

4.0 Environmental Consequences

The Proposed Action, alternatives, and Western’s proposed switching station outlined in Chapter 2, may cause, directly or indirectly, changes in the human and physical/natural environment. This DEIS assesses and analyzes these potential changes and discloses the impacts to decision makers and the public. This process of disclosure is one of the fundamental aims of NEPA.

The following sections define and clarify the concepts and terms used in this EIS when discussing the impacts assessment.

Impacts

Impacts may refer to ecological, aesthetic, historical, cultural, economic, social, or health-related phenomena that may be caused by the Proposed Action or alternatives. Impacts may be direct, indirect, or cumulative.

Direct Impacts

A direct effect occurs at the same time and place as the action. Direct and indirect impacts are discussed in combination under each affected resource.

Indirect Impacts

Indirect impacts are reasonably foreseeable impacts that occur later in time or are separated by some distance from the action. Direct and indirect impacts are discussed in combination under each affected resource.

Cumulative Impacts

Impacts on a resource are cumulative when added to the impacts (or anticipated impacts) from other past, present, or future projects in the cumulative impacts area for the Proposed Project. The cumulative impacts area may be larger than the direct impacts area.

Residual Impacts

Impacts are considered residual when the effect from the Proposed Project cannot be completely avoided or minimized and remains after or despite mitigation.

Significance

“Significant” has a very particular meaning when used in a NEPA document. Significance is defined by the CEQ (40 CFR 1508.27) as a measure of the *intensity* and *context* of the impacts of a major federal action on, or the importance of that action to, the human environment. Significance is a function of the beneficial and adverse impacts of an action on the environment.

Intensity refers to the severity or level of magnitude of impact. Public health and safety, proximity to sensitive areas, level of controversy, unique risks, or potentially precedent-setting effects are all factors to be considered in determining the intensity of the effect.

Context means that the effect(s) of an action must be analyzed within a framework or within physical or conceptual limits. Resource disciplines, location, type, or size of area affected (e.g., local, regional, national), and affected interests are all elements of context that ultimately determine significance. Both long- and short-term impacts are relevant.

Impact Indicators

Use of the term “significant” when referring to impacts indicates that some threshold was exceeded for a particular impact indicator. Impact indicators are the consistent currency used to determine quality, intensity, and duration of change in a resource. Working from an established existing condition (i.e., the

1 baseline conditions described in Chapter 3), this indicator would be used to predict or detect change in a
2 resource related to causal impacts of proposed actions.

3 **Mitigation**

4 Where applicable, mitigation measures are proposed in this document. Mitigation measures are solutions
5 to environmental impacts that are applied in the impact analysis to reduce intensity or eliminate the
6 impacts. To be adequate and effective, CEQ regulations (40 CFR 1508.20) require that mitigation
7 measures fit into one of five categories:

- 8 1. Avoiding the impact altogether by not taking a certain action or parts of an action;
- 9 2. Minimizing impacts by limiting the degree or magnitude of the action and its implementation;
- 10 3. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
- 11 4. Reducing or eliminating the impact over time by preservation and maintenance operations during
12 the life of the action; or
- 13 5. Compensating for the impact by replacing or providing substitute resources or environments.

1 **4.1 Geology, Soils, and Mineral Impacts**

2 This section discusses impacts on existing geology, soils, and minerals that might occur with the
3 implementation of the Proposed Action or alternatives.

4 **4.1.1 Indicators**

5 The Proposed Action would affect geologic, soils, and mineral resources or be affected by geologic-,
6 soils- or mineral-related hazards if it:

- 7 • Is located on a geologic unit that is unstable or would become unstable as a result of the Proposed
8 Action and result in on- or offsite landslides, lateral spreading, subsidence, liquefaction, or
9 collapse;
- 10 • Results in physical alteration of or damage to geologic features;
- 11 • Presents a significant threat to public safety due to damage to project components by geologic
12 hazards;
- 13 • Is located on existing unpatented mining claims and on Notices or Plans of Operations that have
14 been approved by the BLM for the unpatented claims;
- 15 • Permanently removes locatable mineral exploration and appropriation acreage underneath some
16 of the proposed WTG foundations;
- 17 • Permanently removes locatable mineral exploration and appropriation acreage adjacent to the
18 proposed WTG foundations necessary for their structural stability (structural set-back); or
- 19 • Permanently removes locatable mineral exploration and appropriation acreage adjacent to the
20 proposed WTG foundations necessary for a safety set-back area to protect mining claim holders
21 working on their claims from potentially being injured from a WTG blade throw hazard (safety
22 set-back).

23 In order to compare effects associated with the Proposed Action and alternatives project elements, the
24 indicators were considered both independently and in conjunction with one another using the following
25 assumptions.

26 The area of the WTG footprint and the necessary structural set-back was conservatively estimated as
27 follows: Each WTG foundation would consist of a footprint of about 2,500 square feet of rebar-reinforced
28 concrete, if the foundation is in unconsolidated rock. Each WTG foundation footprint located in
29 competent rock would be much less because the foundation would consist of an excavation into the rock;
30 the depth and circumference of each rock foundation excavation would depend on site-specific
31 geotechnical conditions. A 2,500-square-foot WTG footprint would be about 56 feet in diameter. The
32 structural set-back was estimated by adding 104 feet to the footprint diameter. This 160-foot diameter
33 (footprint plus set-back) would equal 0.46 acre. For simplicity, the area of each WTG footprint plus its
34 set-back was rounded up to 0.5 acre.

35 A blade throw safety set-back for each WTG was estimated by using a circle around each WTG with a
36 radius of 886 feet. This is a conservative safety set-back using an estimated maximum blade height of 295
37 feet multiplied by a factor of 3 (based on blade throw studies summarized in Larwood [2006]). The safety
38 set-back area based on an 886-foot radius would be approximately 57 acres for each WTG. This safety
39 set-back was used to evaluate potential impacts on unpatented mining claims touching or within the safety
40 set-back for each alternative.

1 **4.1.2 Geology Direct and Indirect Effects by Alternative**

2 This section describes the effects under each alternative using the respective methodology prescribed
3 under NEPA. To compare effects, this analysis defines the temporal scale (time), spatial extent (area), and
4 intensity of effects for each alternative. All effects discussed in this section are direct. No indirect effects
5 were identified for geology, soils, and mineral resources.

6 **4.1.2.1 No Action Alternative**

7 Under the No Action Alternative, the ROW applications would be denied and the Proposed Project would
8 not be built; therefore, no project related effects on geology, soils, and mineral resources would occur.

9 **4.1.2.2 Proposed Action – 96 WTG Layout Alternative**

10 Under the 96 WTG Layout Alternative, the BLM would approve the ROW applications and the Proposed
11 Action and Western’s proposed switching station would be carried forward. Effects that could result from
12 the implementation of Proposed Action and Western’s proposed switching station during construction,
13 O&M, or decommissioning activities are analyzed in this section. The Applicant has incorporated the
14 following APMs (including BLM BMPs are included) to avoid and minimize impacts on the geology,
15 soils, and mineral resources of the Proposed Project area:

- 16 • APM-1 Erosion Control
- 17 • APM-2 Excavation/Grading
- 18 • APM-3 Air/Dust Control
- 19 • APM-4 Stormwater Pollution Prevention (SWPP) Plan
- 20 • APM-5 Spill Prevention and Countermeasures Control (SPCC) Plan
- 21 • APM-6 Health and Safety Program
- 22 • APM-7 Emergency Response Plan
- 23 • APM-8 Waste Management Plan
- 24 • APM-9 Weed Control Plan
- 25 • APM-10 Site Rehabilitation Plan and Facility Decommissioning Plan

26 For construction of Western’s proposed switching station, Western will require the construction
27 contractor to incorporate specific provisions to mitigate impacts related to geology and soils resources in
28 Western’s Environmental Construction Standard 13, specifically the following sections:

- 29 • 13.3 Landscape Preservation
- 30 • 13.4 Noxious Weed Control

31 **Landslides, Lateral Spreading, Subsidence, Liquefaction, or Collapse**

32 Construction. The Proposed Project site is located primarily on hills underlain by volcanic, igneous, and
33 metamorphic rock. The southern portion of the project site is located on gently sloping alluvial deposits
34 that are composed of sediments derived from adjacent upland areas. The areas of the development that are
35 underlain by volcanic, igneous, and metamorphic rock have a low potential for erosion and landslides,
36 and because of the strength and characteristics of bedrock materials, are not subject to liquefaction, lateral
37 spreading, subsidence, or collapse. The potential for liquefaction and lateral spreading in the area
38 underlain by alluvial deposits is low. There might be a moderate potential for subsidence or collapse of
39 alluvial deposits during seismic shaking.

40 Grading for access roads and WTG construction pads would create cut-and-fill slopes in areas underlain
41 by bedrock materials. There is a potential for a short- and long-term increase in landslides in cut-and-fill
42 slopes.

1 **Geologic Features and Hazards**

2 Construction. Under this alternative, 249 acres would be temporarily disturbed and 160 acres would be
3 permanently disturbed. In total, earth grading and excavation for 96 WTG sites, laydown areas,
4 substations, and O&M facilities would encompass 409 acres of disturbance. This total includes the
5 construction of 29 miles of new road and the widening of 9 miles of existing road (to either 16 or 36 feet).

6 The Proposed Action would result in alteration of the existing topography to create access roads, WTG
7 foundations, and building pads. The altered topography would remain throughout the lifetime of the
8 Proposed Project, but would be restored during decommissioning of the facility. The geology of the
9 proposed grading area does not contain unique geologic features; therefore, impacts to geological or
10 topographical features would be short-term and restored with the implementation of appropriate APMs.
11 No permanent impacts are anticipated.

12 Similar to the effects described above, construction of Western's proposed switching station would result
13 in the alteration of existing topography (7 acres). The geology of the proposed grading area does not
14 contain unique geologic features; therefore, impacts to geological or topographical features would be
15 short-term. Potential impacts to soils and geologic features at the Western switching station site, located
16 on alluvial deposits, will be mitigated by Western requiring the construction contractor to comply with
17 Western's Environmental Construction Standard 13. Western proposes to reclaim approximately one half
18 of the area of soil disturbed (2.5 acres) after construction.

19 O&M and Decommissioning. Project components, including WTGs, substations, interconnect facilities
20 and the Western switching station could be damaged by potential geologic hazards, including seismic
21 ground shaking, seismic ground failure, settlement, and landslides. A safety zone would be established
22 around each WTG location for protection of the public from failure of the WTGs as a result of mechanical
23 failure or geologic hazard, such as seismic shaking and ground failure. Substations and Western's
24 proposed switching station facilities would be fenced and secured to prevent public access and limit
25 potential hazards to the public. Implementation of appropriate APMs and Western's Construction
26 Standard 13 would reduce potential short- or long-term adverse effects related to damage by geologic
27 hazards, and ensure that any damage that does occur would be short term and localized. Western
28 proposes to limit access by construction of a fence to secure the switching station from public access.

29 **Soils**

30 Construction. Under the Proposed Action, approximately 409 acres of soil would be disturbed, mixed
31 structurally, compacted, and exposed to erosion during construction. This represents approximately 2% of
32 the total ROW boundary area. Approximately 160 acres would remain permanently impacted by project
33 components (access roads, WTGs, crane pads, and overhead poles). This represents approximately 0.8%
34 of the total ROW boundary area. The construction of roads and WTGs would affect soils by mechanically
35 breaking down the soil structure, which would increase the erosion potential. This might result in a
36 temporary increase in erosion and windblown dust on up to 409 acres until construction is completed.
37 Following construction, 249 acres would be reclaimed. This represents approximately 1.2% of the total
38 ROW boundary area. Impacts on soils would indirectly affect vegetation and the ability to revegetate after
39 construction (see Biological Resources Section 4.4 for additional impact related to vegetation).

40 The primary impacts on soils associated with the Proposed Project are tied to the area of surface
41 disturbance identified for each alternative. Although the type of surface disturbance would be similar for
42 each WTG location and roadway, the impacts would be dependent on the number of acres of associated
43 soil disturbance, as well as the number and distribution of WTGs and roadways proposed. These impacts
44 would be mitigated through the implementation of APMs 1-5 and APM-9. Following construction, areas
45 not maintained as permanent facilities would be reclaimed to their prior land use. The increased potential
46 for soil erosion would remain throughout the lifetime of the Proposed Project but would be minimized by

1 removal of WTGs, by regrading of roads and WTG sites, and through revegetation of the impacted areas
2 during decommissioning of the facility (APM-10)

3 The proposed action could increase the potential of exposure to contaminated soils. According to the
4 NDEP Bureau of Corrective Actions online site list, no hazardous waste facilities subject to corrective
5 action are located on the project site (NDEP 2011). Additionally, results of an Environmental
6 FirstSearch™ Report prepared on August 3, 2011, showed that the project site was not located in any of
7 the referenced environmental databases and that no properties of environmental concern were located
8 within 1 mile of the site (FirstSearch 2011). A Phase 1 Environmental Site Assessment is currently being
9 prepared and will be completed for the Proposed Project. Because the project site includes areas that have
10 been historically mined, there remains a potential for the presence of contaminated soils. The Applicant
11 and Western would incorporate procedures into the site grading plan to include notification of a BLM-
12 approved environmental professional (such as a Nevada-Certified Environmental Manager or
13 Environmental Engineer) if suspect contaminated soil is encountered (soil with observable stains or
14 odors). The potential for contaminated soils exposure will be mitigated by immediately terminating
15 grading operations where suspect contaminated soils are encountered, notifying the BLM, and proposing
16 to implement remedial actions proposed by the environmental professional (APMs 1 and 2, and APMs 7–
17 9).

18 Impacts on soils from construction of Western's proposed switching station would be similar as those
19 described for the Proposed Action, although 7 acres would be disturbed. Western proposes to minimize
20 short and long term erosion by graveling the fenced area and the access road for Western's proposed
21 switching station and reclaiming approximately half of the disturbed soil area by revegetation.

