Wind energy projects should not be located in areas with a high incidence of fog and mist.	N	Not applicable.
To reduce attraction of migratory birds to turbines and towers, the need for or use of sodium vapor lights at site facilities should be minimized or avoided.	Y	Incorporated into the Lighting Plan (see Appendix C).
Turbines should be configured to avoid landscape features known to attract raptors, if site studies show that placing turbines there would pose a significant risk to raptors.	Y	The Alternate Development Alternative is configured to avoid attractant landscape features.
Mitigations During Construction		
5.9.5.3.1 Mitigating Habitat Disturbance (BLM 2005:5-81).		
The size of all disturbed areas should be minimized.	Y	Whenever possible, existing roads, such as the main north-south access road, would be used and improved to avoid additional disturbance. Additionally, access to Gravel Pit B outside the project area would be along an existing road.
Where applicable, the extent of habitat disturbance should be reduced by keeping vehicles on access roads and minimizing foot and vehicle traffic through undisturbed areas.	Y	Incorporated into the Proposed Action and Alternate Development Alternative; would be implemented under the COM plan.
Habitat restoration activities should be initiated as soon as possible after construction activities are completed.	Y	Incorporated in the Restoration and Weed Management Plan (see Appendix A).

Table 6.1-1. PEIS Mitigation Rationale (Continued)

Mitigation	Is Mitigation Incorporated Into EA? (Y/N)	Rationale
5.9.5.3.2 Mitigating Disturbance and Injury of Vegetation and Wildlife (BLM 2005:5-81 to 5-82)		
In consultation with staff from the BLM and other appropriate natural resource agencies, construction activities should be scheduled to avoid important periods of wildlife courtship, breeding, nesting, lambing, or calving.	Y	Incorporated herein and covered in Section 2.1.4.3, Resource Conservation Measures.
All construction employees should be instructed to avoid harassment and disturbance of wildlife, especially during reproductive (e.g., courtship, nesting) seasons. In addition, pets will not be permitted on-site during construction.	Y	Incorporated herein and described in Section 6.4.1.
Buffer zones should be established around raptor nests, bat roosts, and biota and habitats of concern, if site studies show that proposed facilities would pose a significant risk to avian or bat species of concern.	Y	Incorporated into the Alternate Development Alternative.
Noise-reduction devices (e.g., mufflers) should be maintained in good working order on vehicles and construction equipment.	Y	Incorporated herein as a project-specific BMP.
Explosives should be used only within specified times and at specified distances from sensitive wildlife or surface waters as established by the BLM or other federal and state agencies.	N	Not applicable.
The use of guy wires on permanent MET towers should be avoided.	Y	Incorporated into the Proposed Action and Alternate Development Alternative.
5.9.5.3.3 Mitigating Erosion and Fugitive Dust Generation (BLM 2005:5-82).		
Erosion controls that comply with county, state, and federal standards should be applied. Practices such as jute netting, silt fences, and check dams should be applied near disturbed areas.	Y	Incorporated as project-specific BMPs in the SWPPP and SPP (see Appendix D).
All areas of disturbed soil should be reclaimed using weed-free native grasses, forbs, and shrubs. Reclamation activities should be undertaken as early as possible on disturbed areas.	Y	Incorporated as project-specific BMPs in the Restoration and Weed Management Plan (see Appendix A).
Dust abatement techniques should be used on unpaved, unvegetated surfaces to minimize airborne dust.	Y	Incorporated herein as a project-specific BMP.
Construction materials and stockpiled soil should be covered if they are a source of fugitive dust.	Y	Incorporated herein as a project-specific BMP.
Erosion and fugitive dust control measures should be inspected and maintained regularly.	Y	Incorporated herein as a project-specific BMP.
5.9.5.3.4 Mitigating Fuel Spills (BLM 2005:5-82 to 5-83).		
All refueling should occur in a designated fueling area that includes a temporary berm to limit the spread of any spill.	Y	Incorporated as a project-specific BMP in the SWPPP and SPP (see Appendix D).
Drip pans should be used during refueling to contain accidental releases.	Y	Incorporated as a project-specific BMP in the SWPPP and SPP (see Appendix D).
Drip pans should be used under fuel pump and valve mechanisms of any bulk fueling vehicles parked at the construction site.	Y	Incorporated as a project-specific BMP in the SWPPP and SPP (see Appendix D).
Spills should be immediately addressed per the appropriate spill management plan, and soil cleanup and soil removal initiated if needed.	Y	Incorporated as a project-specific BMP in the SWPPP and SPP (see Appendix D).
5.9.5.3.5 Mitigating Establishment of Invasive Vegetation (BLM 2005:5-83).		
Operators should develop a plan for control of noxious weeds and invasive plants, which could occur as a result of new surface disturbance activities at the site. The plan should address monitoring, weed identification, the manner in which weeds spread, and methods for treating infestations. The use of certified weed-free mulching should be required.	Y	Incorporated as a project-specific BMP in the Restoration and Weed Management Plan (see Appendix A).
If trucks and construction equipment are arriving from locations with known invasive vegetation problems, a controlled inspection and cleaning area should be established to visually inspect construction equipment arriving at the project area and to remove and collect seeds that may be adhering to tires and other equipment surfaces.	Y	Incorporated as a project-specific BMP in the Restoration and Weed Management Plan (see Appendix A).
Access roads and newly established utility and transmission line corridors should be monitored regularly for invasive species establishment, and weed control measures should be initiated immediately upon evidence of invasive species introduction.	Y	Incorporated as a project-specific BMP in the Restoration and Weed Management Plan (see Appendix A).
Fill materials that originate from areas with known invasive vegetation problems should not be used.	Y	Incorporated as a project-specific BMP in the Restoration and Weed Management Plan (see Appendix A).
Certified weed-free mulch should be used when stabilizing areas of disturbed soil.	Y	Incorporated as a project-specific BMP in the Restoration and Weed Management Plan (see Appendix A).
Habitat restoration activities and invasive vegetation monitoring and control activities should be initiated as soon as possible after construction activities are completed.	Y	Incorporated as a project-specific BMP in the Restoration and Weed Management Plan (see Appendix A).
All areas of disturbed soil should be reclaimed using weed-free native shrubs, grasses, and forbs.	Y	Incorporated as a project-specific BMP in the Restoration and Weed Management Plan (see Appendix A).
Pesticide use should be limited to non-persistent, immobile pesticides and should only be applied in accordance with label and application permit directions and stipulations for terrestrial and aquatic applications.	Y	Incorporated as a project-specific BMP in the Restoration and Weed Management Plan (see Appendix A).
Mitigation During Operation		
5.9.5.4.1 Mitigating Fuel Spills and Exposure to Site-Related Chemicals (BLM 2005:5-84).		
Drip pans should be used during refueling to contain accidental releases.	Y	Incorporated as a project-specific BMP in the SWPPP and SPP (see Appendix D).
Pesticide use should be limited to non-persistent, immobile pesticides and herbicides and should only be applied in accordance with label and application permit directions and stipulations for terrestrial and aquatic applications.	Y	Incorporated as a project-specific BMP in the Restoration and Weed Management Plan (see Appendix A).
Spills should be immediately addressed per the appropriate spill management plan, and soil cleanup and removal initiated, if needed.	Y	Incorporated as a project-specific BMP in the SWPPP and SPP (see Appendix D).