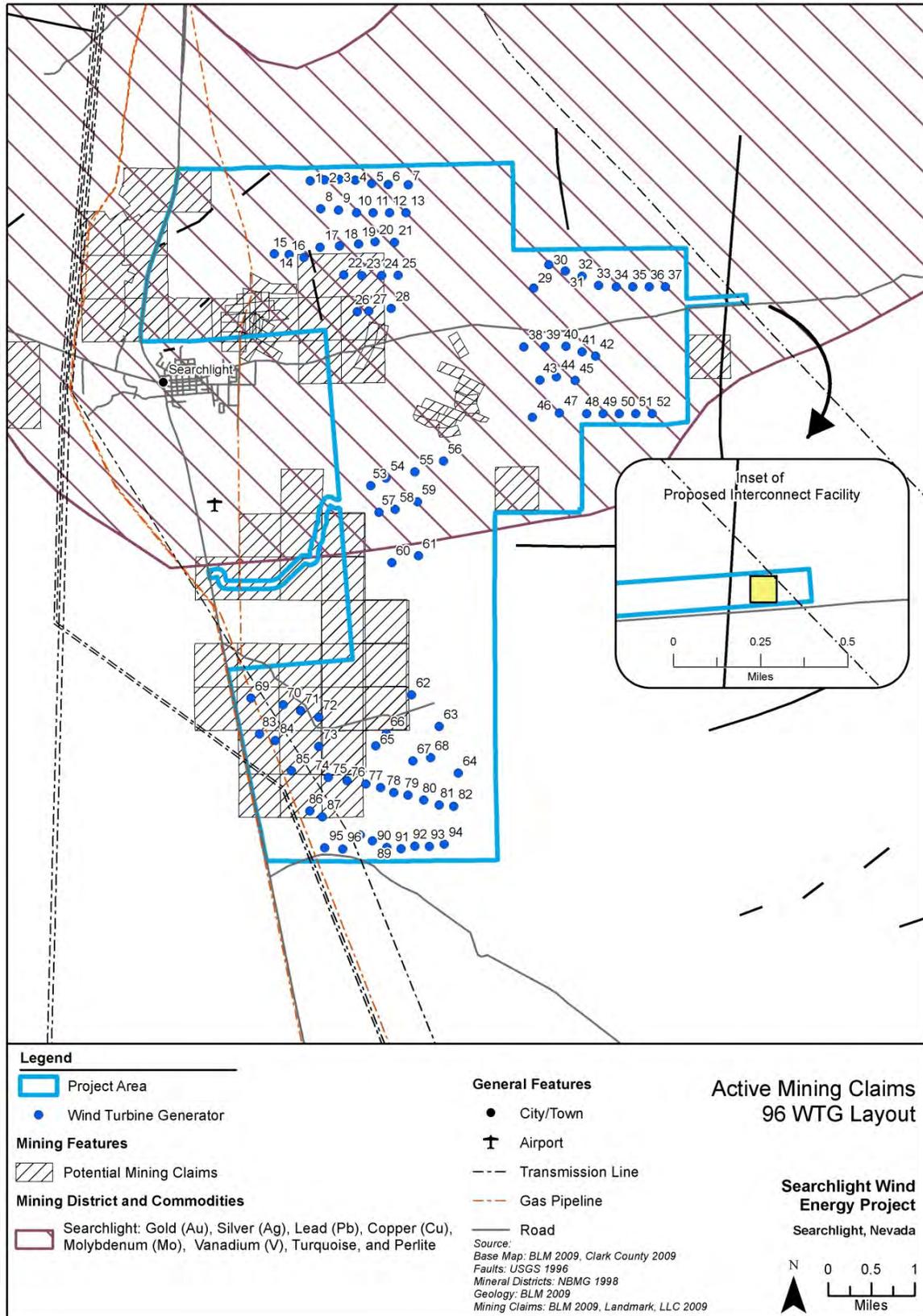
22 Minerals

23 Potentially, the proposed project could affect existing unpatented mining claims. Under the Proposed
24 Action, the following 18 WTGs might be located on unpatented mining claims (Figure 4.1-1).

- 25 • WTGs 22, 23, 24, 26 and 27, proposed to be located east of Searchlight, and
- 26 • WTGs 69, 70, 71, 72, 73, 74, 75, 76, 83, 84, 85, 86, and 87, proposed to be located south of
27 Searchlight.

28 These 18 WTGs represent approximately 16% of the proposed total 96 WTG layout.

29 The Proposed Action would have a potential long-term impact on an unknown number of existing
30 unpatented mining claims by permanently removing locatable mineral exploration and appropriation
31 acreage underneath some of the proposed WTG foundations and any set-backs to the foundations
32 necessary for their structural stability (structural set-back). The 96 WTG Layout Alternative would
33 exclude about 8 acres from mineral prospecting and development from underneath the WTGs and the
34 estimated structural set-back.



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2 **Figure 4.1-1. Mining Claims Potentially Affected by 96 WTG Layout Alternative**

1 In addition, under the 96 WTG Layout Alternative, there might be a potential long-term impact on an
2 unknown number of existing unpatented mining claims by removing locatable mineral exploration and
3 appropriation of acreage underneath a safety set-back area (which may be deemed necessary to protect
4 mining claim holders working on their claims from potential injury from a WTG blade throw hazard).
5 The Proposed Action might require a blade throw safety set-back onto about 849 acres covered by
6 unpatented mining claims.

7 There might be a potential for long-term impacts on an unknown number of existing unpatented mining
8 claims by removing locatable mineral exploration and appropriation of acreage beneath Western's
9 proposed switching station during the lifetime of the proposed action. Following decommissioning and
10 removal of the Switching Station, access for potential mining would be restored.

11 Additionally, the Proposed Project may restrict access to locatable mineral exploration and appropriation
12 acreage or, alternatively, locatable mineral resources may permanently be removed within the proposed
13 project area. Locatable resources available near the Proposed Project site were identified by compiling
14 data from the BLM's Land & Mineral Legacy Rehost 2000 System-LR2000. There are 561 active and
15 1,827 closed mining claims within the Proposed Project area (see Figure 3.1-3). The project area includes
16 part of the historic Searchlight mining district, which has produced millions of dollars in gold, silver,
17 copper, and lead since 1897 (Ludington et al. 2006). There is potential for undiscovered gold deposits
18 within the Searchlight mining district (Ludington et al. 2006).

19 Locatable lode and placer mineral deposits in the Proposed Project area are under claim as valuable
20 deposits subject to exploration and development, as determined by the General Mining Law of 1872 and
21 its amendments. Mineral deposits are located either by lode or placer claims (43 CFR 3832). The 1872
22 Mining Law requires a lode claim for "veins or lodes of quartz or other rock in place" (30 USC 26) and a
23 placer claim for all "forms of deposit, excepting veins of quartz or other rock in place" (30 USC 35). The
24 project area also has mill site claims that are located to occupy non-mineral land for use in milling or
25 processing of mined materials (43 CFR 3832). The project area also has patented lode and millsite mining
26 claims. A patented mining claimholder receives clear title to the claim area, making the claim area private
27 land (30 USC 29-38, 42, 43 USC 661).

28 According to federal law (30 USC 612), the purpose of an unpatented mining claim is for mineral
29 prospecting, mining or processing operations, and other reasonable mining-related uses. Unpatented
30 mining claims remain public land under multiple-use management, as defined by the BLM. Specifically,
31 permanent project components and their required safety set-back may limit future access to and use of
32 portions of existing unpatented mining claims. Lode mining claims also provide for extralateral rights to
33 any lodes, veins, or other minerals whose apex or top lies within the area of the claim (30 USC 26). These
34 extralateral rights allow the locator to follow any vein or lode that has its top within the claim area
35 downward and beyond the side boundary line of the claim for an unspecified distance. There are many
36 legal complications to lode claim extralateral rights. A mining claim holder has the right to prevent others
37 from prospecting and mining on his or her claim but cannot prevent others from crossing his or her claim
38 for uses recognized under the Multiple Surface Use Act of 1955 (30 USC 611-615).

39 The BLM's Land & Mineral Legacy Rehost 2000 System-LR2000 BLM Geographic Index to Mining
40 Claims was searched to assess the proximity of unpatented lode, placer, and mill site claims to the
41 proposed WTG locations, access roads, and electrical interconnect lines. The mining claims shown on
42 Figure 3.1-3 are the approximate areas covered by claims. The precise location of the unpatented mining
43 claims listed in the Geographic Index cannot be determined by a review of that index alone. The
44 Geographic Index only shows that a recorded mining claim lies within a given quarter section (160 acres).
45 To evaluate the location of the unpatented claim within the quarter section, the map that accompanied the
46 Notice of Location must be reviewed. These maps are available for review in the Nevada State Office.

47 Generally, the long axis of a lode claim should be along and parallel to the mineral vein or lode, and the
48 claim should extend 300 feet on both sides of the centerline of the vein or lode. The location monument

1 can be placed anywhere along the centerline of the claim, but for convenience it is often placed near one
2 end of the claim (30 USC 23).

3 As nearly as practical, a placer claim must conform to the system of public land surveys, which means it
4 should conform to the boundaries of a section and should describe a legal subdivision of the section,
5 typically to the quarter-section. The placer claim boundaries should be oriented north-south and east-west
6 if possible. An individual can locate 20 acres per placer claim, and groups (e.g., associations, companies,
7 etc.) can locate placer claims up to 160 acres in size (30 USC 35; 43 CFR 3832.22). For a placer claim,
8 Nevada State law requires that a monument similar to those used for a lode claim be established at any
9 point along the north boundary of the placer claim (NRS 517.030). There are no unpatented mining
10 claims in the project area that predate the Multiple Surface Use Act.

11 There is a potential for long-term impacts to mining by removing potential locatable mineral exploration
12 and appropriation of acreage beneath Western's proposed switching station during the lifetime of the
13 proposed action. Following decommissioning and removal of the Switching Station access for potential
14 mining would be restored. Currently, no mining claims are located near the switching station; therefore,
15 no impacts to existing mining claims are anticipated.

16 Also the Proposed Project may restrict access to availability of saleable mineral resources within the
17 project area. Saleable resources available near the Proposed Project site and Western's proposed
18 switching station were identified by compiling data from USGS (2005a). Sand, gravel, and stone have
19 been extracted or processed at locations in the vicinity of the Proposed Project site. However, because
20 none of these locations fall within the Proposed Project site, the Proposed Action, and Western's
21 proposed Federal Action, would have no effect on saleable mineral resources.

22 The Proposed Project may restrict access or the availability of fluid leasable mineral resources within the
23 project area. Oil and gas resources in the region were identified using data produced by the Nevada
24 Bureau of Mines and Geology. There are no oil or gas producers or seeps in the vicinity of the Proposed
25 Project site. The Proposed Project area is considered to have a low potential for the occurrence of fluid
26 minerals and non-energy leasable minerals, as defined by the BLM (1998). Impacts on these resources
27 from the Proposed Action are not anticipated. Exploration for fluid minerals would not be precluded by
28 project components, even though fluid minerals are unknown within the area around the project site
29 (Garside and Hess 2007). The Proposed Project site is in a geothermal resource area with maximum
30 geothermometer temperatures of less than 100 degrees (°) Centigrade; therefore, the Proposed Project site
31 is in an area of lower regional geothermal potential and is considered less favorable than other areas in
32 Nevada for hosting high-temperature geothermal systems (Zehner et al. 2009). Proposed Project
33 components would not limit exploration technologies used to assess fluid mineral and geothermal
34 resources.

35 **4.1.2.3 87 WTG Layout Alternative**

36 Effects to geology and soils under the 87 WTG Layout Alternative would be similar to those identified
37 under the Proposed Action. Approximately 352 acres of would be disturbed during construction. This
38 represents approximately 1.8% of the total ROW boundary area. Approximately 152 acres would remain
39 permanently affected by project components (access roads, WTG foundations, crane pads, and overhead
40 poles). This represents approximately 0.8% of the total ROW boundary area. Effects for construction
41 would be less under this alternative compared to the Proposed Action, but the type, intensity, and duration
42 of the effects would be similar.

43 Regarding existing unpatented mining claims, the effects of the 87 WTG Layout is similar however the
44 WTG's that could potentially affect mining claims differ. The 87 WTG Alternative would also have 15
45 wind WTGs with safety set-backs including areas covered by mining claims (Figure 3.1-3). This would
46 exclude about 8 acres from mineral prospecting and development from underneath the WTG foundation

1 and the estimated structural set-back, and might require a blade throw safety set-back onto about 849
2 acres covered by unpatented mining claims.

3 Under this alternative, the following 18 WTGs might be located on unpatented mining claims (Figure 4.1-
4 2).

- 5 • WTGs 20, 21, 22, 24 and 25, proposed to be located east of Searchlight, and
- 6 • WTGs 60, 61, 62, 63, 64, 65, 66, 67, 74, 75, 76, 77, and 78, proposed to be located south of
7 Searchlight.

8 These 18 WTGs represent approximately 18% of the proposed total 87 WTG layout.

9 **4.1.3 Mitigation Measures**

10 To further reduce effects to geology, soils, and minerals, the Applicant will adhere to the following
11 mitigation measures:

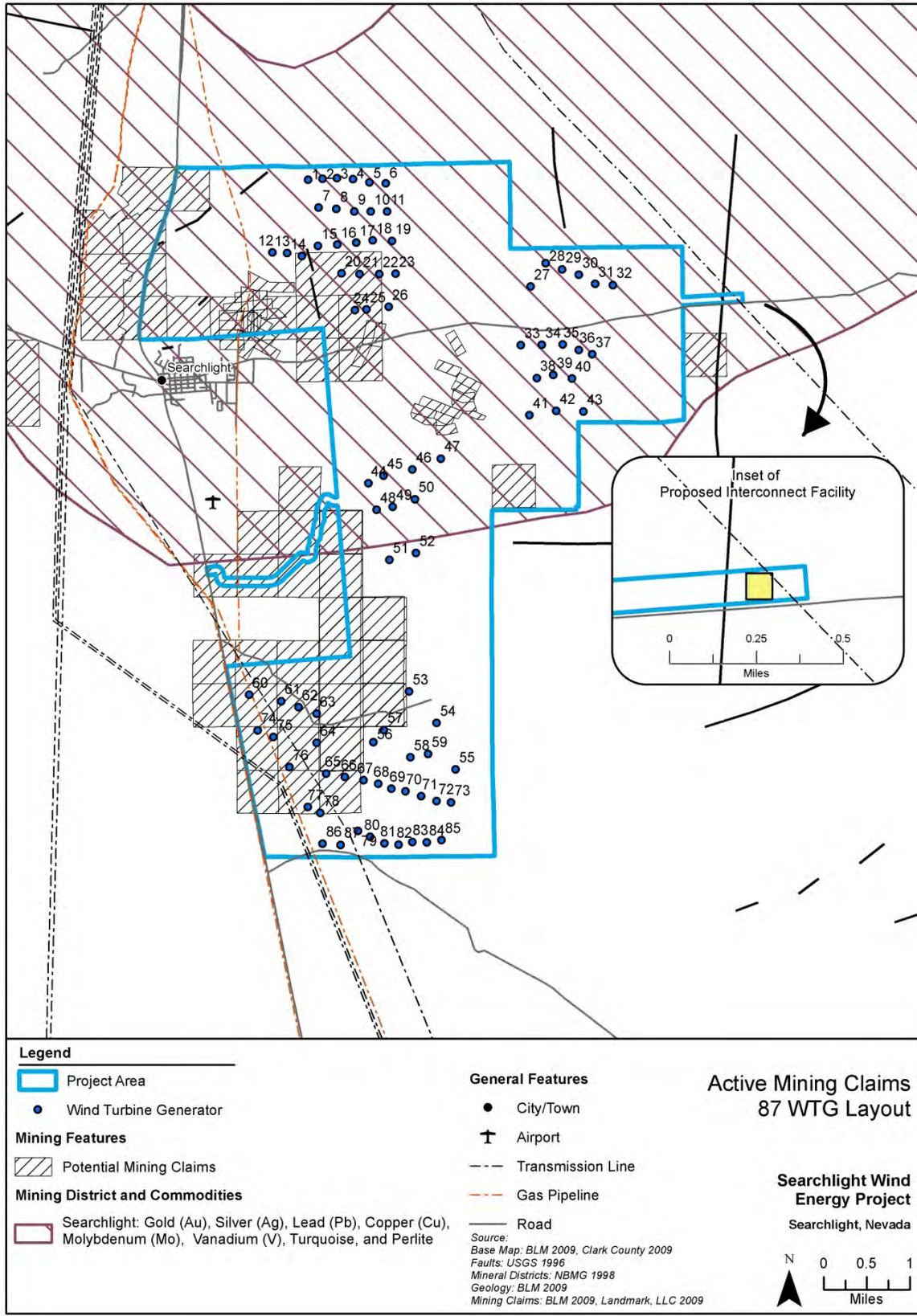
12 MM GEO-1: Engineering Design and Implementation. To minimize or avoid the hazard of landslides
13 in cut-and-fill slopes, or settlement of fill materials, the Applicant will conduct BLM-approved
14 geotechnical engineering and geologic design studies to assess the stability of planned cut-and-fill slopes.
15 This will include geotechnical observations and materials testing of the compaction and placement of fill
16 materials for roads and WTG pads. The Applicant would document that the grading and earthwork were
17 in accordance with the engineering design specifications.

18 MM GEO-2: Inspections after Geologic Events. To minimize or avoid potential hazards from
19 earthquakes and other geologic events, the Applicant will have inspections performed by a BLM-
20 approved appropriate professional (e.g., geologist, geologic engineer, geotechnical engineer, or structural
21 engineer) following geologic events in the vicinity of the Proposed Project site. The appropriate
22 professional will perform the appropriate inspection and make recommendations to see that hazards are
23 minimized for the next comparable or larger event. The Applicant will implement the recommended
24 corrective actions.

25 MM GEO-3: Applicant's Insurance Coverage. The Applicant shall acquire the appropriate insurance
26 coverage to address potential offsite damage to structures or injury to people by facility structures that are
27 moved offsite by a geologic event such as an earthquake, windstorm, or flash flood event.

28 **4.1.4 Residual Effects**

29 The short-term, localized impacts on geology, soils, or minerals during the lifetime of the Proposed
30 Project and Western's proposed switching station would be minimized during decommissioning of the
31 facility, so there would be no residual impacts from the Proposed Project.



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2 **Figure 4.1-2. Mining Claims Potentially Affected by 87 WTG Layout Alternative**

1 **4.2 Paleontological Resources Impacts**

2 This section discusses effects on paleontological resources that may occur with implementation of the
3 Proposed Action and alternatives.

4 **4.2.1 Indicators**

5 NEPA requires that important natural attributes of our national heritage are considered when assessing the
6 environmental consequences of any Proposed Action and alternatives. NEPA does not refer to
7 paleontological resources specifically; however, NEPA Section 101(b)(4) states that it is the
8 responsibility of the federal government to “preserve important historic, cultural, and natural aspects of
9 our national heritage, and maintain, wherever possible, an environment which supports diversity, and
10 variety of individual choice.” NEPA does not provide impact indicators specifically for paleontological
11 resources. However, it is the policy of the BLM that potential effects on scientifically significant
12 paleontological resources be identified and proper mitigation is implemented (BLM 2007b). Pursuant to
13 BLM policy, the Proposed Project would adversely affect paleontological resources if it:

- 14 • Damages or destroys known paleontological resources; or
- 15 • Causes the loss of valuable scientific information by disturbing the geology in which fossils are
16 found.

17 **4.2.2 Direct and Indirect Effects by Alternative**

18 This section describes the effects under each alternative using the respective methodology prescribed
19 under NEPA.

20 **4.2.2.1 No Action**

21 Under the No Action Alternative, the ROW application would be denied and the Proposed Project would
22 not be built; therefore, no project related effects on paleontological resources would occur.

23 **4.2.2.2 Proposed Action - 96 WTG Layout Alternative**

24 Under the Proposed Action, the BLM would authorize the Applicant to construct, operate and maintain,
25 and decommission a 200-megawatt (MW) wind energy facility on BLM-administered lands. For the
26 purposes of analyzing impacts on paleontological resources, the Area of Potential Effect for the Proposed
27 Action encompasses approximately 249 acres of temporarily disturbed lands and approximately 160 acres
28 of permanently disturbed lands. In addition, a total of 37.6 miles of road construction and road
29 improvements, two substations, one O&M building, and 8.7 miles of overhead transmission lines would
30 be built.

31 The Proposed Action could result in destruction of or disturbance to buried or unknown paleontological
32 resources. As discussed in Section 3.2.1, Paleontological Resources, the results of the paleontology
33 literature and records review for the Proposed Action indicate that the majority of the project area has a
34 low potential to affect significant nonrenewable fossil resources because the Quaternary alluvium and
35 Tertiary volcanic rock formations in the project area fall into BLM Classes 1 and 2 (BLM 2007b:
36 Attachment 1-1). Results of the data inventory and impact assessment confirm that no paleontological
37 resources have been previously recorded in the project area, and that the sediments present within the
38 boundaries of the project area have a very low to low potential to contain significant paleontological
39 resources. The BLM has determined that in such geologic units, no additional paleontology assessment is
40 necessary (BLM 2008c).

41 Additionally under the Proposed Action, the BLM would authorize Western to construct, operate, and
42 maintain the proposed switching station. Effects of the switching station would be similar to those
43 described above. Western would minimize effects to paleontological resources by implementing

1 Construction Standard 13, specifically section 13.4 Preservation of Cultural and Paleontological
2 Resources.

3 **4.2.2.3 87 WTG Layout Alternative**

4 The 87 WTG Layout Alternative would be constructed, operated and maintained, and decommissioned
5 similarly to the 87 WTG Layout Alternative except that 87 WTG Layout Alternative would consist of 9
6 less WTGs within the project site. Facilities associated with the 87 WTG Layout Alternative would be
7 located over a total of approximately 230 acres of temporarily disturbed lands. Following the reclamation
8 of temporary laydown areas, construction roadway widths, and WTG assembly areas, approximately 152
9 acres would be permanently disturbed. In addition, 35.9 miles of road construction and road
10 improvements, two substations, one O&M building, and 8.7 miles of transmission lines would be built.

11 The type, intensity, and duration of effects on paleontological resources would be similar to that of the 96
12 WTG Layout Alternative, and the project design features and mitigation would be the same for both the
13 Action Alternatives.

14 **4.2.3 Mitigation**

15 While results of the data inventory and impact assessment confirm that the sediments present within the
16 boundaries of the Proposed Project area have a low potential to contain significant paleontological
17 resources, if significant subsurface paleontological resources are identified during construction, the BLM
18 requires the following mitigation:

19 MM PALEO-1: Paleontological Mitigation. The Applicant will immediately notify the BLM authorized
20 officer of any paleontological resources discovered as a result of operations under this authorization. The
21 Applicant will suspend all activities in the vicinity of such discovery until notified to proceed by the
22 authorized officer, and will protect the locality from damage or looting. The authorized officer will
23 evaluate, or will have evaluated, such discoveries as soon as possible, but not later than five working days
24 after being notified. Appropriate measures to mitigate adverse effects on significant paleontological
25 resources will be determined by the authorized officer after consulting with the Applicant. The Applicant
26 is responsible for the cost of any investigation necessary for the evaluation and for any mitigation
27 measures, including museum curation. The Applicant may not be required to suspend operations if
28 activities can avoid further impacts on a discovered locality or be continued elsewhere (BLM 2008c:
29 Attachment 1-4).

30 **4.2.4 Residual Effects**

31 No residual effects on paleontological resources would result from implementation of the No Action or
32 action alternatives.

1 **4.3 Water Resources Impacts**

2 This section discusses impacts on water resources that may occur with implementation of the Proposed
3 Action or alternatives. Information on existing water resource conditions from Section 3.3 of this DEIS
4 was used as the baseline by which to measure and identify potential impacts by alternative.

5 **4.3.1 Indicators**

6 The Proposed Action would affect water resources if it:

- 7 • Decreases groundwater supply, interfere with groundwater recharge, or degrade the quality of
8 groundwater such that it is no longer suitable for its intended use;
- 9 • Degrades water quality in down gradient washes and other surface waters beyond applicable
10 surface water quality standards, such as through increased erosion and/or sedimentation;
- 11 • Alters projected frequency, extent, and duration of flooding from surface water runoff beyond
12 applicable surface water quality standards;
- 13 • Degrades an existing surface water feature that meets the definition of a Water of the United
14 States and not in compliance with a Section 404 permit issued by the USACE under the Clean
15 Water Act;
- 16 • Increases the potential for flood hazards; or
- 17 • Changes existing water rights.

18 **4.3.2 Direct and Indirect Effects by Alternative**

19 This section describes the effects under each alternative using the respective methodology prescribed
20 under NEPA. To compare effects, this analysis defines the temporal scale (time), spatial extent (area), and
21 intensity of effects for each alternative.

22 **4.3.2.1 No Action Alternative**

23 Under the No Action Alternative, the ROW applications would be denied and the Proposed Project and
24 Western's proposed switching station would not be built; therefore, no project related effects on water
25 resources would occur.

26 **4.3.2.2 Proposed Action – 96 WTG Layout Alternative**

27 Under the 96 WTG Layout Alternative, the BLM would approve the ROW applications and the Proposed
28 Action and Western's proposed switching station would be carried forward. Effects that could result from
29 the implementation of Proposed Action and Western's switching station during construction, O&M, or
30 decommissioning activities are analyzed in this section. The Applicant has incorporated the following
31 measures (see Table 2.6) to avoid and minimize impacts on the water resources of the Proposed Project
32 area:

- 33 • APM-1 Erosion Control
- 34 • APM-2 Excavation/Grading
- 35 • APM-3 Air/Dust Control
- 36 • APM-4 Stormwater Pollution Prevention Plant (SWPPP)
- 37 • APM-5 SPCCP
- 38 • APM-6 Health and Safety Program
- 39 • APM-7 Emergency Response Plan
- 40 • APM-8 Waste Management Plan

- 1 • APM-9 Weed Control Plan
- 2 • APM-10 Site Rehabilitation Plan and Facility Decommissioning Plan
- 3 • APM-15 General Design and Construction Standards

4 For construction of the Westerns proposed switching station, Western will require the construction
5 contractor to incorporate specific provisions of Western’s Environmental Construction Standard 13 for
6 mitigating impacts to water resources, specifically the following sections:

- 7 • 13.3 Landscape Preservation
- 8 • 13.5 Weed Control Plan
- 9 • 13.8 Disposal of Waste Material
- 10 • 13.10 Pollutant Spill Prevention, Notification, and Cleanup
- 11 • 13.16 Prevention of Water Pollution

12 **Groundwater Usage**

13 Minor impacts on groundwater would occur under the Proposed Action for construction, O&M, and
14 decommissioning activities. Water for the Proposed Project and would be obtained from the existing
15 SWS, which is supplied by two supply wells, or another existing water right in the Searchlight area.
16 Water would be transported to the Proposed Project site and stored in an approximately 4,000-gallon
17 aboveground water storage tank. No wells would be drilled or springs developed for use by the Proposed
18 Project.

19 Construction. The construction phase would account for the majority of water use under the Proposed
20 Action including construction of Western’s proposed switching station, with a water supply required for
21 the concrete batch plant operations, road maintenance, dust suppression, and worker use. The concrete
22 batch plant is expected to use approximately 1.5 acre-feet of water to make approximately 40,000 cubic
23 yards of concrete for construction of WTG foundations, substations, and the O&M building. This is based
24 on the estimated use of approximately 4,000 gallons of water per day over a period of about 5 months.
25 Dust suppression and road maintenance activities would use approximately 30 acre-feet of water during
26 the planned 8- to 12-month construction phase of the Proposed Action. Exact estimates for water usage
27 were not available when this DEIS was prepared; however, these estimates for construction-phase water
28 use are based on similar renewable energy projects in the western U.S. In addition, temporary portable
29 toilets would be provided during the construction phase. Due to the relatively small construction footprint
30 of the Proposed Action in comparison to the area of the project watersheds, construction of the Proposed
31 Project would not impact groundwater recharge in the Proposed Project area.

32 O&M and Decommissioning. During the O&M phase of the Proposed Project, approximately 15 full-time
33 workers are expected to be onsite for day-to-day O&M activities. The ongoing water usage for drinking
34 water and restroom facilities is estimated to be approximately 0.15 acre-feet per year. Drinking water
35 would be supplied from the existing SWS. Water for toilets and drinking would be stored in a storage
36 tank at the O&M facility. Due to the small permanent footprint of the Proposed Project in comparison to
37 the area of the project watersheds, the O&M of the Proposed Project would not impact groundwater
38 recharge in the project area.

39 Waste water from toilet flushing at the O&M building would be treated on site with an onsite septic tank
40 and absorption field. The Applicant would apply for a Small Commercial Septic System Permit from the
41 Clark County Health District. The septic tank and absorption field would be located adjacent to the O&M
42 building. Exact estimates for water usage during O&M were not available when the DEIS was prepared;
43 however, these estimates for O&M water use are based on similar renewable energy projects in the
44 western U.S.

45 Decommissioning of the Proposed Project would include the removal and disposal of WTG towers,
46 above-ground electrical tower components, substation components, and O&M facilities, as well as the

1 removal of below-ground infrastructure to 3 feet below the ground surface. No water requirements
2 associated with decommissioning the Proposed Project have been identified at this time. However, based
3 on the description of decommissioning activities provided in Section 2.3.7, Decommissioning, it is
4 reasonably anticipated that approximately the same amount of water used for construction (approximately
5 30 acre feet) would be required for soil conditioning and dust control during decommissioning, which
6 would involve some earth-disturbing activities. Decommissioning activities will include, but are not
7 limited to, removal of concrete foundations, backfilling of foundation holes, and restoration of natural
8 grade. A water source for decommissioning has not been identified; however, the same water source used
9 during construction and O&M would likely be used to meet decommissioning requirements. The septic
10 system would be abandoned in a manner consistent with state and local health regulations.

11 **Groundwater Quality**

12 Construction. Potentially, spills of chemicals and petroleum products can degrade groundwater quality
13 such that it is no longer suitable for its intended use. The Proposed Project would use small amounts of
14 hazardous materials during construction (see Section 3.14, Human Health and Safety). Petroleum spills
15 would be possible while refueling equipment during construction and O&M of the Proposed Project.

16 As described in Section 3.3.4, Groundwater Resources, the static groundwater depths in those wells
17 located in the project vicinity range from approximately 170 feet to over 270 feet below ground surface.
18 The Applicant has also stated that an Emergency Response Plan (APM-7) would be developed to address
19 emergencies, including leaks and spills during construction, and a Waste Management Plan (APM-8) to
20 manage the storage, transportation, and handling of wastes. Successful implementation of the APMs
21 listed above would minimize the potential for a spill and detail the measures to cleanup any spills that
22 occur. In addition, groundwater is located over 100 feet below the ground surface; therefore, it is unlikely
23 that any surface spill would infiltrate to groundwater. Potential impacts related to water impacts at
24 Western's proposed switching station site, located on alluvial deposits, will be mitigated by Western
25 requiring the construction contractor to comply with Western's Environmental Construction Standard 13.

26 O&M. Additionally, O&M of the Proposed Project would require the use of small amounts of hazardous
27 materials; therefore, potential effects for O&M and mitigation would be the same as those described
28 above. Additionally, the Applicant has stated that a SPCCP (APM-5) would be developed and
29 implemented to protect the environment from petroleum product and hazardous material spills during
30 operation.

31 Other sources of liquid waste with the potential for contamination would come from sanitary waste from
32 the onsite septic tank and drainfield system that would be constructed near the O&M building to
33 accommodate O&M-phase sanitary waste. The septic system would be constructed and maintained in
34 accordance with state and local regulations.

35 **Surface Water Quality**

36 Surface water quality potentially can be degraded by increasing rates of erosion and sedimentation,
37 introducing contaminants, violating water quality standards, or otherwise changing the character of
38 surface waters. As described in Section 3.3, the Proposed Project area would be spread across portions of
39 two Hydrographic Flow Regions; the Central Region and the Colorado River Basin Region, both of
40 which are a part of the greater Colorado Regional Flow System (Harrill et al. 1988). The administrative
41 hydrographic basins, or sub-basins, in which the Proposed Project area is located include the Central Flow
42 System's Eldorado Valley to the north; Piute Valley to the west, and Colorado River Valley to the east,
43 all part of the Colorado River Basin. There are no perennial water bodies within the Proposed Project
44 area. Therefore, there are no surface water quality data available against which to measure potential
45 impacts.

1 Construction. Under the Proposed Action, the total construction impact area for all project features would
2 be 409 acres. Following the reclamation of 249 acres of construction impacts areas, the total acreage with
3 permanently disturbed ground surfaces potentially opened to wind erosion as a result of this project would
4 be approximately 160 acres under the Proposed Action.