Table 6.1-1. PEIS Mitigation Rationale (Continued)

Mitigation	Is Mitigation Incorporated Into EA? (Y/N)	Rationale
5.9.5.4.2 Mitigating Establishment of Invasive Vegetation (BLM 2005:5-84).		
Access roads, utility and transmission line corridors, and tower site areas should be monitored regularly for invasive species establishment, and weed control measures should be initiated immediately upon evidence of invasive species introduction.	Y	Incorporated as a project-specific BMP in the Restoration and Weed Management Plan (see Appendix A).
5.9.5.4.3 Mitigating Site/Wildlife Interactions (BLM 2005:5-84 to 5-85).		
Higher-height vegetation (i.e., shrub species) should be encouraged along transmission corridors to minimize foraging in these areas by raptors to the extent local conditions will support this vegetation.	N	A new transmission corridor is not part of the proposed project.
Areas around turbines, MET towers, and other facility structures should be maintained in an unvegetated state (e.g., crushed gravel), or only vegetation that does not support wildlife use should be planted.	Y	Incorporated in the Restoration and Weed Management Plan (see Appendix A) and the ABPP (see Appendix F).
All unnecessary lighting should be turned off at night to limit attracting migratory birds.	Y	Incorporated as a project-specific BMP in the Lighting Plan (see Appendix C).
Employees, contractors, and site visitors should be instructed to avoid harassment and disturbance of wildlife, especially during reproductive (e.g., courtship and nesting) seasons. In addition, pets should be controlled to avoid harassment and disturbance of wildlife.	Y	Incorporated herein and described in Section 6.4.1.
Observations of potential wildlife problems, including wildlife mortality, should be reported to the BLM authorized officer immediately.	Y	Incorporated and described in the ABPP (see Appendix F).
5.9.5.5 Mitigation during Decommissioning (BLM 2005:5-85).		
All turbines and ancillary structures should be removed from the site.	Y	Incorporated into the Proposed Action and Alternate Development Alternative.
Topsoil from all decommissioning activities should be salvaged and reapplied during final reclamation.	Y	Incorporated as a project-specific BMP in the Restoration and Weed Management Plan (see Appendix A).
All areas of disturbed soil should be reclaimed using weed-free native shrubs, grasses, and forbs.	Y	Incorporated as a project-specific BMP in the Restoration and Weed Management Plan (see Appendix A).
The vegetation cover, composition, and diversity should be restored to values commensurate with the ecological setting.	Y	Incorporated in the Restoration and Weed Management Plan (see Appendix A).
5.9.5.6 Mitigation for Threatened, Endangered, and Sensitive Species (BLM 2005:5-85)		
Field surveys should be conducted to verify the absence or presence of the species in the project area and especially within individual project footprints.	Y	Appropriate preconstruction surveys have been completed.
Project facilities or laydown areas should not be placed in areas documented to contain or provide important habitat for those species.	Y	Incorporated into the Alternate Development Alternative.
5.10 Land Use (BLM 2005:5-89 to 5-90)		
Wind energy projects should be planned to mitigate or minimize impacts to other land uses.	Y	Incorporated into the Proposed Action and Alternate Development Alternative.
Federal and state agencies, property owners, and other stakeholders should be contacted as early as possible in the planning process to identify potentially sensitive land uses and issues, rules that govern wind energy development locally, and land use concepts specific to the region.	Y	Incorporated into the Proposed Action and Alternate Development Alternative.
The Department of Defense should be consulted regarding the potential impact of a proposed wind energy project on military operations in order to identify and address any Department of Defense concerns.	Y	Incorporated into the Proposed Action and Alternate Development Alternative. FAA and the Department of Defense have provided a letter approving the project.
The FAA-required notice of proposed construction should be made as early as possible to identify any air safety measures that would be required.	Y	Incorporated into the Proposed Action and Alternate Development Alternative. FAA and the Department of Defense have provided a letter approving the project.
When feasible, a wind energy project should be sited on already altered landscapes.	N	Not feasible; elements of the facility have been sited on altered landscapes, including existing roads when possible and one gravel pit (Gravel Pit B).
To plan for efficient land use, necessary infrastructure requirements should be consolidated whenever possible, and current transmission and market access should be evaluated.	Y	Incorporated into the Proposed Action and Alternate Development Alternative.
Restoration plans should be developed to ensure that all temporary use areas are restored.	Y	Incorporated into the Proposed Action and Alternate Development Alternative and the Restoration and Weed Management Plan (see Appendix A).
5.11 Visual Resources (BLM 2005:5-96 to 5-99)		
Existing mitigation measures developed by the BLM regarding VRM should be followed.	Y	Ely RMP/FEIS VRM measures are incorporated herein.
The public should be involved and informed about the visual site design elements of the proposed wind energy projects. Possible approaches include conducting public forums for disseminating information regarding wind energy development, such as design, operations, and productivity; offering organized tours of operating wind energy development projects; using computer simulation and visualization techniques in public presentations; and conducting surveys regarding public perceptions and attitudes about wind energy development.	Y	Incorporated into the Proposed Action and Alternate Development Alternative; Photographic and computer simulations were provided at the stakeholder meetings; photographic simulations were provided at public meetings, the visual assessment report was posted to the BLM website for public review, and the public was encouraged to view the nearby Milford Wind Project as an example.
Turbine arrays and the turbine design should be integrated with the surrounding landscape. To accomplish this integration, several elements of design need to be incorporated.	Y	Incorporated into the Proposed Action and Alternate Development Alternative; Nearby KOPs were considered when finalizing the project area. Turbines would not be visible from Cleve Creek or the residences at Sacramento Pass. Turbines are not set against the skyline, helping to integrate them with the surrounding landscape.
The operator should provide visual order and unity among clusters of turbines (visual units) to avoid visual disruptions and perceived disorder, disarray, or clutter.	Y	Incorporated into the Proposed Action and Alternate Development Alternative; turbines are in visual order.

Table 6.1-1. PEIS Mitigation Rationale (Continued)