5 Construction activities would result in the disturbance of soils, which could activate increased sediment
6 transport in shallow unnamed ephemeral desert washes that pass through the site. Temporary impacts
7 resulting from sediment uptake in stormwater would be mitigated using BMPs and APMs 1 and 4 for
8 erosion containment to protect water quality. Permanent impacts from sediment uptake would be
9 mitigated through facility design parameters, including stormwater-control and erosion-control structures
10 in accordance with CCDAQEM and the State of Nevada’s stormwater permits.

11 Changes to the site surface, including devegetation and gullyng, would likely result in increased erosion
12 and sedimentation both on and off site for the life of the project. The Applicant has proposed to
13 incorporate the construction-phase erosion and sediment control measures listed in the
14 Excavation/Grading Plan (APM-2), the Air/Dust Control Plan (APM-3), and the Applicant’s SWPPP
15 (APM-4). These measures are consistent with regional BMPs and federal, state, and local regulations.
16 These measures would control erosion and sediment transport during construction. These plans must be
17 approved by the BLM three months prior to the beginning of project. Potential impacts related to water
18 impacts at Western’s proposed switching station site will be mitigated by Western requiring the
19 construction contractor to comply with Western’s Environmental Construction Standard 13.

20 Using heavy equipment and trucks for construction activities carries some risk of an accidental fuel,
21 chemical, or other hazardous material spill. Small amounts of general chemical solvents, herbicides,
22 paints, and petroleum products would be used during construction of the Proposed Project. In addition,
23 large quantities of mineral oils in transformers and hydraulic fluids and lubricating oils for WTG
24 construction would be stored on site during the construction phase. The greatest potential for
25 contamination of surface water from these materials would be from petroleum products, including diesel
26 fuel stored on site for fueling equipment and in a 500-gallon aboveground storage tank for the concrete
27 batch plant; petroleum products contained within transformer and other electrical equipment; and
28 petroleum products contained within heavy equipment traversing the project area. The Applicant’s
29 Emergency Response Plan (APM-7) and SPCC Plan (APM-5) would provide for hazardous material spill
30 prevention and clean-up measures, were a spill to occur. Potential impacts related to water at Western’s
31 proposed switching station site will be mitigated by Western requiring the construction contractor to
32 comply with Western’s Environmental Construction Standard 13.

33 O&M and Decommissioning. There would likely be effects that last beyond the construction period and
34 terms of the General Permit and SWPPP. Although the Applicant and Western plan to maintain existing
35 drainage patterns throughout the Proposed Project area, construction and O&M of the Proposed Project
36 activities would likely change natural runoff patterns, thereby affecting erosion and deposition. O&M and
37 decommissioning activities causing ground disturbance, such as grading and devegetation, and
38 installation and operation of the Proposed Project components, could have long-term effects, increasing
39 the amount of soil erosion in and downstream of the project area. These potential long-term effects are not
40 completely understood at this time because the amount of revegetation that would occur is in a
41 development phase. However, permanent impacts from sediment uptake would be mitigated through
42 facility design parameters, including stormwater-control and erosion-control structures and incorporation
43 of BMPs in accordance with the State of Nevada’s stormwater permits, and the Applicant’s Site
44 Rehabilitation Plan (APM-10). Potential impacts related to water at Western’s proposed switching station
45 site will be mitigated by Western requiring the construction contractor to comply with Western’s
46 Environmental Construction Standard 13.

47 The Applicant has proposed to incorporate O&M-phase erosion and sediment control measures listed in
48 the Air/Dust Control Plan (APM-3), SWPPP (APM-4), and Site Rehabilitation Plan (APM-10). These

1 measures are consistent with regional BMPs and federal, state, and local regulations, and would control
2 erosion and sediment transport during O&M activities.

3 The O&M of the Proposed Project would involve the periodic and routine transport, use, and disposal of
4 small quantities of hazardous materials and equipment containing hazardous materials such as paint,
5 lubricating oils, welding gases, hydraulic fluid, and cleaning solvents for WTG and substation
6 maintenance. The greatest potential for contamination of surface water from these materials would be
7 from petroleum products stored at the O&M building compound and mineral oils contained within
8 electrical transformers across the project area. The Applicant's Emergency Response Plan (APM-7) and
9 SPCCP (APM-5) would provide for hazardous material spill prevention and clean-up measures, were a
10 spill to occur during O&M.

11 The O&M of the Proposed Action's 96 WTGs, two substations, O&M building, Western's proposed
12 switching station, 8.7 miles of transmission interconnect lines, four MET towers, remaining laydown
13 area, and 35.9 miles of access roads would result in low impacts on water quality. As described above,
14 implementation of required BMPs and compliance with required water quality permits would occur for
15 protecting water quality during the operational phase of the Proposed Project. Effects of the proposed
16 switching station would be reduced through implementation of Western's Construction Standard 13.

17 A similar scale of effort and impact on water resources would occur with decommissioning as with the
18 construction and O&M phases, therefore, there would not be a substantial impact on water resources.

19 **Flooding**

20 Development of the Proposed Action could result in an increase in flooding hazard if it were to:

- 21 • Impede or redirect flood flows;
- 22 • Cause inundation or additional risk associated with a debris flow; or
- 23 • Otherwise increase the rate or amount of surface water leaving the site.

24 Flood hazards can increase as a result of multiple factors, including altering the natural drainage of an
25 area to prevent adequate water flow, reducing the area within which precipitation and runoff infiltrate,
26 and increasing the impervious surface area in a region.

27 As noted in Section 3.3.3, Floodplains, a designated Zone A 100-year floodplain traverses the
28 southwestern part of the Proposed Project area with approximately 0.32 square mile of a FEMA-
29 designated 100-year floodplain within and along the southwestern boundary of the project area. Drainage
30 within the project site occurs via sheet flow to migrating dry wash drainages, which is typical of an
31 alluvial fan. Due to their loose nature, alluvial fans naturally change during a process known as
32 hydrologic reworking. Extreme rain events can suspend sand, gravel, or even boulders and transport them
33 downstream or downslope, resulting in damage to structures affected by flood waters (USGS 2001). If a
34 flood event were to occur, it could result in flooding that could cause substantial damage across the
35 project area as well as substantial localized destruction.

36 Potential impacts related to flooding issues at Western's proposed switching station site, located on
37 alluvial deposits, will be mitigated by Western requiring the construction contractor to comply with
38 Western's Environmental Construction Standard 13.

39 **Jurisdictional Waters, Drainages, and Riparian Areas**

40 As stated in Section 3.3.6, Jurisdictional Waters, Drainages, and Riparian Areas, based on an USACE
41 delineation of the WOUS within the Proposed Project area, the Proposed Project could impact 0.174 acre
42 of jurisdictional waters (Figure 4.3-1). The impacted acreage includes drainages to Piute Wash located
43 approximately 3 miles south-southeast of the Proposed Project site, in an area that Proposed Project
44 access roads would cross. The approved jurisdictional determination stated that the USACE would require

1 a Section 404 Permit for the construction of an access road and drainage system crossing jurisdictional
2 waters located within the boundaries of the Proposed Project.

3 Construction. Clearing and grubbing activities for project infrastructure (i.e., maintenance roads, tower
4 foundations for the WTGs and transmission lines, collection lines, staging areas, substations, and
5 switching station) could result in removal of desert wash vegetation and/or filling of jurisdictional areas.
6 Additionally, the removal of vegetation could result in increased erosion and sedimentation, resulting in
7 the degradation of water quality. During construction, the use of maintenance and access roads that cross
8 desert washes could affect jurisdictional waters by crushing vegetation and increasing erosion. The use of
9 vehicles and equipment to cross these washes could also result in degradation of water quality from the
10 potential introduction of hazardous materials such as fuels and oils.

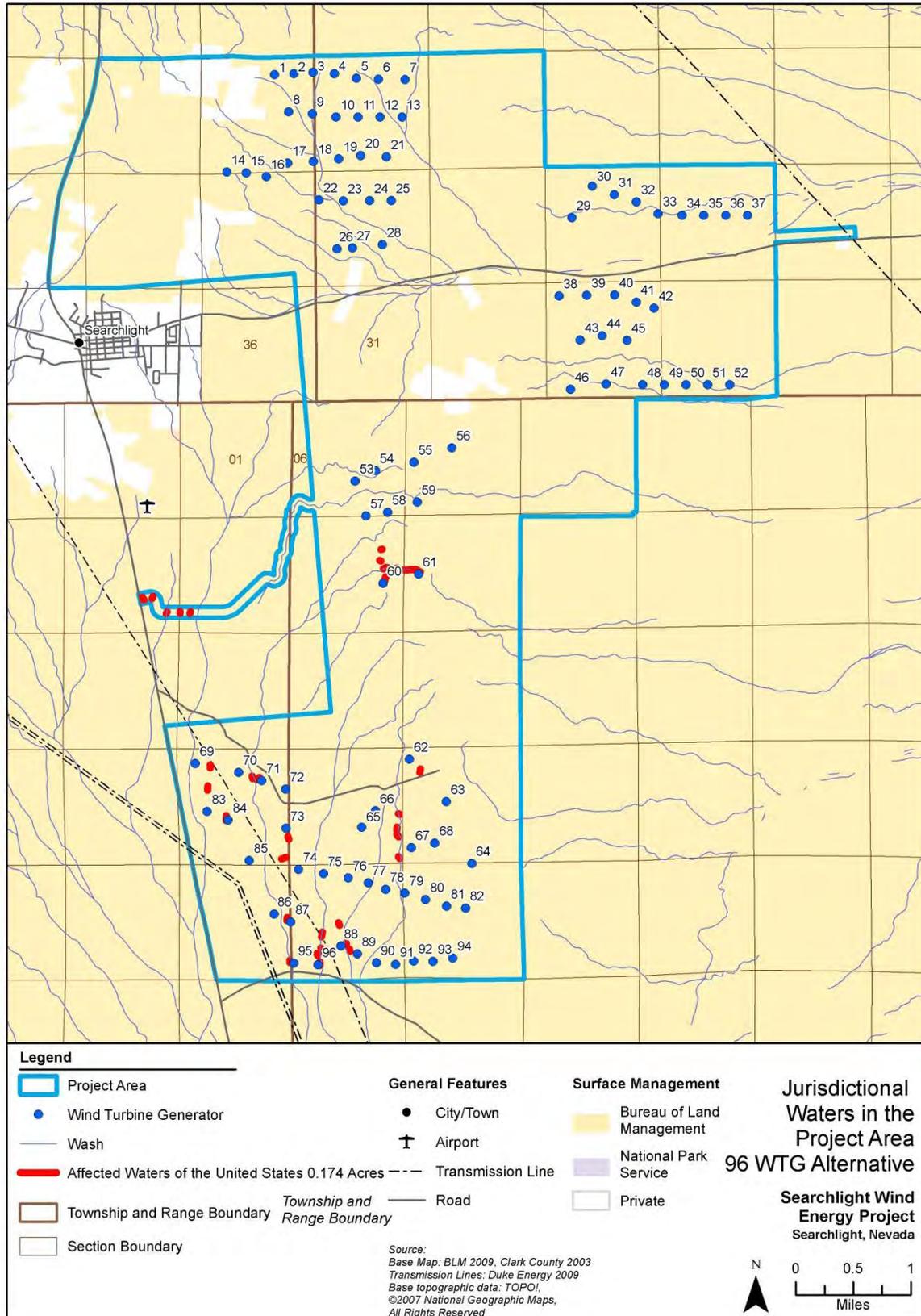
11 If WOUS within the Proposed Project area cannot be avoided, adverse impacts would be both short and
12 long term. APM 1, and APMs 3-5 would help reduce impacts to WOUS.

13 As no WOUS are located near the proposed switching station, no impacts to WOUS of the U.S. from
14 construction of the switching station are anticipated. Potential impacts related environmental impacts at
15 Western's proposed switching station site, located on alluvial deposits, will be mitigated by Western
16 requiring the construction contractor to comply with Western's Environmental Construction Standard 13.

17 O&M. Most of the potential impacts to WOUS would occur during construction; however, use of the
18 roads during O&M could affect jurisdictional waters as described above.

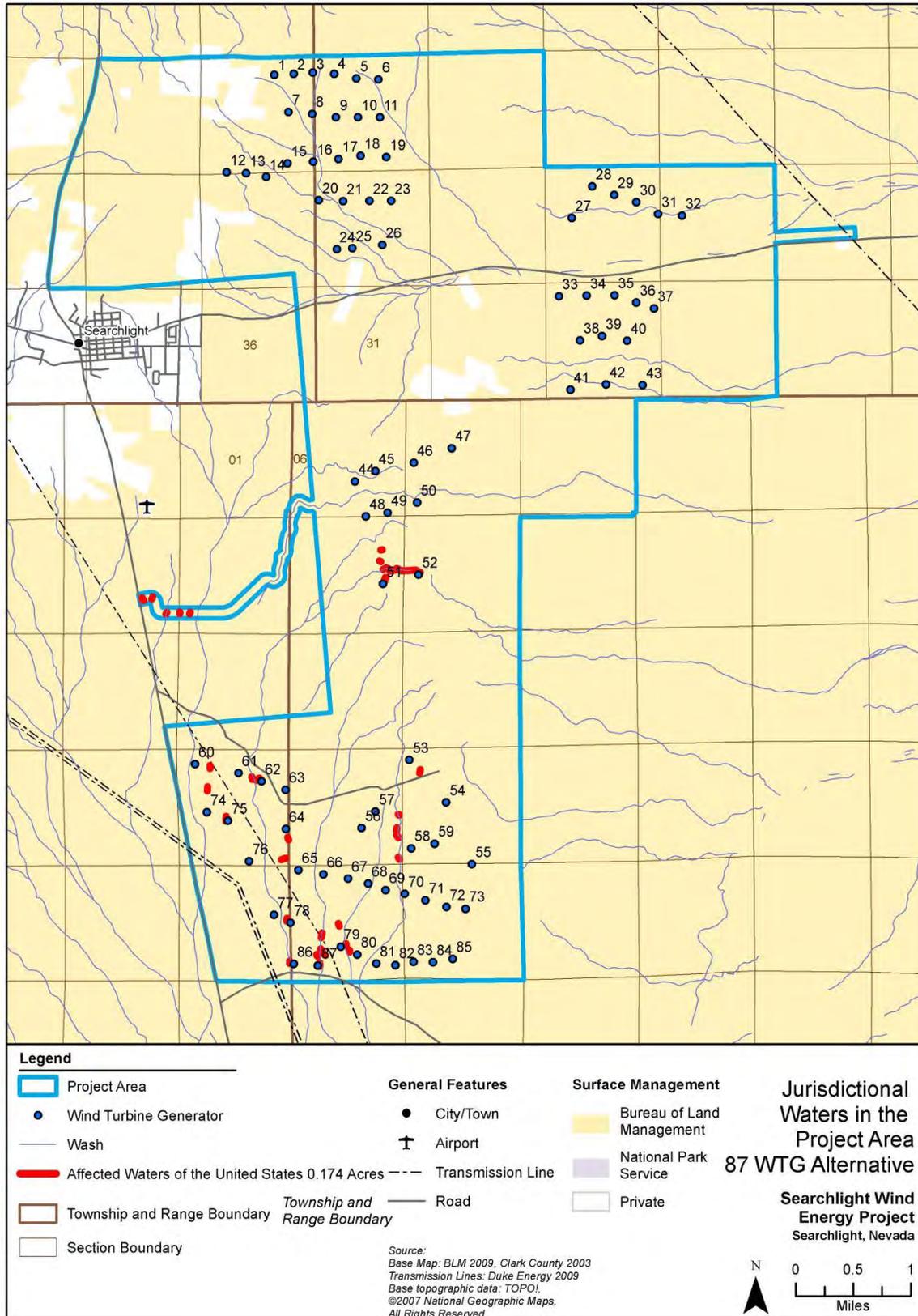
19 **4.3.2.3 87 WTG Layout Alternative**

20 Effects under the 87 WTG Layout Alternative would be similar to those identified under the 96 WTG
21 Layout Alternative. The difference in the temporarily disturbed area (230 acres) and permanently
22 disturbed area (152 acres) for construction would be less under this alternative, but the type, intensity, and
23 duration of the effects would be similar to the 96 WTG Layout Alternative. Effects to Jurisdictional
24 Waters would be the same under this alternative (Figure 4.3-2). The same mitigation used for the
25 Proposed Action would be applicable for the 87 WTG Layout Alternative.



1

2 **Figure 4.3-1. Jurisdictional Waters Potentially Affected by the 96 WTG Layout Alternative**



1

2 **Figure 4.3-2. Jurisdictional Waters Affected by the 87 WTG Layout Alternative**

4.3.3 Mitigation

To further reduce effects to water resources, the Applicant will adhere to the following mitigation measures:

MM WATER-1: Wellhead Protection. Development of the O&M building and its associated septic system would require a wellhead protection plan. The State of Nevada’s Wellhead Protection Ordinance encourages protection of public health and water supplies by ensuring there are appropriate distances between wells and potential sources of contamination (Clark County 2008a).

MM WATER-2: Construction phase erosion and sedimentation control measures. The Applicant will develop and implement erosion and sedimentation control measures to be used to minimize impacts during the construction of the Project. At a minimum, this plan will include the following:

- Implement soil stabilization measures to offset loss in vegetation including the following
- BMPs:
 - Install silt fences
 - install temporary earthen berms,
 - install straw bale barriers to reduce water velocity and flows,
 - install temporary water bars,
 - install sediment traps,
 - install stabilized entrances from public roads to minimize track-out
 - stone check dams, or other equivalent measures (including installing erosion-control measures around the perimeter of stockpiled fill material) as necessary;
- Maintain or reduce salt yields originating from public lands to meet State-adopted and Environmental Protection Agency-approved water quality standards for the Colorado River (BLM 1998);
- Implement BMPs, as identified by the state of Nevada, to minimize contributions from both point and non-point sources of pollution (including salts) from public lands (BLM 1998);
- Ensure that any nonpoint source BMPs and rehabilitation techniques meet state and local water quality requirements (BLM 2005a);
- Implement BMPs such as locating waste and excess excavated materials outside drainages to avoid sedimentation;
- Conduct regular site inspections during the construction period to see that erosion-control measures were properly installed and are functioning effectively;
- Consider use of landscape for buffering, erosion control, and stormwater runoff control for maintaining acceptable water quality conditions (Clark County 2008a);
- Obtain and comply with necessary permits in accordance with the Clean Water Act Section 404 (dredge and fill) and Section 401 (water quality) from the USACE and NDEP (NDEP 2010; and
- Implement adaptive management of actions if erosion and sedimentation control measures are found to be insufficient to control surface water at the site (any changes must be approved by the BLM).

MM WATER-3: Construction phase petroleum and hazardous material contaminated water prevention and control measures. The Applicant will develop and implement contaminant control measures to be used to minimize impacts during the operation and maintenance of the Proposed Project. At a minimum, these measures will include the following:

- Prepare and comply with a SPCCP that outlines procedures to prevent the release of hazardous substances into the environment, thereby avoiding contaminating water resources (EPA 2010);

- 1 • Stage heavy maintenance equipment over impermeable surfaces and inspect regularly for
- 2 petroleum releases;
- 3 • Conduct regular site inspections during operations and maintenance to see that petroleum and
- 4 hazardous materials products are properly stored and inventoried in accordance with local, state,
- 5 and federal regulations; and
- 6 • Implement BMPs, as identified by the state of Nevada, to minimize contributions from both point
- 7 and nonpoint sources of pollution (including salts) from public lands (BLM 1998).

8 **MM WATER-4: Operational phase erosion and sedimentation control measures.** The Applicant

9 will develop and implement erosion and sedimentation control measures to be used to minimize impacts

10 during the operations and maintenance of the Proposed Project. At a minimum, this plan will include the

11 following:

- 12 • Implement and maintain soil stabilization measures developed for MM WATER-2 to offset loss
- 13 in vegetation;
- 14 • Conduct biannual and post-storm monitoring of erosion and sedimentation; and
- 15 • Conduct regular site inspections during operation and maintenance to see that erosion-control
- 16 measures installed during the construction-phase (MM WATER-2) are properly installed and are
- 17 functioning effectively.

18 **MM WATER-5: Operational phase petroleum and hazardous material contaminated water**

19 **prevention and control measures.** The Applicant will develop and implement contamination control

20 measures to be used to minimize impacts during the construction of the Proposed Project. At a minimum,

21 these measures will include:

- 22 • Prepare and comply with a SPCCP that outlines procedures to prevent the release of hazardous
- 23 substances into the environment, thereby avoiding contaminating water resources (EPA 2010);
- 24 • Stage heavy equipment and O&M vehicles over impermeable surfaces and inspect regularly for
- 25 petroleum releases;
- 26 • Conduct regular site inspections during the O&M phase to see that petroleum and hazardous
- 27 materials products are properly stored and inventoried in accordance with local, state, and federal
- 28 regulations; and
- 29 • Implement BMPs, as identified by the State of Nevada, to minimize contributions from both point
- 30 and nonpoint sources of pollution (including salts) from public lands (BLM 1998).

31 **MM WATER-6: Drainage Crossing Design.** If drainages cannot be avoided by infrastructure

32 placement, then the Applicant will design drainage crossings to accommodate estimated peak flows and

33 ensure that natural volume capacity can be maintained throughout construction and upon post-

34 construction restoration. This measure is necessary to minimize the amount of erosion and degradation to

35 which drainages are subject.

36 **MM WATER-7: Stormwater Monitoring and Response Plan.** The Applicant will develop and

37 implement a stormwater monitoring and response plan to be used to minimize impacts from flood damage

38 during the life of the Project. At a minimum, this plan will include:

- 39 • Visual surveys of all structures for scour following major storm events;
- 40 • Visual surveys of drainage crossings and fencing to check for damage;
- 41 • Cleanup of broken equipment if failures do occur;
- 42 • Inspection and cleanup of downstream areas if debris is transported off site; and
- 43 • Adaptive management of flood protection and erosion actions if the monitoring plan reveals
- 44 routine damage to project components due to flooding (Any changes must be approved by the
- 45 BLM).

1 **4.3.4 Residual Effects**

2 Residual effects on water resources or hydrology resulting from implementation of the Proposed Action
3 or alternatives would include localized increases to sedimentation and scour in site drainages; a higher
4 volume of concentrated stormwater due to drainage structures; a potentially higher flood hazard; and
5 potentially altered drainage patterns due to the prevention of uninhibited channel migration within the
6 Proposed Project site. Residual effects on water resources or hydrology resulting from construction of
7 Western’s proposed switching station would include localized increases to sedimentation and scour in
8 drainages, potential concentration of stormwater due to drainage structures and potential higher flood
9 hazard due to altered drainage patterns.

1 **4.4 Biological Resources Impacts**

2 This section discusses effects on biological resources that might occur with implementation of the
3 Proposed Action or alternatives. This section is divided into several subsections by resource: vegetation,
4 sensitive plant species, wildlife, and sensitive wildlife species resources. After the discussion of effects in
5 each subsection, the mitigation measures are presented. These measures, which are designed to eliminate
6 or reduce impacts to an acceptable level, are followed by a discussion of residual impacts.

7 **4.4.1 Vegetation**

8 **4.4.1.1 Indicators**

9 The Proposed Project would affect vegetation resources or special status plant species if:

- 10 • The structure, function, and persistence of sensitive upland vegetation communities were altered;
- 11 • Special status plant species, including cacti and yucca were adversely affected either directly or
12 indirectly; or
- 13 • Invasive, non-native plants, or noxious weeds were introduced; or
- 14 • Invasive, non-native plants or noxious weeds already occurring in the area proliferated.

15 **4.4.1.2 Direct and Indirect Effects by Alternative**

16 Vegetation in the Proposed Project area is typical of the Mojave Desert. The implementation of the
17 Proposed Project would affect all forms of vegetation on and surrounding the site. This section describes
18 the effects on vegetation as a result of each alternative using the respective methodology under NEPA. To
19 compare effects, this analysis defines the temporal scale (time), spatial extent (area), and intensity of
20 effects for each alternative. Additionally, effects during different phases of the Proposed Project (i.e.,
21 construction, O&M, and decommissioning) are addressed in this section. Direct and indirect effects,
22 APMs and MMs, and residual effects on vegetation resources are discussed below.

23 **No Action Alternative**

24 Under the No Action Alternative, the ROW application would be denied and the Proposed Project would
25 not be built; therefore, no project related effects on vegetation would occur.

26 **Proposed Action – 96 WTG Layout Alternative**

27 Under the 96 WTG Layout Alternative, the BLM would approve the ROW applications and the Proposed
28 Project and Western's proposed switching station would proceed. Under this alternative, approximately
29 249 acres would be temporarily disturbed and 160 acres would be permanently disturbed. The Applicant
30 has incorporated the following APMs to avoid and minimize impacts on vegetation resources of the
31 Proposed Project area:

- 32 • APM-9 Weed Control Plan
- 33 • APM-10 Site Rehabilitation Plan and Facility Decommissioning Plan
- 34 • APM-13 Environmental Clearance

35 Western will require the construction contractor to comply with Environmental Construction Standard 13
36 for construction of Western's proposed switching station, specifically the following sections:

- 37 • Section 13.2 Environmental Requirements
- 38 • Section 13.3 Landscape Preservation
- 39 • Section 13.5 Noxious Weed Control
- 40 • Section 13.16 Prevention of Water Pollution

- Section 13.19 Conservation of Natural Resources

Construction. During the 8 to 12 month construction phase, grading, excavation, trenching or other ground-disturbing activities required for installation of WTG and transmission line foundations and construction of substations, O&M building, ancillary facilities, and roads, might cause the direct mortality and loss of vegetation within the project area. The vegetation communities that would primarily be affected are Mojave Creosotebush-White Bursage Desert Scrub, Mojave Mid-Elevation Mixed Desert Scrub, Inter-Mountain Basins Semi-Desert Shrub Steppe, and North American Warm Desert Bedrock Cliff and Outcrop. Collectively these vegetation communities and land cover types cover approximately 97% of the Proposed Project area. Permanent removal and disturbance of vegetation communities associated with the 96 WTG Layout Alternative would encompass up to 160 acres.

Noxious weeds and invasive species can displace native vegetation, increase fire frequency, and reduce wildlife habitat quality. One direct effect of the Proposed Project is the potential for the introduction or proliferation of noxious weeds into the project area. The only noxious weed species found in the project area was Sahara mustard. In addition to noxious weeds, the project area may be more vulnerable to the proliferation of invasive species that already occur in the area, including red brome and red-stemmed filaree.

Temporary impacts are effects that result in short-term disturbance to natural vegetation communities from surface disturbances such as grading, blasting, excavation, or trenching and trampling. Short-term impacts include habitat disturbance, temporary change in plant composition, and mortality of individuals. Temporary impacts might persist for several years as vegetation reestablishes to preconstruction conditions. Temporary disturbance would occur at the two temporary laydown areas, turbine assembly areas, trenching areas, and temporary access roads. Vegetation might be crushed or temporarily removed. Areas where the vegetation is crushed would be allowed to revegetate after construction is finished. It is anticipated that approximately 249 acres of vegetation communities would be disturbed during construction.

Construction of Western's proposed switching station would result in the removal or disturbance of Mojave Creosotebush-White Bursage Desert Scrub. Effects to vegetation would be similar to those described above. It is anticipated that 7 acres would be disturbed during construction, but half of that area (2.5 acres) would be reclaimed post-construction. Western would minimize effects to vegetation by require its contractor to comply with Construction Standard 13.

O&M and Decommissioning. No additional effects on vegetation would occur during operation and maintenance and decommissioning of the facility or the switching station. Ongoing maintenance activities might increase the potential for introducing or spreading noxious or invasive weed species throughout the project area and possibly into adjacent areas.

During public scoping, concerns were expressed regarding potential noise and vibration impacts to nonhuman receivers (i.e., wildlife). However, there are no known laws, ordinances, regulations, or standards that address noise exposure to wildlife in the project vicinity. Research on the potential effects of noise and vibration on wildlife continues to develop, showing that these effects can vary with species, settings, seasons, and other parameters that remain undiscovered or require better understanding. Recent studies suggest that certain species either adapt when their environment becomes noisier, or the masking of normal acoustical cues seems to challenge both prey and predator with what one might call relatively equal measure (Barber et al., 2009). As research specific to noise effects from wind turbines further evolves findings should be utilized to develop technologies and measures to further evaluate and minimize noise impacts to wildlife, if warranted.

87 WTG Layout Alternative

Effects under the 87 WTG Layout Alternative would be similar to those identified under the 96 WTG Layout Alternative. The temporarily disturbed area and permanently disturbed area would be decreased

1 under this alternative because 9 less WTGs would be constructed. Approximately 152 acres of native
2 vegetation would be permanently removed, approximately 8 acres less than under the 96 WTG Layout
3 Alternative. Disturbance of a temporary nature would affect approximately 230 acres, which is
4 approximately 19 acres less than under the 96 WTG Layout Alternative. The type, intensity, and duration
5 of effects from construction, O&M, and decommissioning activities on vegetation communities,
6 individual species, and habitat would be similar to the 96 WTG Layout Alternative.

7 **4.4.1.3 Mitigation**

8 The Applicant has proposed a Weed Control Plan (APM-9), a Site Rehabilitation Plan and Facility
9 Decommissioning Plan (AMP-10), and environmental clearance (APM-13). Western would minimize
10 effects to vegetation by implementing Construction Standard 13 and reclaiming approximately half (2.5
11 acres) of the disturbed area. Additionally, the Applicant would implement the following mitigation
12 measures will help reduce the effects to vegetation:

13 MM-BIO-1: Interim Reclamation. Interim reclamation actions are intended to reclaim areas of
14 temporary use such as construction staging areas, and road widening areas. Interim reclamation actions
15 will be initiated upon cessation of area use and no later than 12 months from commencement of operation,
16 weather permitting. Interim reclamation will include the following:

- 17 • Areas that were cleared for staging or road widening and that are not needed for operation of
18 the Proposed Project will be recontoured to the original contour, if feasible, or if not feasible,
19 to an interim contour that bends with the surrounding topography.
- 20 • Wastewater, solids, and pond liners will be removed and disposed of at a proper facility.
21 Areas that were occupied by evaporation ponds will be backfilled with native soil to match
22 the existing surrounding grade and restore drainage function.
- 23 • Stockpiled topsoil will be spread evenly over the entire disturbed area to within a few feet of
24 the production facilities. Salvaged cactus and yucca would be replanted in these disturbed
25 areas.

26 **4.4.1.4 Residual Effects**

27 Despite the implementation of mitigation measures, it is possible that noxious or invasive plant species
28 could be introduced or proliferate in the Proposed Project area. Artificial water sources used for
29 construction activities (such as water for dust control or for the concrete batch plant operation) could
30 encourage and support invasive and weed species propagation. A weed management plan (APM-9) has
31 been developed that specifies that the Applicant will maintain and control weeds, within feasibly
32 practicable means, within the Proposed Project site boundaries, construction areas, and areas influenced
33 by project activities. Please refer to the *Searchlight Wind Farm Weed Management Plan* (AEC 2011) for
34 more details on weed management (Appendix B).