Mitigation	Is Mitigation Incorporated Into EA? (Y/N)	Rationale
5.11 Visual Resources (BLM 2005:5-96 to 5-99), continued		
To the extent possible given the terrain of a site, the operator should create clusters or groupings of wind turbines when placed in large numbers; avoid a cluttering effect by separating otherwise overly long lines of turbines, or large arrays; and insert breaks or open zones to create distinct visual units or groups of turbines	Y	Incorporated into the Proposed Action and Alternate Development Alternative; visual simulations show that the spacing between turbines does not lead to a "cluttering" effect.
The operator should create visual uniformity in the shape, color, and size of rotor blades, nacelles, and towers.	Y	Incorporated into the Proposed Action and Alternate Development Alternative.
The use of tubular towers is recommended. Truss or lattice-style wind turbine towers with lacework, pyramidal, or prism shapes should be avoided. Tubular towers present a simpler profile and less complex surface characteristics and reflective/shading properties.	Y	Incorporated into the Proposed Action and Alternate Development Alternative.
Components should be in proper proportion to one another. Nacelles and towers should be planned to form an aesthetic unit and should be combined with particular sizes and shapes in mind to achieve an aesthetic balance between the rotor, nacelle, and tower.	Y	Incorporated into the Proposed Action and Alternate Development Alternative
Color selections for turbines should be made to reduce visual impact and should be applied uniformly to tower, nacelle, and rotor, unless gradient or other patterned color schemes are used.	Y	Incorporated into the Proposed Action and Alternate Development Alternative; the color used does the best job of blending into the surroundings. Other colors would have FAA-required lighting, which would increase visual impacts.
The operator should use non-reflective paints and coatings to reduce reflection and glare. Turbines, visible ancillary structures, and other equipment should be painted before or immediately after installation. Uncoated galvanized metallic surfaces should be avoided because they would create a stronger visual contrast, particularly as they oxidize and darken.	Y	Incorporated herein as a project-specific BMP.
Commercial messages on turbines and towers should be prohibited.	Y	Incorporated into the Proposed Action and Alternate Development Alternative.
The site design should be integrated with the surrounding landscape.	Y	Incorporated into the Proposed Action and Alternate Development Alternative.
To the extent practicable, the operator should avoid placing substations or large operations buildings on high land features and along "skylines" that are visible from nearby sensitive view points. The presence of these structures should be concealed or made less conspicuous. Conspicuous structures should be designed and constructed to harmonize with desirable or acceptable characteristics of the surrounding environment.	Y	Incorporated into the Proposed Action and Alternate Development Alternative.
The operator should bury power collection cables or lines on the site in a manner that minimizes additional surface disturbance.	Y	Incorporated into the Proposed Action and Alternate Development Alternative
Commercial symbols (such as logos), trademarks, and messages should not appear on sites or ancillary structures of wind energy projects. Similarly, billboards and advertising messages should also be prohibited	Y	Incorporated into the Proposed Action and Alternate Development Alternative
Site design should be accomplished to make security lights nonessential. Such lights increase the contrast between a wind energy project and the night sky, especially in rural/remote environments, where turbines would typically be installed. Where they are necessary, security lights should be extinguished except when activated by motion detectors (e.g., only around the substation).	Y	Incorporated as a project-specific BMP in the Lighting Plan (see Appendix C).
Operators should minimize disturbance and control erosion by avoiding steep slopes and by minimizing the amount of construction and ground clearing needed for roads, staging areas, and crane pads. Dust suppression techniques should be employed in arid environments to minimize impacts of vehicular and pedestrian traffic, construction, and wind on exposed surface soils. Disturbed surfaces should be restored as closely as possible to their original contour and revegetated immediately after, or contemporaneously with construction. Action should be prompt to limit erosion and to accelerate restoring the preconstruction color and texture of the landscape.	Y	Whenever possible, existing roads, such as the main north-south access road, would be used and improved to avoid additional disturbance. Additionally, access to Gravel Pit B outside the project area would be along an existing road. Incorporated as project-specific BMPs into SWPPP and SPP and Restoration and Weed Management Plan (Appendices D and A).
The wind development site should be maintained during operation. Inoperative or incomplete turbines cause the misperception in viewers that "wind power does not work" or that it is unreliable. Inoperative turbines should be completely repaired, replaced, or removed. Nacelle covers and rotor nose cones should always be in place and undamaged. Wind energy projects should evidence environmental care, which would also reinforce the expectation and impression of good management for benign or clean power. Nacelles and towers should also be cleaned regularly (yearly, at minimum) to remove spilled or leaking fluids and the dirt and dust that would accumulate, especially in seeping lubricants. Facilities and off-site surrounding areas should be kept clean of debris, "fugitive" trash or waste, and graffiti. Scrap heaps and materials dumps should be prohibited and prevented. Materials storage yards, even if thought to be orderly, should be kept to an absolute minimum. Surplus, broken, disused materials and equipment of any size should not be allowed to accumulate.	Y	Incorporated into the Proposed Action and Alternate Development Alternative and implemented under the COM plan.
Aesthetic offsets should be considered as a mitigative option in situations where visual impacts are unavoidable, or where alternative mitigation options are only partially effective or uneconomical. An aesthetic offset is a correction or remediation of an existing condition located in the same viewshed of the proposed development that has been determined to have a negative visual or aesthetic impact. For example, aesthetic offsets could include reclamation of unnecessary roads in the area, removal of abandoned buildings, cleanup of illegal dumps or trash, or the rehabilitation of existing erosion or disturbed areas.	Y	Incorporated herein; offsets were considered and determined unnecessary.
A Decommissioning Plan should be developed, and it should include the removal of all turbines and ancillary structures and restoration/reclamation of the site.	Y	Incorporated herein; a Decommissioning Plan would be completed as part of the COM Plan; also, the Restoration and Weed Management Plan (see Appendix A) addresses site reclamation.

Table 6.1-1. PEIS Mitigation Rationale (Continued)

Mitigation	Is Mitigation Incorporated Into EA? (Y/N)	Rationale
5.12 Cultural Resources (BLM 2005:5-101 to 5-102)		
The BLM should consult with Native American governments early in the planning process to identify issues and areas of concern regarding the proposed wind energy development. Aside from the fact that consultation is required under the NHPA, consultation is necessary to establish whether the project is likely to disturb traditional cultural properties, affect access rights to particular locations, disrupt traditional cultural practices, and/or visually impact areas important to the tribe(s). Under the conditions of the nationwide BLM Programmatic Agreement, the state BLM offices should already have established a relationship with local tribal governments. A list of the federally recognized tribes for the 11-state region is available in Chapter 7.	Y	Incorporated herein, see Section 7.4.
The presence of archaeological sites and historic properties in the APE should be determined on the basis of a records search of recorded sites and properties in the area and/or an archaeological survey. The SHPO is the primary repository for cultural resource information, and most BLM Field Offices also maintain this information for lands under their jurisdiction.	Y	Completed. Records search, field survey, and report were completed (SWCA 2009d).
Archaeological sites and historic properties present in the APE should be reviewed to determine whether they meet the criteria of eligibility for listing in the NRHP. Cultural resources listed on or eligible for listing in the NRHP are considered “significant” resources.	Y	Completed; no NRHP-eligible sites would be impacted.
When any ROW application includes remnants of a National Historic Trail, is located within the viewshed of a National Historic Trail’s designed centerline, or includes or is within the viewshed of a trail eligible for listing on the NRHP, the operator should evaluate the potential visual impacts to the trail associated with the proposed project and identify appropriate mitigation measures for inclusion as stipulations in the POD.	N	Not applicable.
If cultural resources are present at the site, or if areas with a high potential to contain cultural material have been identified, a Cultural Resources Management Plan should be developed. This plan should address mitigation activities to be implemented for cultural resources found at the site. Avoidance of the area is always the preferred mitigation option. Other mitigation options include archaeological survey and excavation (as warranted) and monitoring. If an area exhibits a high potential, but no artifacts are observed during an archaeological survey, monitoring by a qualified archaeologist could be required during all excavation and earthmoving in the high-potential area. A report should be prepared documenting these activities. The Cultural Resources Management Plan also should 1) establish a monitoring program, 2) identify measures to prevent potential looting/vandalism or erosion impacts, and 3) address the education of workers and the public to make them aware of the consequences of unauthorized collection of artifacts and destruction of property on public land.	Y	All sites would be avoided. A Cultural Resources Monitoring and Discovery Plan (see Appendix E) was created to address any new sites identified during construction.
Periodic monitoring of significant cultural resources in the vicinity of development projects may help curtail potential looting/vandalism and erosion impacts. If impacts are recognized early, additional actions can be taken before the resource is destroyed.	Y	Incorporated in the Cultural Resources Monitoring and Discovery Plan (see Appendix E).
Unexpected discovery of cultural resources during construction should be brought to the attention of the responsible BLM authorized officer immediately. Work should be halted in the vicinity of the find to avoid further disturbance to the resources while they are being evaluated and appropriate mitigation measures are being developed.	Y	Incorporated in the Cultural Resources Monitoring and Discovery Plan (see Appendix E).
5.13 Economics		
No mitigation provided.	N/A	None provided.
5.14 Environmental Justice		
No mitigation provided.	N/A	None provided.

Source: BLM (2005).

This page intentionally left blank.

All BMPs applicable to development of wind projects presented in the Ely RMP/FEIS Appendix F, Section 1 (BLM 2008a), are incorporated by reference. Additionally, mitigation measures for wind development are presented in the Ely RMP/FEIS Appendix F, Section 3 (BLM 2008a). Most of the measures presented in that section are covered by the measures in the PEIS (see Section 6.2). Therefore, only additional measures not included in the PEIS are described in this section.