35 **4.4.2 Special Status Plant Species**

36 **4.4.2.1 Direct and Indirect Effects by Alternative**

37 According to the *Searchlight Botanical Survey Report* (AEC 2010), no special status plant species were
38 found in the Proposed Project area; therefore, implementation of the 96 WTG Layout Alternative or the
39 87 WTG Layout Alternative would not have an effect on special status plant species.

40 **4.4.2.2 Mitigation**

41 No special status plant species were found in the Proposed Project area; therefore, no mitigation is
42 proposed.

1 **4.4.3 Cacti and Yucca**

2 **4.4.3.1 Direct and Indirect Effects by Alternative**

3 **No Action Alternative**

4 Under the No Action Alternative, the ROW application would be denied and the Proposed Project would
5 not be built; therefore, no project related effects on cacti and yucca would occur.

6 **96 WTG Layout Alternative**

7 Construction. Cacti and yucca would be removed during construction of the Proposed Project facilities
8 including construction of new roads and the upgrading of existing roads. The northern portion of the
9 project area is characterized by Joshua trees and yucca species in higher abundance than in the central and
10 southern portions of the project area. Individual trees could be removed during the upgrading of existing
11 roads, overhead transmission lines, and laydown yards. Effects to cactus and yucca from construction of
12 the proposed switching station would be similar.

13 O&M and Decommissioning. During O&M and decommissioning, there would be no activities which
14 would have effects on cacti and yucca. Effects on cacti and yucca from construction activities under the
15 action alternatives would be minimized with the implementation of the appropriate APMs and MMs.

16 **87 Layout Alternative**

17 Under the 96 WTG Layout Alternative, effects on cacti and yucca would be similar to those identified
18 under the 87 WTG Layout Alternative; however, nine less turbines are associated with this alternative,
19 thus causing less acres of permanent and temporary disturbance. Approximately 152 acres of native
20 vegetation would be permanently removed, which is 8 acres less than under the 96 WTG Layout
21 Alternative. Disturbance of a temporary nature would affect 230 acres, which is 19 acres less than under
22 the 96 WTG Layout Alternative. However, the type, intensity, and duration of the effects would be
23 similar to the 96 WTG Layout Alternative.

24 **4.4.3.2 Mitigation**

25 MM-BIO-2: Cactus and Yucca Salvage Plan. The Applicant will prepare and implement a cactus and
26 yucca salvage plan. Removal of cacti and yucca in Nevada is governed by NRS 527.060 - .120
27 ("Protection of Christmas Trees, Cacti and Yucca") and the associated regulations (NAC Chapter
28 527). NAC 527.090 requires that all cacti and yucca removed or possessed for commercial purposes
29 have a tag attached thereto. When a cacti or yucca is removed for commercial purposes from BLM-
30 administered land, a tag for the plant is issued by the BLM. "Commercial purposes" is defined as the
31 removal or possession of six or more cacti or yucca on any one calendar day or the removal or possession
32 of less than six plants each for seven or more consecutive days, except when such removal or possession
33 is for scientific or education purposes. See NRS 527.070. Accordingly, to the extent that cacti or yucca
34 removed during the construction of the Proposed Project meet the definition of "commercial purposes,"
35 Nevada law requires that tags be obtained from the BLM for each such plant.

36 **4.4.3.3 Residual Effects**

37 Residual effects special status plant species would be the same as the residual effects described previously
38 for vegetation.

39 **4.4.4 Wildlife**

40 Wildlife in the Proposed Project area is typical of the Mojave Desert. The implementation of the Proposed
41 Project would affect non-listed wildlife species (wildlife) on and surrounding the site. This section

1 describes the effects on wildlife as a result of each alternative using the respective methodology under
2 NEPA. To compare effects, this analysis defines the temporal scale (time), spatial extent (area), and
3 intensity of effects for each alternative. Additionally, effects during different phases of the Proposed
4 Project (i.e., construction, O&M, and decommissioning) are addressed in this section. Direct and indirect
5 effects, APMs and MMs, and residual effects on wildlife are discussed below.

6 **4.4.4.1 Indicators**

7 The Proposed Project would affect wildlife if it altered the diversity or population of any wildlife species.

8 **4.4.4.2 Direct and Indirect Impacts by Alternative**

9 **No Action Alternative**

10 Under the No Action Alternative, the ROW application would be denied and the Proposed Project would
11 not be built; therefore, no project related effects on wildlife resources would occur.

12 **Proposed Action - 96 WTG Layout Alternative**

13 Under the 96 WTG Layout Alternative, the BLM would approve the ROW applications and the Proposed
14 Project and Western's proposed switching station would proceed. Under this alternative, approximately
15 249 acres would be temporarily disturbed and 160 acres would be permanently disturbed. The Applicant
16 has incorporated the following APMs to avoid and minimize impacts on wildlife resources of the
17 Proposed Project area:

- 18 • APM-10 Site Rehabilitation Plan and Facility Decommissioning Plan
- 19 • APM-13 Environmental Clearance

20 Western will require the construction contractor to comply with Environmental Construction Standard 13
21 for construction of Western's proposed switching station, specifically the following sections:

- 22 • Section 13.2 Environmental Requirements
- 23 • Section 13.3 Landscape Preservation
- 24 • Section 13.5 Noxious Weed Control
- 25 • Section 13.16 Prevention of Water Pollution
- 26 • Section 13.19 Conservation of Natural Resources

27 Construction. Grading, excavation, trenching, or other ground-disturbing activities could directly result in
28 mortality to various wildlife species. Some species that are particularly mobile might be able to avoid
29 injury or mortality by leaving the area. However, some wildlife, such as nocturnal species or species that
30 use burrows, might be more susceptible to injury or mortality during grading activities.

31 Although temporary in nature, noise and activity associated with construction could cause animals to
32 avoid the area, thus altering their normal behavior patterns.

33 The Proposed Project would remove 160 acres of wildlife habitat. However, most of this habitat is
34 Sonora-Mojave Creosote Bush -White Bursage Desert Scrub, which is the most common type of habitat
35 throughout the project area, project vicinity, and southern Nevada.

36 Direct and indirect impacts from construction of the proposed switching station are similar to those
37 identified above, although construction of the switching station would temporarily affect 7 acres of
38 wildlife habitat of which 2.5 acres would be reclaimed post construction.

39 O&M and Decommissioning. During project operation and maintenance, newly established roads and
40 increased traffic could result in more vehicle/wildlife collisions, thereby resulting in injury or death to
41 wildlife. This might be of particular concern for reptiles and species that use roads for heat sources or for
42 other small wildlife.

1 **87 WTG Layout Alternative**

2 Under the 87 WTG Layout Alternative, effects on wildlife would be similar to those identified under the
3 96 WTG Layout Alternative, although nine less turbines are associated with this alternative reducing the
4 acres of permanent (152 acres) and temporary disturbance (249 acres), thus slightly reducing the potential
5 to affect wildlife. However, the type, intensity, and duration of the effects would be similar for both
6 action alternatives.

7 **4.4.4.3 Mitigation**

8 Because the Applicant has proposed environmental clearance (APM-13) and Western implements
9 Construction Standard 13; no further mitigation is proposed.

10 **4.4.4.4 Residual Effects**

11 Residual effects on wildlife diversity, populations, and habitat resulting from implementation of the
12 Proposed Action or alternatives would be long-term. Effects include the permanent loss of 152-160 acres
13 of wildlife habitat, resulting in the loss of shelter, breeding and foraging opportunities in the project area,
14 and barriers and hazardous to wildlife behavior patterns with construction of new roads and transmission
15 line towers.

16 **4.4.5 Special Status Wildlife Species**

17 This section describes the Proposed Project effects on special status wildlife species, which are species
18 that are state or federally protected. Effects are described in relation to the area affected, the duration of
19 the effects, and the intensity of the effect.

20 **4.4.5.1 Indicators**

21 The Proposed Project would affect special status wildlife species if:

- 22 • Substantially adverse effects, either directly or through habitat modification, on any special status
23 wildlife species occurs;
- 24 • Direct or indirect impacts on candidate or special status species populations or habitat that would
25 contribute to or result in the federal or state listing of the species (e.g., substantially reducing
26 species numbers, or resulting in the permanent loss of habitat essential for the species continued
27 existence);
- 28 • Result in changes in the environment that would increase opportunities for predators of special
29 status species; or
- 30 • Interfere substantially with the movement of any native resident or migratory wildlife species or
31 with established native resident or migratory wildlife corridors.

32 **4.4.5.2 Desert Tortoise – Direct and Indirect Impacts by Alternatives**

33 **No Action Alternative**

34 Under the No Action Alternative, the ROW application would be denied and the Proposed Project would
35 not be built; therefore, no project related effects on desert tortoise would occur.

36 **Proposed Action - 96 WTG Layout Alternative**

37 Construction. Permanent removal of desert tortoise habitat associated with the 87 WTG Layout
38 Alternative would encompass up to 160 acres. Approximately 249 acres of desert tortoise habitat would
39 be temporarily disturbed. Similar to the effects on other wildlife, tortoises might be killed or injured
40 during construction activities. Tortoises in the area during initial ground grading activities could be

1 crushed, killed, or trapped in burrows. Construction traffic on roads could increase the potential for
2 tortoise/vehicle collisions. Construction noise and vibration could affect tortoises' normal activity
3 patterns. Tortoises might be attracted to the water used for dust control on the site or seek shade under
4 construction equipment and be at risk of injury or death. Construction site litter and new perching
5 opportunities might attract ravens and other raptors that prey on juvenile tortoises, thus potentially
6 causing an increase in juvenile tortoise mortality.

7 The USFWS typically requires biological monitors to clear construction areas so that tortoises are not
8 injured or killed during construction activities. Capturing, handling, and relocating tortoises away from
9 construction activities would result in harassment and potentially injury or death. Injury or death can
10 result from improper handling of tortoises, or as a result of a tortoise voiding its bladder during handling.
11 Additionally, tortoises infected with upper respiratory tract disease (e.g., *Mycoplasma agassizii*, *M.*
12 *testudium*), if relocated, could infect other tortoises in the area and result in the illness and mortality of
13 infected individuals.

14 Direct and indirect impacts from construction of the proposed switching station are similar to those
15 identified above, although construction of the switching station would temporarily affect 7 acres of desert
16 tortoise habitat of which 2.5 acres would be reclaimed post construction.

17 O&M and Decommissioning. Continuous operation and maintenance of the wind turbines would result in
18 increased traffic and thereby potentially increase vehicle/tortoise collisions. Additionally, new roads may
19 also facilitate increased traffic from OHV recreationalists further increasing the potential for vehicle /
20 tortoise collisions. Additionally, traffic increase could introduce or spread nonnative invasive or noxious
21 weed species, which would alter natural ecosystems and adversely affect desert tortoise habitat.

22 **87 WTG Layout Alternative**

23 Under the 87 WTG Layout Alternative, effects on desert tortoise would be similar to those identified
24 under the 96 WTG Layout Alternative, although nine less turbines are associated with this alternative
25 resulting in less acres of permanent and temporary disturbance and thus a slightly reduced potential to
26 harm this species. Approximately 152 acres of desert tortoise habitat would be permanently removed,
27 approximately 8 acres less than under the 87 WTG Layout Alternative. Disturbance of a temporary nature
28 would affect approximately 230 acres, which is approximately 18 acres less than under the 87 WTG
29 Layout Alternative. However, the type, intensity, and duration of the effects would be similar under either
30 action alternative.

31 **4.4.5.3 Mitigation**

32 To further reduce impacts on desert tortoise, the Applicant and Western will adhere to the following
33 mitigation measures:

34 MM-BIO-3: Biological Opinion. To reduce adverse effects on desert tortoise, all terms and conditions of
35 the USFWS Biological Opinion would be implemented. Terms and conditions may include but are not
36 limited to the following:

- 37 • Conduct Preconstruction Surveys. Preconstruction biological clearance surveys would be
38 conducted by qualified biologists to identify special-status plants and wildlife in areas proposed
39 for development.
- 40 • Desert Tortoise Fencing. Desert tortoise fencing would be installed around Western's proposed
41 switching station. A qualified and USFWS approved desert tortoise biologist would be on site at
42 all times during fence construction to oversee compliance with all of the measures described in
43 the Biological Opinion including halting construction that may endanger a desert tortoise until the
44 risk has been eliminated. Procedures will be implemented as identified in USFWS approved
45 protocols (Desert Tortoise Council Guidelines for Handling Desert Tortoises During Construction
46 Projects 1994, revised 1999).

- 1 • Worker Environmental Awareness Program. A Worker Environmental Awareness Program
2 (WEAP) would be prepared. All construction crews and contractors would be required to
3 participate in WEAP training prior to starting work on the project. The WEAP training would
4 include a review of the special-status species and other sensitive resources that could exist in the
5 project area, the locations of sensitive biological resources and their legal status and protections,
6 and measures to be implemented for avoidance of these sensitive resources. Special emphasis will
7 be placed on protection measures developed for the desert tortoise and the consequences of non-
8 compliance. Written material will be provided to employees at orientation and participants will
9 sign an attendance sheet documenting their participation.
- 10 • Biological Monitors. For activities conducted between March 15 and November 1 in desert
11 tortoise habitat, all activities in which encounters with tortoises might occur would be monitored
12 by a qualified or authorized biologist. The biologist would be informed of tortoises relocated
13 during preconstruction surveys so that he or she could watch for the relocated tortoises in case
14 they attempted to return to the construction site. The qualified or authorized biologist would
15 watch for tortoises wandering into the construction areas, check under vehicles, examine
16 excavations and other potential pitfalls for entrapped animals, examine exclusion fencing, and
17 conduct other activities to ensure that death or injuries of tortoises were minimized.
- 18 • Overnight Hazards. No overnight hazards to desert tortoises (e.g., auger holes, trenches, pits, or
19 other steep-sided depressions) would be left unfenced or uncovered; such hazards would be
20 eliminated each day prior to the work crew and biologist leaving the site. All excavations will be
21 inspected for trapped desert tortoises at the beginning, middle, and end of the work day, at a
22 minimum, but will also be continuously monitored by. Should a tortoise become entrapped, the
23 authorized biologist will remove it immediately.
- 24 • Speed Limits and Signage. A speed limit of 15 miles per hour will be maintained while on the
25 construction site, access roads, and storage areas during the periods of highest tortoise activity
26 (March 1 through November 1) and not to exceed 25 miles per hour during periods of low
27 tortoise activity. This will reduce dust and allow for observation of tortoises in the road. Speed-
28 limit and caution signs will be installed along access roads and service roads.
- 29 • Trash and Litter Control. Trash and food items will be disposed properly in predator-proof
30 containers with resealing lids. Trash will be emptied and removed from the project site on a
31 period basis. Trash removal reduces the attractiveness of the area to opportunistic predators such
32 as ravens, coyotes, and fox.
- 33 • Habitat Compensation. Prior to surface disturbance activities within desert tortoise habitat, the
34 project proponent would pay one-time remuneration fee (per acre of proposed disturbance) into
35 the Desert Tortoise Public Lands Conservation Fund Number 730-9999-2315. The compensation
36 for habitat loss under Section 7 of the ESA is an annually adjusted rate, currently \$786/acre, for
37 development on BLM-managed lands.

38 4.4.5.4 Desert Tortoise - Residual Effects

39 Residual effects on desert tortoise would be the same as the residual effects on wildlife species.

40 4.4.5.5 Chuckwalla and Gila Monster - Direct and Indirect Effects by Alternative

41 No Action Alternative

42 Under the No Action Alternative, the ROW application would be denied and the Proposed Project would
43 not be built; therefore, no project related effects on chuckwalla and Gila monster would occur.

1 **Proposed Action - 96 WTG Layout Alternative**

2 Construction. Effects on chuckwalla and Gila monster would be similar to those discussed for desert
3 tortoise. These protected reptiles could be crushed, injured, or killed during grading activities. However,
4 chuckwallas prefer rocky cliff habitat, whereas turbine pads would be constructed on less rocky, level
5 ground; therefore, while encounters with chuckwallas are possible, they are not likely. Gila monsters
6 spend up to 95% of their lives below ground, and not much is known about their habitats (NDOW
7 2007b); however, it is possible that a Gila monster could be encountered and subsequently injured or
8 killed during construction activities.

9 It is unlikely that construction of Western's proposed switching station would affect chuckwalla as there
10 is no chuckwalla habitat in the vicinity. Effects of construction of the Switching Station on Gila monster
11 would be similar to those associated with those described above.

12 O&M and Decommissioning. Similar to effects on other wildlife, increased traffic during operation and
13 maintenance could increase the potential for reptile/vehicle collisions to cause Gila monster and
14 chuckwalla injury or death.

15 **87 WTG Layout Alternative**

16 Under the 87 WTG Layout Alternative, effects on chuckwalla and Gila monster would be similar to those
17 identified under the 96 WTG Layout Alternative; however, nine less turbines are associated with the
18 project, thus causing less acres of permanent and temporary disturbance and thus a slightly greater
19 potential to harm these species. Approximately 152 acres of native vegetation would be permanently
20 removed, 8 acres more than under the 96 WTG Layout Alternative. Disturbance of a temporary nature
21 would affect 230 acres, which is 18 acres less than under the 96 WTG Layout Alternative. However, the
22 type, intensity, and duration of the effects would be similar.

23 **4.4.5.6 Mitigation**

24 To further reduce impacts on Chuckwalla and Gila monsters, the following measures would be
25 implemented by both the Applicant and Western:

26 MM-BIO-4: Reptile Mitigation and Monitoring Plan. A Wildlife Mitigation and Monitoring Plan
27 would be implemented to reduce impacts on chuckwalla and Gila monster. Terms and conditions may
28 include but are not limited to the following:

- 29 • Protocols. Live Gila monsters, if observed, will be removed in accordance with NDOT protocols
30 issued November 2007.
- 31 • Surveys. Preconstruction biological clearance surveys would be conducted by qualified biologists
32 to identify special-status plants and wildlife in areas proposed for development.
- 33 • WEAP. Gila monster and chuckwalla identification and notification protocols will be included in
34 the WEAP for desert tortoise.

35 **4.4.5.7 Residual Effects to Chuckwalla and Gila Monster**

36 Residual effects on chuckwalla and Gila monster would be the same as the residual effects described
37 previously for other wildlife species.

38 **4.4.5.8 Bats - Direct and Indirect Effects by Alternative**

39 **No Action Alternative**

40 Under the No Action Alternative, the ROW application would be denied and the Proposed Project would
41 not be built; therefore, no project related effects on bats would occur.

1 **Proposed Action - 96 WTG Layout Alternative**

2 Construction. Although temporary in nature, project construction activities and increased vehicle traffic
3 could result in injury or mortality to bats during early morning or early evening hours when construction
4 activities overlap bat foraging activities. It is possible that bat/vehicle collisions could occur; however,
5 bats are able to fly over roads to avoid vehicles, so that effect is expected to be minimal. Noise from
6 construction activities might awaken day roosting bats causing depletion of crucial energy reserves.

7 Approximately 160 acres of bat foraging habitat would be permanently removed and 249 acres would be
8 temporarily affected during construction activities.

9 Effects to bats as a result of construction of Western's proposed switching station are expected to be
10 similar to those for the 87 WTG Layout Alternative; however, only 3.5 acres of bat foraging habitat
11 would be permanently removed.

12 O&M and Decommissioning. During operation of the wind energy facility, bats might be attracted to or
13 passively encounter the RSA (Horn et al. 2008). Bats might fly into or be hit by turbine rotors, which
14 could cause injury or death, while they are congregating or foraging for food. High-flying bats, such as
15 Brazilian free-tailed bats (state sensitive species) and silver-haired bat (no status), both of which were
16 found in the Proposed Project area, might be more susceptible to collisions with turbine blades based on
17 previous studies (Arnett et al. 2008).

18 Bats could also suffer from barotrauma, which results when bats fly within a low-pressure area near the
19 turbine rotors (Baerwald et al. 2008). When a bat flies into this low-pressure area, a rapid expansion of
20 air in the lungs results in haemothorax (or a rupture of pulmonary tissue and bleeding), causing injury and
21 eventually death. The number of bats that might suffer from barotrauma as a result of the Proposed
22 Project cannot be estimated because some could be injured at the facility and then die outside of the post-
23 construction monitoring area (NWCC 2010).

24 No topographic or habitat features that are considered bat attractants exist within or immediately adjacent
25 to the Proposed Project site, which may account for low bat use in the area when compared to bat
26 activities at elevations elsewhere in Nevada (O'Farrell Biological Consulting 2010). Even for the most
27 heavily used sampling locations within the Proposed Project area, total activity was orders of magnitude
28 less than activity recorded at other locations that did have attractant habitat features. Unfortunately, no
29 correlation between preconstruction surveys and post-construction fatalities has been established (NWCC
30 2010). Therefore, even though bat activity in the area is lower than at other locations in Nevada, the
31 proportional effects on the bat population cannot be predicted. Post-construction monitoring will be
32 *essential to quantifying effects on bats.*

33 No effects to bats from O&M and decommissioning of Western's proposed switching station are
34 anticipated.

35 **87 WTG Layout Alternative**

36 Under the 87 WTG Layout Alternative, effects on bats would be similar to those identified under the 96
37 WTG Layout Alternative; however, nine less turbines are associated with this alternative, slightly
38 decreasing the potential for bat / rotor collisions. The type, intensity, and duration of the effects would be
39 similar.

40 **4.4.5.9 Mitigation**

41 To further reduce impacts on bat, the following measures would be implemented:

42 MM BIO-5: Avian and Bat Protection Plan. An ABPP will be developed for the Proposed Project. The
43 ABPP will provide for pre-construction surveys, post-construction monitoring, and adaptive management
44 measures. During preconstruction surveys, biological monitors will also look for bird nests within the

1 Proposed Project area. If an active nest is located, no construction activities will occur within 100 feet of
2 the nest. As it is not possible to quantify effects on bats and birds based on pre-project surveys, post-
3 construction monitoring will be implemented. Biological monitors will use USFWS survey methods and
4 mitigation measures presented in *Protecting Burrowing Owls at Construction Sites in Nevada's Mojave*
5 *Desert Region* (USFWS no date specified) The ABPP will define thresholds of adverse effects; for every
6 threshold that is exceeded, a mitigation strategy will be employed.

7 **4.4.5.10 Residual Impacts on Bats**

8 Residual effects on bats would be the same as the residual effects for other wildlife species.

9 **4.4.5.11 Migratory Birds - Direct and Indirect Effects by Alternative**

10 **No Action Alternative**

11 Under the No Action Alternative, the ROW application would be denied and the Proposed Project would
12 not be built; therefore, no project related effects on migratory birds would occur.

13 **Proposed Action - 96 WTG Layout Alternative**

14 Construction. Raptors and non-raptors would be directly affected because the Proposed Project would
15 remove approximately 160 acres of potential foraging habitat for raptors and nesting and foraging habitat
16 for non-raptor species. An additional 249 acres may be temporarily affected during construction activities,
17 but would be reclaimed. It is unlikely that construction grading and clearing activities would result in
18 bird injury or death because most birds can flee the area; however, eggs, nests, and juveniles would be
19 more susceptible to adverse effects. A few species such as burrowing owls might be more susceptible to
20 injury or death during grading activities because they might not flee from their burrows and could become
21 entombed.

22 Similar to effects on wildlife, increased vehicle traffic could result in injury or death to birds in the
23 Proposed Project area. However, birds are highly mobile and routinely avoid vehicle traffic, so bird
24 injury or mortality from vehicular collisions are expected to be minimal.

25 Increased noise during construction activities could result in birds, particularly non-raptors, avoiding the
26 area and therefore result in a change of migration or breeding patterns.

27 Construction of Western's proposed switching station would have similar effects to migratory birds as
28 those discussed above. The switching station would permanently remove 3.5 acres of foraging habitat for
29 raptors and nesting and foraging habitat for non-raptor species.

30 O&M and Decommissioning. During operation of the facility, non-raptors and raptors might collide with
31 wind turbine rotors or transmission lines, resulting in injury or death. The typical bird community in the
32 Proposed Project area exhibited relatively little change over the 2 years of bird surveys and contains
33 species typical of the Mojave Desert. The community is comprised of three primary species: the black-
34 throated sparrow, Gambel's quail, and mourning dove. Species richness was higher in the spring
35 compared to the fall, but many of these species were detected on fewer than 5% of the surveys. For
36 example, in spring of 2009, a total of 55 species were observed, but 25 species were detected in less than
37 5% of the surveys. Thus, the Proposed Project area does not receive a large influx of breeding birds
38 during spring, and migrants pass through infrequently and in low numbers. The overall low mean use and
39 low encounter rates for all non-raptor species suggest that birds are not abundant and most fly below the
40 RSA. These results suggest a low likelihood of interactions with turbines and a low overall risk to birds.

41 When compared to raptor use data at other wind energy facilities, raptor use at the Proposed Project site
42 was relatively low. Additionally, no golden eagle nests were located within 4 miles of the Proposed
43 Project area. The level of raptor use in the Proposed Project area suggests that raptor mortality is
44 anticipated to be low (Young et al. 2003). Turkey vultures, red-tailed hawks and American kestrels were

1 the most common raptors observed in the Proposed Project area, and fatalities of each species have
2 occurred at wind farms (Thelander et al. 2003, Kerns and Kerlinger 2004, Erickson et al 2004, Anderson
3 et al. 2005, Kerlinger et al. 2006, Jain et al. 2007). However, the overall numbers of and encounter rates
4 for turkey vultures, red-tailed hawks, and American kestrels detected in the Proposed Project Area were
5 low, thereby minimizing the probability of negative interactions with turbines.

6 Birds, both raptors and non-raptors, would be susceptible to collisions with the Proposed Project's
7 overhead transmission lines and collector lines, which could result in electrocution, injury, or death.
8 However, transmission lines are designed with large separations between energized conductors; and
9 therefore pose bird lower electrocution risks than the lower voltage collector lines that have closer
10 spacing. (Avian Power Line Interaction Committee 2011). Larger raptors can be more susceptible to
11 electrocutions because their large wing-span might contact two transmission wires. Red-tailed hawks
12 were observed near the Proposed Project area roosting on transmission line towers. New transmission
13 line towers associated with the Proposed Project might attract red-tailed hawks to the project area, thus
14 making them more susceptible to collisions with turbines.

15 Bird-Switching Station interactions are possible and could result in electrocutions and injury or death.
16 Similar to power lines, the higher transmission voltage sections of substations are typically spaced with
17 adequate separation to protect large birds; however, lower voltage power lines within substations may
18 pose electrocution risks (Avian Power Line Interaction Committee 2011).

19 **87 WTG Layout Alternative**

20 Under the 87 WTG Layout Alternative, effects on migratory birds would be similar to those identified
21 under the 96 WTG Layout Alternative; however, nine less turbines are associated with this alternative
22 presenting less potential for bird / rotor collisions. However, the type, intensity, and duration of the
23 effects would be similar.

24 **4.4.5.12 Mitigation**

25 To further reduce impacts on migratory birds, the following measures would be implemented:

26 MM BIO-5: Avian and Bat Protection Plan. An ABPP will be developed for the Proposed Project. The
27 ABPP will provide for pre-construction surveys, post-construction monitoring, and adaptive management
28 measures. During preconstruction surveys, biological monitors will also look for bird nests within the
29 Proposed Project area. If an active nest is located, the proponent will notify BLM and/or NDOW to
30 determine an appropriate buffer distance for avian species found, typically at around 100 feet from the
31 nest. As it is not possible to quantify effects on bats and birds based on pre-project surveys, post-
32 construction monitoring will be implemented. The ABPP will define thresholds of adverse effects; for
33 every threshold that is exceeded, a mitigation strategy will be employed.

34 MMBIO-6: Burrowing Owl Protection During Construction: For burrowing owls, biological monitors
35 will use USFWS survey methods and mitigation measures presented in *Protecting Burrowing Owls at*
36 *Construction Sites in Nevada's Mojave Desert Region* (USFWS no date specified).

37 MM BIO-7: Transmission Line Design. All overhead power lines will be designed using the *Suggested*
38 *practices for Avian Protection on Power Lines: State of the Art in 2006 manual and Mitigating Bird*
39 *Collisions with Power Lines: The State of the Art in 1994.*

40 **4.4.5.13 Residual Effects – Migratory Birds**

41 Residual effects on migratory birds would be the same as the residual effects for other wildlife species.

1 **4.4.5.14 Game - Direct and Indirect Effects by Alternative**

2 **96 WTG Layout Alternative**

3 Construction, O&M, and Decommissioning. Although temporary in nature, noise and activity associated
4 with construction and decommissioning could cause game animals to avoid the area, thus altering their
5 normal behavior patterns. New structures, roads and increased human presence may affectively serve as a
6 barrier that suppresses or eliminates connectivity between populations of bighorn sheep in the Newberry
7 and Eldorado Mountains (NDOW 2011). However, the project would only occupy a small portion of the
8 available migratory corridor between these mountain ranges leaving some connectivity between the
9 ranges; therefore, the project effects are anticipated to be minimal.

10 No effects to game animals are anticipated during the construction, or operation of Western's proposed
11 switching station.

12 **87 WTG Layout Alternative**

13 Under the 87 WTG Layout Alternative, effects on game species would be similar to those identified under
14 the 96 WTG Layout Alternative; however, nine less turbines are associated with this alternative reducing
15 the potential impacts on game. However, the type, intensity, and duration of the effects would be similar.

16 **4.4.5.15 Mitigation Measures**

17 MM BIO-8: Terrestrial Mitigation Plan. The Applicant is developing a Terrestrial Wildlife Plan, which
18 would provide for incidental bighorn sheep post-construction monitoring and adaptive management
19 measures, should they be required. If, in the future it can be determined that facility O&M is impacting
20 north-south movements of bighorn sheep through a movement corridor, mitigation measures will need to
21 be determined and implemented. The Terrestrial Wildlife-Plan will define thresholds of adverse effects;
22 for every threshold that is exceeded, a mitigation strategy will be developed and employed.

23 **4.4.5.16 Residual Effects – Game**

24 Residual effects on game would be the same as the residual effects for other wildlife species.

4.5 Cultural Impacts

The National Historic Preservation Act (NHPA), as amended in 1992 (16 USC 40 et seq.) requires government agencies to take into account the effects of their actions on properties listed or eligible for listing on the NRHP. The process begins with the identification and evaluation of cultural resources for NRHP eligibility, followed by an assessment of effect on these eligible resources, and through a consultation process with the State Historic Preservation Office (SHPO), Native Americans, and other interested parties.

4.5.1 Indicators

Impacts to cultural resources were assessed in terms of the duration, intensity, and type as discussed below.

Duration. Any change to the physical attributes of historic property is considered long-term and of permanent duration.

Intensity. The description of the intensity of an impact to a cultural resource is limited to whether the impact is deemed an adverse effect or no adverse effect, as defined in the implementing regulations (36 CFR Part 800) for Section 106 of the NHPA. An adverse effect would be considered a major impact under NEPA. The guidelines for adverse/no adverse effect thresholds are shown in Table 4-1.