- All control and mitigation measures established for the project in the POD and resource-specific management plans that are part of the POD shall be maintained and implemented throughout the construction and operation phases, as appropriate (BLM 2008a:Appendix F, Section 3).The number and size/length of roads, temporary fences, laydown areas, and borrow areas shall be minimized (BLM 2008a:Appendix F, Section 3).
- Roads shall be located away from drainage bottoms and avoid wetlands, if practicable (BLM 2008a:Appendix F, Section 3).
- Access roads shall be located to minimize stream crossings. All structures crossing streams shall be located and constructed so that they do not decrease channel stability or increase water velocity. Operators shall obtain all applicable federal and state permits (BLM 2008a:Appendix F, Section 3).
- Ongoing ground transportation planning shall be conducted to evaluate road use, minimize traffic volume, and ensure that roads are maintained adequately to minimize associated impacts (BLM 2008a:Appendix F, Section 3).
- Inoperative turbines shall be repaired, replaced, or removed in a timely manner. Requirements to do so shall be incorporated into the due diligence provisions of the ROW authorization. Operators would be required to demonstrate due diligence in the repair, replacement, or removal of turbines; failure to do so could result in termination of the rights-of-way authorization (BLM 2008a:Appendix F, Section 3).
- Prior to the termination of the rights-of-way authorization, a Decommissioning Plan shall be developed and approved by the BLM. The Decommissioning Plan shall include a Site Reclamation Plan and monitoring program (BLM 2008a:Appendix F, Section 3). The Reclamation Plan is available in Appendix A.
- All management plans, BMPs, and stipulations develop for the construction phase shall be applied to similar activities during the decommissioning phase (BLM 2008a:Appendix F, Section 3).
- Site monitoring protocols defined in the POD shall be implemented. These would incorporate monitoring program observations and additional mitigation measures into standard operating procedures and BMPs to minimize future environmental impacts (BLM 2008a:Appendix F, Section 3).
- Results of monitoring program efforts shall be provided to the BLM authorized officer (BLM 2008a:Appendix F, Section 3).

6.4 Project-specific Mitigation Measures

Mitigation measures presented in this section were developed to address project-specific impacts that are not addressed or fully mitigated by project design features, BMPs, PEIS mitigation measures (see Section 6.2), and RMP/FEIS mitigation measures (see Section 6.3). The following mitigation measures should be completed as part of project implementation:

- If the Proposed Action is selected, relocation of pygmy rabbits by live trapping prior to construction should be considered in consultation with the USFWS and NDOW to avoid direct mortality.

- Prior to construction, a botanist approved by the BLM would identify potential habitat for Parish phacelia within 100 feet of the limits of construction disturbance and conduct site-specific surveys in those areas during the appropriate flowering season (April–August [NNHP 2001]). If individual plants are identified, turbines should be microsited outside the population. If turbines cannot be sited outside of the plant population, plants should be salvaged, as determined appropriate by the BLM's Authorized Officer.
- Following construction activities, as described in the Restoration and Weed Management Plan (see Appendix A), use soil and rock stain on restored areas to reduce the visible color contrast between bare soil and vegetation.
- Per SHPO requirements, complete detailed recordation and specific photodocumentation (prior to construction), of any eligible sites that would be visually impacted by the project will be completed to SHPO (2010) standards.

7.0 CONSULTATION AND COORDINATION

7.1 Introduction

This chapter describes the public participation and agency consultation opportunities made available by the BLM prior to and during preparation of the EA. Public participation helps disclose potential project impacts to the public and identify areas of concern. Agency consultation and coordination helps determine whether BLM actions are consistent with other agencies' land use and development plans. As part of the NEPA process, coordination with federal, state, and local agencies, Native American tribes, and the general public took place to ensure informed decision-making.

A preliminary EA was prepared and provided to the public for review and comment. Additional agency and stakeholder consultation and coordination was also conducted throughout the process. Input from that process was used to inform the preparation of the current EA, similar to scoping information.

7.2 Persons, Groups, and Agencies Consulted

- White Pine County
- U.S. Fish and Wildlife Service
- Nevada Department of Wildlife
- Great Basin National Park
- Southern Nevada Water Authority
- Delamar Valley Cattle
- Cave Valley Cattle
- Confederated Tribes of the Goshute Reservation
- Duckwater Shoshone Tribe
- Ely Shoshone Tribe

7.3 Summary of Public and Agency Participation

On Monday, October 20, 2008, the BLM Ely District staff facilitated a stakeholder meeting. The purpose of the meeting was to provide the project proponent, SVW, with the opportunity to present information on the proposed SVWEF project to stakeholders identified by the BLM and for those stakeholders to get information, ask questions and better understand the proposed project, what tasks have been completed, and what tasks remain to be completed.

Meeting materials included a PowerPoint presentation by SVW, stationary displays describing biological and cultural resource studies completed to date, a map of the project area and proposed developments, a diagram of wind turbine technology, and a visual simulation of proposed developments displayed as a video in Google Earth.

Stakeholders were given 15 minutes at the beginning of the meeting to review meeting materials and stationary displays posted in the conference room. Following an introduction by the BLM, SVW gave a brief presentation on the company, wind energy, and the proposed SVWEF project. Following the presentation, stakeholders had the opportunity to ask questions of the BLM and the proponent related to the project proposal and process. At the conclusion of the meeting, stakeholders were given additional time to review the meeting materials and stationary displays. During that time, BLM staff and SVW staff

remained available to answer further questions. Information gathered during the stakeholder meeting was used to help develop the draft preliminary EA that was published on December 16, 2009.

The draft preliminary EA was made available for public input from December 16, 2009, through January 15, 2010, and public meetings were held to gather input on the document on January 5 and 6, 2009, in Ely, Nevada, and Baker, Nevada, respectively. Thirty-two comment letters containing 531 comments were received from the public, including stakeholders. In all, 386 unique comments were recorded. In addition to comments received on the draft preliminary EA, the BLM held additional meetings with commenting agencies to address specific concerns. Initial meetings with the USFWS, NDOW, and NPS were held on February 26, March 22, and March 23, 2010, respectively. All comments were reviewed and all substantive comments warranting further response as well as information gathered from agency meetings were addressed in the EA by:

- Modifying the Proposed Action;
- Developing an action alternative;
- Supplementing, improving, or modifying the analysis; or
- Making factual corrections.

Additionally, multiple meetings with the USFWS and NDOW were held to address specific avian and bat concerns and update the ABPP (see Appendix F). Individual meetings with the USFWS and NDOW were held on February 26, 2010, and again on March 31, 2010. The meetings on February 26 were held between agencies to discuss specific avian and bat concerns. The meetings on March 31 were held between the agencies and the proponent to discuss concerns and allow to proponent to provide information on past methods used to address avian and bat concerns. A joint meeting between the BLM, USFWS, NDOW, and the proponent was held on April 26, 2010, to discuss the internal draft ABPP. The proponent attended the first half of the meeting to provide additional information on the technologies proposed in the plan. The second half of the meeting was between only the agencies to discuss necessary changes to the plan. A final draft plan was prepared based on that meeting and provided to the USFWS, NDOW, and technical experts (Drs. Michael O'Farrell, Thomas Kunz, and Steven Carothers) for additional comments. The final draft ABPP (see Appendix F) was then developed based on those comments.

The revised preliminary EA was published on July 17, 2010 and made available for public input until August 18, 2010. An unsigned draft FONSI was also issued for public comment based on BLM Handbook H-1790-1, section 8.4.2. Thirty-five comment letters containing 465 comments were received from 7 government agencies, 2 businesses, 14 individuals, 10 organizations, and 2 tribes. Comments were received on the following topics:

- ACEC – 14 comments
- Air Quality – 8 comments
- Biological Resources – 209 comments
- Cultural Resources – 17 comments
- Socioeconomics – 8 comments
- Fire – 3 comments
- Human Environment – 10 comments
- Lands and Realty – 5 comments
- NEPA – 104 comments
- Noise – 2 comments
- POD – 4 comments

- Recreation – 3 comments
- Range – 2 comments
- Transportation – 6 comments
- Visual – 63 comments
- Water – 7 comments

Appendix H provides a summary of comments received and responses to comments.

7.4 Summary of Tribal Consultation

The following is a list of federal laws and EOs requiring Native American tribal consultation:

- AIRFA (16 USC 1996)—AIRFA establishes the policy of the federal government "to protect and preserve for American Indians their inherent right of freedom to believe, express, and exercise the traditional religions of the American Indian."
- ARPA of 1979 (16 USC 470aa–mm)—ARPA requires federal agencies to consult with tribal authorities before permitting archeological excavations on tribal lands (16 USC 470cc(c)). It also mandates the confidentially of information concerning the nature and location of archeological resources, including tribal archeological resources.
- NHPA (16 USC 470 et seq.)—In carrying out its responsibilities under Section 106 of the NHPA, a federal agency shall consult with any Indian tribe or Native Hawaiian organization that attaches religious and cultural significance to properties described in subparagraph (A) (Section 101(d)(6)(B)) Implementing Regulations (36 CFR Part 800).
- NAGPRA (25 USC 3001, et. seq.)—NAGPRA requires consultation with Indian tribes, traditional religious leaders and lineal descendants of Native Americans regarding the treatment and disposition of specific kinds of human remains, funerary objects, sacred objects, and other items. Implementing Regulations (43 CFR 10)
- NEPA Implementing Regulations (40 CFR 1500)—While the statutory language of NEPA does not mention Indian tribes, the CEQ regulations and guidance do require agencies to contact Indian tribes and provide them with opportunities to participate at various stages in the preparation of an EA or EIS. Section 40 CFR 1501.2(d)(2) requires that federal agencies consult with Indian tribes early in the NEPA process. Other sections also refer to interacting with Indian tribes while implementing the NEPA process.
- EO 13175: Consultation and Coordination with Indian Tribal Governments (November 6, 2000)
- EO 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (February 11, 1994)—Published in the *Federal Register*, 59 FR 7629, Wednesday, February 16, 1994.
- Bureau of Land Management Manual 8120: Tribal Consultation under Cultural Resource Authorities (2004).

The BLM has complied with consultation policy for the federally recognized Native American tribal governments that may have concerns regarding the proposed SVWEF project in accordance to the laws, EOs, and regulations listed above. The following is a summary of the consultation and coordination that has occurred.

The following Native American tribes were invited to attend the SVWEF stakeholder meeting on Monday, October 20, 2008, to obtain project information:

- Ely Shoshone Tribe
- Duckwater Shoshone Tribe
- Confederated Tribes of the Goshute Indian Reservation

Two representatives of the Confederated Tribes of the Goshute Indian Reservation were present at the SVWEF stakeholder meeting. No representatives of the Ely Shoshone Tribe or the Duckwater Shoshone Tribe attended the meeting.

The BLM Ely District Office conducts quarterly Native American coordination meetings at which proposed projects are presented by the BLM to the tribal representatives present. The tribal representatives have the opportunity at that time to ask questions, make comments, and raise concerns regarding specific proposed actions. The proposed SVWEF was presented during the quarterly coordination meeting held on September 17, 2009. Representatives for the Ely Shoshone Tribe, Duckwater Shoshone Tribe, and Confederated Tribes of the Goshute Indian Reservation were present. The tribal representatives present declined to provide comments on the SVWEF at that time.

Official government to government consultation was initiated on January 5, 2010, in the form of an official letter from the BLM, Ely District, Schell Field Office Manager, Mary D'Aversa. The consultation letter officially informed Native American tribes within the Ely District Office jurisdiction and surrounding region of the proposed SVWEF project and invited them to provide information to the BLM regarding any traditional religious and/or cultural sites of importance within the proposed project area. The letter was prepared and submitted in compliance with EO 13175 Consultation and Coordination with Indian Tribal Governments and the NHPA, Section 106, government to government Native American consultation. The letter was sent to the following tribes:

- Battle Mountain Band Council
- Cedar City Band of Paiutes
- Confederated Tribes of the Goshute Indian Reservation
- Duckwater Shoshone Tribe
- Elko Band Council
- Ely Shoshone Tribe
- Indian Peaks Band
- Kaibab Band of Paiutes Indians
- Las Vegas Paiute Tribe
- Moapa Band of Paiutes
- Paiute Indian Tribe of Utah
- Shivwits Band of Paiutes
- Skull Valley Band of Goshutes
- South Fork Band Council
- Te-Moak Tribes of the Western Shoshone Indians of Nevada
- Wells Band Council
- Yomba Shoshone Tribe
- Moapa Band of Paiutes

In response to the January 5, 2010, consultation letter, the Confederated Tribes of the Goshute Indian Reservation invited the BLM to attend their January 8, 2010, Business Council Meeting to discuss concerns regarding the proposed SVWEF. The BLM was represented by Schell Field Office Manager Mary D'Aversa, Renewable Energy Project Manager, Wells McGiffert, BLM Tribal Coordinator Elvis Wall, and Archaeologist Shawn Gibson. The tribe's primary concerns focused on impacts and possible mitigations to unanticipated discovery of possible Native American graves and the proposed Swamp Cedar Traditional Cultural Property (TCP). No other tribes provided information in response to the formal request for consultation by the BLM.

The draft *Preliminary Spring Valley Proposed Wind Energy Facility Project Environmental Assessment (DOI-BLM-NV-L020-2010-007-EA)* was issued for a 30-day comment period from December 16, 2009, through January 15, 2010, and public meetings were held to gather input on the document on January 5 and 6, 2010, in Ely, Nevada, and Baker, Nevada.

The Duckwater Shoshone Tribe provided a letter to the BLM commenting on the draft Preliminary EA. The Duckwater stated they felt the document was lacking essential information and needed to include measures to address Native American concerns. They also inquired about the steps necessary for nominating the two massacre sites located in Spring Valley to the NRHP. The issues raised by the tribe were addressed in the revised Preliminary EA by incorporation and because the comments received were submitted though the public comment process, no tribal meetings regarding the comments were held, which is consistent with how all public comments were addressed.

The Confederated Tribes of the Goshute Indian Reservation provided a letter to the BLM commenting on the draft Preliminary EA. The Goshutes stated that the project occurs where there are sacred sites and would have an adverse effect if the project altered any properties that qualify for listing in the NRHP. Additional correspondence was received by BLM through email that expressed concerns regarding the adjacent SNWA groundwater project. Issues raised by the tribe regarding the EA were addressed in the revised Preliminary EA by incorporation.

The revised *Preliminary Spring Valley Proposed Wind Energy Facility Project Environmental Assessment (DOI-BLM-NV-L020-2010-007-EA)* was issued for a 30-day public comment period from July 19 to August 18, 2010. Following the beginning of the comment period on the revised preliminary EA, the Confederated Tribes of the Goshute Indian Reservation, the Duckwater Shoshone Tribe, and the Ely Shoshone Tribe were invited by the BLM to attend a meeting at the Swamp Cedar ACEC held on July 28, 2010, to discuss the proposed Swamp Cedar TCP. The Confederated Tribes of the Goshute Indian Reservation attended and were represented by three members. The Duckwater Shoshone Tribe was present and was represented by two members. The Ely Shoshone did not attend. The BLM was represented by Schell Field Office Non-Renewable Supervisor Gary Medlyn, Tribal Coordinator Elvis Wall, Archaeologist Shawn Gibson, Student Career Experience Program Archaeologist Lorie Lesher, and Cultural Anthropology Intern Jeremy Trombley. The meeting resulted in an increased understanding by the BLM of the importance of the proposed TCP, and included the determination of a recommended boundary for the proposed TCP (pending final review) that is being completed though an independent process.

In August 2010, both the Confederated Tribes of the Goshute Indian Reservation and the Duckwater Shoshone Tribe provided letters to the BLM commenting on the revised *Preliminary Spring Valley Proposed Wind Energy Facility Project Environmental Assessment (DOI-BLM-NV-L020-2010-007-EA).* Their comments are summarized in Appendix H and have been addressed in this Final EA. In addition, the BLM replied directly to the tribes with an official letter.

7.5 List of Preparers/Reviewers

Name	Title	Affiliation	Responsibility
BLM			
Gina Jones	Ecologist/NEPA Coordinator	BLM	Project Management; NEPA Review
Wells McGiffert	Renewable Energy Project Manager	BLM	Project Management
Sheri Wysong	NEPA Coordinator	BLM	NEPA Review, Environmental Justice

Name	Title	Affiliation	Responsibility
Brenda Linnell	Realty Specialist	BLM	Lands and Realty, Socioeconomics
Dave Jacobson	Wilderness Specialist	BLM	ACECs
Shawn Gibson	Archaeologist	BLM	Cultural and Paleontological Resources, Native American Concerns, and Environmental Justice Cultural ACECs
Thomas Maeder	Wildlife Biologist	BLM	Wildlife and Special-status Species
Elvis Wall	Native American Coordinator	BLM	Native American Concerns and Environmental Justice Cultural ACECs
Elizabeth Townley	Outdoor Recreation Planner	BLM	Recreation and Visual Resources
Mindy Seal	Noxious and Invasive Weeds Coordinator	BLM	Noxious Weeds and Invasive Species
Dave Davis	Geologist	BLM	Mineral Resources
Craig Hoover	Rangeland Management Specialist	BLM	Rangeland and Grazing
Mark D'Aversa	Hydrologist	BLM	Soil Resources and Watershed
Gary Medlyn	Assistant Field Manager, Non-renewable Resources	BLM	Document Review
Zach Peterson	Forester	BLM	Forestry
Brian Amme	State Office Planning and Environmental Coordinator	BLM State Office	NEPA Review
Erin Eastvedt	State Office Renewable Energy Project Coordinator	BLM State Office	NEPA Review
Sandra Brewer	State Office Program Lead Wildlife, T&E	BLM State Office	NEPA Review
Non-BLM Preparers			
Lynn Alexander	Environmental Protection Specialist, DOE NEPA Document Manager	DOE	DOE Purpose and Need, Greenhouse Gases, Intentional Destructive Acts
Eric Koster	Project Manager	SWCA	Project Management, Document Quality Assurance/Quality Control, Final Document Production
Steve Leslie	Assistant Project Manager	SWCA	Chapters 1 and 2, Visual Resources, Recreation, Socioeconomics, and Environmental Justice
Justin Streit	Environmental Specialist/Avian Ecologist	SWCA	Wildlife, Special-status Wildlife Species, and Migratory Birds
Matt Villaneva	Environmental Specialist/Botanist	SWCA	Special-status Plant Species, Grazing
Lesley Hanson	Environmental Specialist/Biologist	SWCA	Wildlife, Special-status Wildlife Species
Michael Swink	Environmental Planner	SWCA	Prime and Unique Farmlands, ACECs, Transportation and Access
Camille Ensle	Publication Specialist	SWCA	Formatting of Document
Linda Burfitt	Publication Specialist	SWCA	Formatting of Document
Heidi Orcutt-Gachiri	Technical Editor	SWCA	Technical Editing of Document

8.0 LITERATURE CITED

Able, K.P. 1970. A radar study of the altitude of nocturnal passerine migration. *Bird-Banding* 41(4, October):282–290.

Aikens, C.M., and D.B. Madsen prehistory of the eastern area. In *Great Basin*, edited by W. L. d'Azevedo, pp. 149–160. Handbook of North American Indians, Vol. 11, William C. Sturtevant, general editor. Washington, D.C.: Smithsonian Institution Press.

American Wind Energy Association. 2009. Wind energy and wildlife: frequently asked questions. Available at: <http://www.awea.org/pubs/factsheets/Wildlife_FAQ.pdf>. Accessed November 6, 2009.

———. 2010. Resources: wind energy and the environment. Available at: <http://www.awea.org/faq/wwt_environment.html#Will%20wind%20energy%20hurt%20tourism%20in%20my%20area>. Accessed July 8, 2010.

Anderson, R., N. Neumann, J. Tom, W.P. Erickson, M.D. Strickland, M. Bourassa, K.J. Bay, and K.J. Sernka. 2004. Avian Monitoring and Risk Assessment at the Tehachapi Pass Wind Resource Area. Period of Performance: October 2, 1996–May 27, 1998. NREL/SR-500-36416. National Renewable Energy Laboratory.

Avian Power Line Interaction Committee. 2006. R. Harness, contributing author to: Suggested Practices for Avian Protection on Power Lines: State of the Art in 2006. Edison Electric Institute, Avian Power Line Interaction Committee, and the California Energy Commission. Washington, D.C. and Sacramento, CA.

Arnett, E. B., technical editor. 2005. *Relationships between bats and wind turbines in Pennsylvania and West Virginia: an assessment of bat fatality search protocols, patterns of fatality, and behavioral interactions with wind turbines*. A final report submitted to the Bats and Wind Energy Cooperative. Bat Conservation International. Austin, Texas, USA.

Arnett, E.B., W.K. Brown, W.P. Erickson, J.K. Fiedler, B.L. Hamilton, T.H. Henry, A. Jain, G.D. Johnson, J. Kerns, R.R. Koford, C.P. Nicholson, T.J. O'Connell, M.D. Piorkowski, and R.D. Tankersley Jr. 2008. *Patterns of Bat Fatalities at Wind Energy Facilities in North America*. Journal of Wildlife Management. 72(1):61–78.

Arnett, E. B., M. Schirmacher, M. M. P. Huso, and J. P. Hayes. 2009. *Effectiveness of changing wind turbine cut-in speed to reduce bat fatalities at wind facilities*. An annual report submitted to the Bats and Wind Energy Cooperative. Bat Conservation International. Austin, Texas, USA.

Baerwald, E.F., G.H. D'Amours, B.J. Klug, and R.M.R. Barclay. 2008. Barotrauma is a significant cause of bat fatalities at wind turbines. *Current Biology* 18:R695–R696.

Beck, C., and G.T. Jones. 1997. The Terminal Pleistocene/Early Holocene archaeology of the Great Basin. *Journal of World Prehistory* 11:161–236.

Beranek, L. 1988. *Noise and Vibration Control*. Rev. ed. Washington, D.C.: Institute of Noise Control Engineering.

Bortle, J.E. 2001. The Bortle Dark Sky Scale. *Sky and Telescope* (February).

Bradley, P.V., M.J. O'Farrell, J.A. Williams, and J.E. Newmark (eds.). 2006. *The Revised Nevada Bat Conservation Plan*. Reno: Nevada Bat Working Group.

Braun, C.E. 1998. Sage-grouse declines in western North America: what are the problems? In *Proceedings of the Western Association of State Fish and Wildlife Agencies*, Vol. 67, pp. 134–144.

Brown, W.K., and B.L. Hamilton. 2004. *Bird and Bat Monitoring at the McBride Lake Wind Farm, Alberta 2003–2004*. Prepared for Vision Quest Windelectric Inc. Calgary, AB. Prepared by TAEM Ltd., Calgary, AB, and BLH Environmental Services, Pincher Creek, AB.

Bureau of Land Management (BLM). 1980. *Visual Resource Management Program*. Washington, D.C.: U.S. Government Printing Office.

———. 1985. *BLM Roads Manual*. BLM Manual 9113.

———. 1988. Areas of Critical Environmental Concern. BLM Manual 1613.

———. 1992. *Visual Resource Management*. BLM Handbook 8400.

———. 1998. *Las Vegas Resource Management Plan and Final Environmental Impact Statement*. Vols. 1 and 2. Las Vegas: U.S. Department of the Interior, Bureau of Land Management, Las Vegas Field Office.

———. 2005. *Final Programmatic Environmental Impact Statement on Wind Energy Development on BLM-Administered Lands in the Western United States*. U.S. Department of the Interior, Bureau of Land Management. June.

———. 2007. Burned Area Emergency Stabilization and Rehabilitation Handbook. BLM Manual H-1742-1. Available at: <http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information_Resources_Management/policy/blm_handbook.Par.52739.File.dat/h1742-1.pdf>. Accessed October 27, 2009.

———. 2008a. *Ely Resource Management Plan and Final Environmental Impact Statement*. Ely: U.S. Department of the Interior, Bureau of Land Management, Ely District Office.

———. 2008b. Desert land entries. Available at: <http://www.blm.gov/ut/st/en/res/utah_public_room/desert_land_entries.html>. Accessed July 14, 2009.

———. 2008c. *National Environmental Policy Act Handbook*. BLM Handbook H-1790-1.

———. 2009 GeoCommunicator. NILS – National Integrated Land System in Partnership with the U.S. Forest Service. Available at: <http://www.geocommunicator.gov/GeoComm/index.shtm>. Accessed March 26, 2009.

Connelly, J.W., S.T. Knick, M.A. Schroeder, and S.J. Stiver. 2004. *Conservation Assessment of Greater Sage-Grouse and Sagebrush Habitats*. Unpublished report. Cheyenne, Wyoming: Western Association of Fish and Wildlife Agencies.

Crum, S.J. 1994. *The Road on which We Came*. Salt Lake City: University of Utah.

Dark Sky Partners. 2010. *An Assessment of the Impact of the Spring Valley Wind Energy Facility on the Dark Skies of Great Basin National Park.*

d'Azevedo, W. L. 1986. Great Basin. Handbook of North American Indians, Vol. 11, edited by W. C. Sturtevant. Washington, D.C.: Smithsonian Institution.

Ehrlich, P.R., D.S. Dobkin, and D. Wheye. 1988. *The Birder's Handbook: A Field Guide to the Natural History of North American Birds*. Toronto, Ontario: Simon and Schuster Inc.

Energy Information Administration (EIA). 2009. Annual Energy Outlook 2009: with projections to 2030. March. Available at: <http://www.eia.doe.gov/oiaf/aeo/>. Accessed October 19, 2009.

Erickson, W.P., G. Johnson, M.D. Strickland, D.P. Young, Jr., K.J. Sernka, and R.E. Good. 2001. *Avian Collisions with Wind Turbines: A Summary of Existing Studies and Comparisons to Other Sources of Avian Collision Mortality in the United States*. National Wind Coordinating Committee Resource Document. Cheyenne, Wyoming: Western EcoSystems Technology, Inc.

Erickson, W.P., G. Johnson, D. Young, D. Strickland, R. Good, M. Bourassa, K. Bay, and K. Sernka. 2002. *Synthesis and Comparison of Baseline Avian and Bat Use, Raptor Nesting and Mortality Information from Proposed and Existing Wind Developments*. Prepared for Bonneville Power Administration. Cheyenne, Wyoming: Western EcoSystems Technology, Inc.

Estep Environmental. 2007. *Environmental Screening Analysis for the G3 Wind Energy Project, Spring Valley, Nevada*.

Floyd, T., et al (eds.). 2007. *Atlas of the Breeding Birds of Nevada*. University of Nevada Press.

Grayson, D.K. 1993. *The Desert's Past: A Natural Prehistory of the Great Basin*. Washington, D.C.: Smithsonian Institution Press.

Harris, C.M. 1998. *Handbook of Acoustical Measurements and Noise Control*. 3rd ed. McGraw Hill, Inc.

Hoen, B., R. Wiser, P. Cappers, M. Thayer, and G. Sethi. 2009. *The Impact of Wind Power Projects on Residential Property Values in the United States: A Multi-Site Hedonic Analysis*. Washington D.C. December.

Intergovernmental Panel on Climate Change (IPCC). 2007. Fourth Assessment Report, Climate Change 2007: Synthesis Report, Summary for Policy Makers, released in Valencia, Spain, November 17, 2007.

Johnson, G.D., D. Young, D., W. Erikson, Derby, C., Strickland, R., Good. 2000. *Wildlife Monitoring Studies Sea West Windpower Project, Carbon County, Wyoming 1995–1999*. Final Report prepared for Sea Rawlins, Wyoming. Cheyenne, Wyoming: Western EcoSystems Technology, Inc. August 9.

Kelly, R.L. 1997. Late Holocene Great Basin Prehistory. *Journal of World Prehistory* 11(1):1–50.

Kerlinger, P., R. Curry, L. Culp, A. Jain, C. Wilkerson, B. Fischer, and A. Hasch. 2006. *Post-Construction Avian and Bat Fatality Monitoring Study for the High Winds Wind Power Project Solano County, California: Two Year Report*. Prepared for High Winds, LLC, FPL Energy.

Kingsley, A., and B. Whittam. 2005. *Wind Turbines and Birds–A Background Review for Environmental Assessment*. Prepared for Environment Canada/Canadian Wildlife Service. May 12.

Kleinfelder, Inc. 2009a. *Preliminary Geotechnical Engineering Evaluation Report: Proposed Spring Valley Wind Farm, White Pine County, Nevada*.

———. 2009b. *Borrow Study Investigation and Thermal Resistivity Testing Letter Report: Spring Valley Wind Farm Project, White Pine County, Nevada*.

———.2010. *Results of Preliminary Hydrogeologic Review (Draft), Proposed Spring Valley Wind Farm, White Pine County, Nevada*.

Lahren, S.L., Jr., G.R. Seymour, M. Cannon, and S. Creer. 2009. *Ethnographic Investigations for the Spring Valley Wind Facility in White Pine County, Nevada*. Project No. 14417, 15888; Cultural Resources Report No. 2009-403. SWCA Environmental Consultants.

Leddy, K.L., K.F. Higgins, and D.E. Naugle. 1999. Effects of wind turbines on upland nesting birds in conservation reserve program grassland. *Wilson Bulletin* 111:100–104.

Madsen, D.B., and S.R. Simms, 1998. The Fremont complex: a behavioral perspective. *Journal of World Prehistory* 12(3):255–336.

Madsen, D.B., C.G. Oviatt, and D.N. Schmitt. 2005. A geomorphic, environmental, and cultural history of the Camels Back Cave Region. In *Camels Back Cave*, edited by D.N. Schmitt and D.B. Madsen. Anthropological Papers No. 125. Salt Lake City: University of Utah Press.

McCracken, G.F. 1996. Bats aloft: a study of high altitude foraging. Available at: <http://www.batcon.org/archives/batsmag/v14n3-3.html>. Accessed July 13, 2009.

National Energy Policy Development Group. 2001. National Energy Policy. Available at: <http://www.ne.doe.gov/pdfFiles/nationalEnergyPolicy.pdf>. Accessed July 9, 2010.

National Park Service. 2007. Great Basin National Park outdoor activities. Available at: <http://www.nps.gov/grba/planyourvisit/outdooractivities.htm>. Accessed April 9, 2009.

National Wind Coordinating Collaborative (NWCC). 2010. Wind Turbine Interactions with Birds, Bats, and Their Habitats: A Summary of Research Results and Priority Questions. Available at: <https://www.nationalwind.org/assets/publications/Birds_and_Bats_Fact_Sheet_.pdf>. Accessed September 27, 2010.

NatureServe. 2008. Association for Biodiversity Information. Available at: <http://www.natureserve.org/>. Accessed March 2010.

Nevada Department of Taxation. 2009. *Annual Report Fiscal 2007–2008*. Carson City, Nevada. January 15.

Nevada Department of Transportation (NDOT). 2009. 2008 Annual Traffic Report, June 10, 2009. Available at: <http://www.nevadadot.com/reports_pubs/traffic_report/2008/>. Accessed October 30, 2009.

Nevada Department of Wildlife (NDOW). 2004. *Greater Sage-Grouse Conservation Plan for Nevada and Eastern California.* 1st ed. Prepared by Governor's Sage Grouse Conservation Team. June 30.

———. 2009. Nevada hunter information sheet. Available at: <http://www.ndow.org/hunt/resources/infosheets/>. Accessed April 8, 2009.

———. 2010. Living with mountain lions in Nevada. Available at: <http://ndow.org/about/pubs/pdf/brochure/mountain_lion.pdf>. Accessed on June 16, 2010.

Nevada Natural Heritage Program (NNHP). 2001. Nevada Rare Plant Atlas. Available at: <http://heritage.nv.gov/atlas/atlasndx.htm>. Accessed November 6, 2009.

Nevada State Demographer. 2008. *Nevada County Population Projections 2008 to 2028.* Available at: <http://www.nsbdc.org/what/data_statistics/demographer/pubs/>. Accessed on October 13, 2010.

O'Farrell M.J., and W.L. Gannon. 1999. A comparison of acoustic versus capture techniques for the inventory of bats. *Journal of Mammalogy* 80(1):24–30.

Piorkowski, M.D. 2006. Breeding Bird Habitat Use and Turbine Collision of Birds and Bats Located at a Wind Farm in Oklahoma Mixed-Grass Prairie. M.A. thesis, Oklahoma State University.

Seymour, G., and V. Villagran. 2010. *Cultural Resources Monitoring and Discovery Plan for the Spring Valley Wind Energy Facility, White Pine County, Nevada*. Prepared for the Ely District Bureau of Land Management. SWCA Environmental Consultants.

Sherwin, R.E. 2009. *A Study on the Use of Rose Guano Cave, Nevada by Mexican Free-Tailed Bats* (Tadarida brasiliensis). Christopher Newport University.

Smith, J.P. 2008. *Fall 2007 Raptor Migration Studies in the Goshute Mountains of Northeastern Nevada*. Salt Lake City, Utah: HawkWatch International, Inc.

Smith, J.P. 2009. HawkWatch International. Verbal Communication. January 2009.

Southern Nevada Water Authority (SNWA). 2008. *Clark, Lincoln, and White Pine Counties Groundwater Development Project Draft Conceptual Plan of Development*. December.

———. 2009. In-state groundwater resources. Available at: <http://www.snwa.com/html/wr_groundwater_instate.html#spring>. Accessed November 6, 2009.

State Historic Preservation Office (SHPO). 2010. Documentation Standards for Historical Resources of Local and State Significance. Available at: <http://nvshpo.org/index.php?option=com_content&task=view&id=61&Itemid=9>. Accessed on October 15, 2010.

Steward, Julian H. 1938. *Basin-Plateau Aboriginal Socio-Political Groups*. Bulletin Number l20. Bureau of American Ethnology. Washington: Government Printing Office.

SWCA Environmental Consultants (SWCA). 2009a. *Spring Valley Wind Power Generating Facility Final Pre-construction Survey Results Report for Birds and Bats*.

———. 2009b. *Spring Valley Wind Biological Resources Report*.

———. 2009c. *Ethnographic Investigations for the Spring Valley Wind Facility in White Pine County, Nevada*.

———. 2009d. *Class III Cultural Resources Inventory of the Spring Valley Wind Facility in White Pine County, Nevada*.

———. 2009e. *Spring Valley Wind Visual Resources Assessment*.

Tavares, S. 2010. It's man vs. bird in quest for power. Las Vegas Sun. Saturday, March 6, 2010. Available at: <http://m.lasvegassun.com/news/2010/mar/06/its-man-vs-bird-quest-power/>. Accessed March 16, 2010.

Tesky, J.L. 1994. *Aquila chrysaetos*. Available at: <http://www.fs.fed.us/database/feis/>. Accessed April 9, 2009.

U.S. Census Bureau (Census Bureau). 2000. Fact Finder. Available at: <http://factfinder.census.gov/home/saff/main.html?_lang=en>. Accessed June 16, 2009.

U.S. Department of Energy (DOE). 2008. 20% Renewable Energy by 2030: Increasing Wind Energy's Contribution to U.S. Electricity Supply. DOE/GO-102008-2567. July. Available at: <http://www.20percentwind.org/20p.aspx?page=Report>. Accessed March 2, 2009.

U.S. Department of the Interior and U.S. Department of Agriculture. 2007. *Surface Operating Standards for Oil and Gas Exploration and Development (The Gold Book).*

U.S. Environmental Protection Agency (EPA). 1974. *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*. Report No. EPA/ONAC 550/9-74-004. Washington, D.C.: Prepared by U.S. Environmental Protection Agency, Office of Noise Abatement and Control. March.

U.S. Geological Survey (USGS). 2004. Southwest Regional Gap Analysis Project Field Sample Database. Version 1.1. RS/GIS Laboratory, College of Natural Resources, Utah State University.

U.S. Fish and Wildlife Service (USFWS). 2009. Pygmy rabbit fact sheet. Available at: <http://www.fws.gov/Nevada/nv_species/pygmy_rabbit.html>. Accessed May 10, 2009.

Ulmschneider, H. 2004. *Surveying for Pygmy Rabbits* (Brachylagus idahoensis) – *Fourth Draft*. Idaho BLM, Boise District. June 3.

Villagran, V., M. Cannon, S. Meess, L.B., M. Corbeil, S. Yeiter, K. Altizer, S. Whitesides, and S. Lahren. 2009. *Class III Cultural Resources Inventory of the Spring Valley Wind Facility in White Pine County, Nevada*. Prepared for Spring Valley Wind LLC. SWCA Environmental Consultants.

Walter, W., D. Leslie, and J. Jenks. 2006. Response of Rocky Mountain elk (*Cervus elaphus*) to wind-power development. *American Midland Naturalist*.

White Pine County Public Land Users Advisory Committee. 2007. Ely, Nevada, White Pine County. Available at: <http://lands.nv.gov/docs/SLUPA/WhitePinePlan.pdf>. Accessed December 14, 2009.

White Pine County Tourism and Recreation Board. 2008. Ely, Nevada, White Pine County. Available at: <http://elynevada.net/Level1/live.htm#Demographics>. Accessed June 15, 2009.

Williams, J. 2008. Nevada Department of Wildlife. Verbal Communication.

Windustry. 2009. How much do wind turbines cost? Available at: <http://www.windustry.org/how-much-do-wind-turbines-cost>. Accessed November 5, 2009.

Young, Jr., D.P., W.P. Erickson, R.E. Good, M.D. Strickland, and G.D. Johnson. 2003. *Avian and Bat Mortality Associated with the Initial Phase of the Foote Creek Rim Windpower Project, Carbon County, Wyoming*. Prepared for Pacificorp, Inc., SeaWest Windpower, Inc., and the Bureau of Land Management. Cheyenne, Wyoming: Western EcoSystems Technology, Inc.

APPENDIX A

Restoration and Weed Management Plan

This page intentionally left blank.

APPENDIX B

Traffic Management Plan

This page intentionally left blank.

APPENDIX C

Lighting Plan

This page intentionally left blank.

APPENDIX D

Stormwater Pollution Prevention and Spill Prevention Requirements Plan

This page intentionally left blank.

APPENDIX E

Cultural Resources Monitoring and Discovery Plan

This page intentionally left blank.

APPENDIX F

Avian and Bat Protection Plan

This page intentionally left blank.

APPENDIX G

Weed Risk Assessment

This page intentionally left blank.

APPENDIX H

Preliminary EA Comment Responses

This page intentionally left blank.