Table 4.5-1. Intensity of Environmental Consequences on Cultural Resources

Impact Intensity	Definition of Intensity
No Adverse Effect	There are no adverse effects if no historic property is present or the action will have no effect on historic properties. If an impact results in no alterations to the characteristics of a historic property which qualify it for inclusion or eligibility to the NRHP, the action is considered to have no adverse effect. For archeological investigations, measures approved by BLM, cooperating agencies, and the Nevada SHPO must be implemented to avoid or minimize effects to be considered no adverse effect. If no agreement among the above parties can be reached, the effect would remain adverse.
Adverse Effect	An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association (NHPA 36 CFR 800.5(a)(1)).

Type. Under NHPA, unlike NEPA, only adverse impacts are taken into consideration. Adverse impacts to archeological resources include changes in visitor use patterns that increase access to sites, unauthorized artifact collection, vandalism, soil compaction, and ground disturbance within area site (e.g., earth-moving activities or increased erosion).

4.5.2 Direct and Indirect Effects by Alternative

This section describes the effects under each alternative as prescribed under NEPA. To compare effects, this analysis defines the temporal scale (time), spatial extent (area), and intensity of effects for each alternative.

1 **4.5.2.1 No Action Alternative**

2 Under the No Action Alternative, the ROW applications would be denied and the Proposed Project and
3 Western’s proposed switching station would not be built; therefore, no project related effects on cultural
4 resources would occur.

5 **4.5.2.2 96 WTG Layout Alternative**

6 Construction and use of the proposed WTGs and associated access roads will have direct and indirect
7 adverse effects on sites that are eligible for NRHP listing. Direct impacts include those related to
8 construction, road grading, and other actions that will occur as the facilities are built. Indirect impacts are
9 those that result from increased visitation to the area, affecting sites both within the project area and
10 nearby. Increased visitation impacts include more people walking over sites and either knowingly or
11 unknowingly affecting sites.

12 Two prehistoric and three historic sites could be impacted by the project activities. Different intensities of
13 impacts were demonstrated in the five sites. Site 26CK3635 is near a road and increased access may cause
14 indirect impacts. However, this site can be avoided. Site 26CK9262 is a site recommended eligible for
15 listing on the NRHP, and elements of it could be impacted through road improvements. This site could
16 potentially be avoided through project design. Site 26CK9262 is recommended eligible for the NRHP and
17 could potentially be avoided through project design and or mitigation measures. Site 26CK7718 is
18 recommended eligible for NRHP listing but it appears that the project activities would not directly affect
19 any features of the site that contribute to its eligibility. Road improvements could cause indirect effects.
20 Numerous areas within Site 26C7654 would be directly affected by the Proposed Project activities. If
21 construction of some project elements cannot be deleted or relocated, than mitigation of the impacts
22 would need to be conducted. The duration of all of the unmitigated impacts is considered to be the
23 lifetime of the Proposed Project.

24 Construction and use of Western’s proposed switching station would not have any direct and indirect
25 adverse effects to cultural resources sites that are eligible for NRHP listing.

26 **4.5.2.3 87 WTG Layout Alternative**

27 Effects under the 87 WTG Layout Alternative would be the same to those identified under the 96 WTG
28 Layout Alternative.

29 **4.5.3 Mitigation**

30 As described above, various kinds and levels of adverse effects are expected. Table 4.5-2 describes the
31 impacts and types of mitigation recommended for the five sites recommended eligible for listing on the
32 NRHP.

Table 4.5-2. Types of Impacts and Recommended Mitigation Measures

Site	Type of Impact	Intensity	Duration if Unmitigated	Mitigation Options
26CK3635	Indirect	Low	Length of Project	Avoid and Monitor
26CK7654	Direct	High	Length of Project	Avoid or Mitigate
26CK7718	Indirect	Low	Length of Project	Monitor During Construction
26CK9262	Direct	Moderate	Length of Project	Avoid or Mitigate
26CK9294	Direct	High	Length of Project	Avoid or Mitigate Through Literature Review, Surface Collection and/or Excavations

1 In order to implement the mitigation measures described above the following measures are considered
2 necessary first steps:

- 3 • Consultations between the proponent and the agencies to determine if some project elements can
4 be rerouted or not constructed.
- 5 • Development of a Treatment Plan for each eligible site describing in detail how the impacts
6 would be mitigated
- 7 • Development of a Memorandum of Agreement outlining all of the affected parties roles and
8 responsibilities including the Treatment Plans

9 The Memorandum of Agreement would need to be completed prior to the signing of the Record of
10 Decision for this EIS. The mitigation measures would need to be completed prior to a BLM Notice to
11 Proceed for project construction is authorized.

12 **4.5.4 Residual Effects**

13 The Proposed Project would not have any residual impacts on cultural resources relative to the criterion
14 outlined in this section.

4.6 Air Quality Impacts

This section discusses effects of the Proposed Project on existing air quality and climate that might occur with implementation of the Proposed Action, alternatives, or Western's proposed switching station.

The wind energy generation portion of the Proposed Project has an expected life of 30 years, with construction projected to occur over 8 to 12 months. It is anticipated that there would be long-term and short-term impacts on air quality due to emissions associated with project construction, O&M, and decommissioning. Air emissions associated with the Proposed Project including Western's proposed switching station would be primarily short term and chiefly associated with engine exhaust from the combustion of fossil fuels in construction equipment and fugitive dust during construction. Relatively less significant contributions to air emissions would be generated from on-road travel of vehicles for worker commutes and delivery of materials and equipment to the Proposed Project site. Estimates of vehicle types, vehicle numbers, and vehicle trips during construction, O&M, and decommissioning used to calculate emissions associated with the Proposed Project are based on industry standards established for the construction, O&M, and decommissioning of similar wind energy facilities.

Wind energy generation projects do not involve the combustion of fuels to generate electricity, so there would be no air quality impacts from the generation of power. In addition, there would be no large combustion sources on site. O&M emissions would be produced by the vehicles used by an estimated 15 workers commuting daily to the site, some onsite vehicles (such as pickup trucks and flatbed trucks), and small-scale comfort heating and cooling needs for the O&M building.

It is expected that a similar scale of air emissions for construction would occur during the Proposed Project's decommissioning. The activities involved in the facility closure would depend on the expected future use of the site. Therefore, the extent of site closure activities would be determined at the time of the closure. A conservative estimate of the air emissions associated with decommissioning would be similar to those present for the construction phase of the Proposed Project.

4.6.1 Indicators

The Proposed Project would affect air quality if it:

- Conflicts with or obstruct implementation of an applicable air quality plan;
- Violates any air quality standard or contribute substantially to an existing or projected air quality violation;
- Exposes sensitive receptors to substantial pollutant concentrations;
- Increases ambient pollutant concentrations from below to above any NAAQS;
- Contributes to an existing violation of any NAAQS;
- Impairs visibility within federally mandated PSD Class I areas, or
- Results in non-conformance with the CAA or any State Implementation Plan.

Clean Air Act Conformity

The CAA of 1990 requires federal agencies to ensure their actions conform to the CAA's requirements and federally enforceable plans, including state implementation plans. The conformity assessment process ensures that federal agency actions would not cause or significantly contribute to an exceedance of ambient air quality standards, and would not delay timely progress toward compliance with ambient air quality standards in areas where they are not currently being met.

1 Project construction impacts would be temporary in nature and minor to moderate in magnitude. Those
2 emissions would not be sufficient to cause any new violations of ambient air quality standards, or to
3 significantly contribute to CO levels.

4 Direct project operational impacts on air quality would be minimal and not adversely affect compliance
5 with air quality standards in the Proposed Project area. Indirectly, the Proposed Project would enhance
6 regional air quality by supporting practical delivery of renewable energy onto the local energy grid.

7 **Climate Change/Greenhouse Gases**

8 The environmental analysis and documents produced during the NEPA process should provide the
9 decision maker with relevant and timely information about the environmental effects of the decision and
10 reasonable alternatives to mitigate these impacts. In this context, climate change issues arise in relation to
11 the consideration of (1) the effects of GHG emissions from a Proposed Action and alternative actions and
12 (2) the relationship of climate change effects on a Proposed Action or alternatives, including the
13 relationship to proposal design, environmental impacts, mitigation, and adaptation measures. Effects of
14 GHG emissions and climate change from each alternative are presented in the analysis in Section 4.6.2.
15 GHG impacts from the Proposed Project would affect the environment if they would:

- 16 • Help or hinder attainment of the state's goals of reducing GHG emissions (Nevada Climate
17 Change Advisory Committee [NCCAC] 2008);
- 18 • Increase the consumption of energy resources, especially fossil fuels;
- 19 • Generate GHG emissions, either directly or indirectly, that might have a significant impact on the
20 environment; or
- 21 • Conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of
22 reducing the emissions of GHGs.

23 **4.6.2 Direct and Indirect Effects to Air Quality by Alternative**

24 This section describes the effects under each alternative using the respective methodology prescribed
25 under NEPA. To compare effects, this analysis defines the temporal scale (time), spatial extent (area), and
26 intensity of effects for each alternative.

27 **4.6.2.1 No Action Alternative**

28 Under the No Action Alternative, the ROW application would be denied and the Proposed Project would
29 not be built; therefore, no project related effects on air quality would occur..

30 **4.6.2.2 Proposed Action – 96 WTG Layout Alternative**

31 Under the 96 WTG Layout Alternative, the BLM would approve the ROW applications and the Proposed
32 Action would proceed. Effects that could result from the implementation of the Proposed Action during
33 construction, O&M, or decommissioning activities are analyzed in this section. Under this alternative,
34 249 acres would be temporarily disturbed and 160 acres would be permanently disturbed in the Proposed
35 Project area. The Applicant has incorporated the following measures to avoid and minimize impacts on
36 air quality and climate within the project area:

- 37 • APM-1 Erosion Control
- 38 • APM-2 Excavation/Grading
- 39 • APM-3 Air/Dust Control
- 40 • APM-4 SWPP
- 41 • APM-5 SPCC Plan
- 42 • APM-6 Health and Safety Program

- 1 • APM-8 Waste Management Plan
- 2 • APM-9 Weed Control Plan
- 3 • APM-10 Site Rehabilitation Plan and Facility Decommissioning Plan

4 Additionally under the Proposed Action, the BLM would authorize Western to construct, operate, and
 5 maintain the proposed switching station. For construction of Western’s proposed switching station,
 6 Western requires the construction contractor to obtain the appropriate construction related permits.
 7 Additionally, Western will require the construction contractor to incorporate specific provisions
 8 addressing prevention of air pollution in Western’s Construction Standard 13, specifically the following
 9 sections:

- 10 • 13.3 Landscape Preservation
- 11 • 13.5 Noxious Weed Control
- 12 • 13.13 Prevention of Air Pollution

13 Air Pollutant Emissions

14 Construction. Construction of the Proposed Project would take approximately 8 to 12 months and would
 15 generate emissions of CO, CO₂, NO_x, VOCs, SO₂, particulate matter with a mean aerodynamic diameter
 16 of 10 micrometers or less (PM₁₀), and particulate matter with a mean aerodynamic diameter of 2.5
 17 micrometers or less (PM_{2.5}). Ozone (O₃) is not emitted directly from emission sources, but is created in
 18 the atmosphere via a chemical reaction between NO_x and VOCs in the presence of sunlight; these
 19 compounds are referred to as ozone precursors. Table 4.6-1 presents estimates of total emissions during
 20 construction, both as a yearly average as well as total emissions from all construction activities. Actual
 21 emissions can be reasonably expected to be lower than the emissions listed in this table.

22 **Table 4.6-1. Criteria Air Pollution Emissions (Tons/Year) Over the 8 to 12 Month**
 23 **Proposed Project Construction Duration of the 96 WTG Alternative**

Source	CO	CO ₂	NO _x	VOC	SO ₂	PM ₁₀	PM _{2.5}
WTG and site construction	47	9,651	60	8.8	0.10	95	16
Transmission line construction	6.3	1,950	16	1.9	0.02	11	1.9
TOTAL	53.3	11,601	76	10.7	0.12	106	17.9

CO = carbon monoxide; CO₂ = carbon dioxide; NO_x = nitrogen oxides; PM₁₀ = particulate matter with a mean aerodynamic diameter of 10 micrometers or less; PM_{2.5} = particulate matter with a mean aerodynamic diameter of 2.5 micrometers or less; SO₂ = sulfur dioxide; VOCs = volatile organic compounds

24 The construction activities would generate air pollutant emissions. Sources of dust emissions would
 25 include the earth work for WTG foundations, substations, Western’s proposed switching station, O&M
 26 building, laydown yards, communications and transmission line structures, and access roads; wind
 27 erosion from those areas where vegetation would be removed; active earth-moving or ground-breaking
 28 activities, including digging and ground contouring; activities associated with setting foundations for the
 29 WTGs, substation structures, switching station, O&M building, O&M septic system, and transmission
 30 line structures; construction traffic on unpaved roads; and potentially tracked-out soil material
 31 resuspended by paved road traffic. A temporary cement batch plant, rock crusher, and construction
 32 operation trailer pad would also be located on site. In addition, heavy equipment and worker vehicles
 33 would be a source of exhaust emissions during the construction of the Proposed Project.

34 Exhaust and fugitive dust emissions generated from construction equipment and vehicles would increase
 35 ambient concentrations of air pollutants, but are not expected to contribute to regional exceedances of
 36 NAAQS criteria air pollutants, for which the area has been designated as nonattainment by the EPA for
 37 O₃. The temporary air quality impacts associated with construction would end immediately after
 38 construction.

1 Under the 96 WTG Alternative, the yearly construction emissions totals for NO_x, CO, and PM₁₀ would be
 2 greater than the *de minimis* thresholds as specified under the federal General Conformity Rule (40 CFR
 3 93); thus, project-related emissions would not conform to state implementation plans (SIPs) and the
 4 regional air quality plans. In addition, any approved construction or new significant source of stationary
 5 (point) air pollution in Clark County would be required by the Clark County DAQEM to adhere to the
 6 prescribed BMPs and control measures to minimize dust emissions and control engine exhaust emissions.

7 Estimated emissions of criteria air pollutants during the construction process are listed in Table 4.6-1. The
 8 estimate of dust from exposed ground calculations is very conservatively assumed that half of all project
 9 areas could be exposed at any one time. Implementation of APM-3 would minimize those emissions.

10 Reclamation or construction areas would reduce the acreage of exposed (i.e., not vegetated) ground in the
 11 Proposed Project area to access roads, plus two graveled acres at the two proposed substations. The total
 12 construction impact area for all project features would be approximately 409 acres. Following the
 13 reclamation of 249 acres of construction impacts areas, the total acreage with permanently disturbed
 14 ground surfaces potentially opened to wind erosion would be approximately 160 acres. Isolated impacts
 15 from dust could persist near the remaining areas where WTGs, access roads, and transmission lines would
 16 result in soil disturbances. Implementation of APM-3 would minimize those emissions.

17 At Western's proposed switching station about half of the 7 acre site will be graveled (3.5 acres) and the
 18 other half will be reclaimed (2.5 acres). For construction of the switching station the Western will require
 19 the construction contractor to incorporate specific provisions addressing prevention of air pollution in
 20 Western's Construction Standard 13.

21 O&M and Decommissioning. Estimated annual operations emissions for criteria air pollutants and GHGs
 22 are listed in Table 4.6-2. These estimates are based upon the assumption of 75.2 miles of round trip gravel
 23 road travel for maintenance surveys and routine maintenance, and heavy equipment maintenance activity
 24 at up to one-tenth the activity level anticipated during construction.

25 **Table 4.6-2 Criteria Air Pollutant Emissions (Tons/Year) During the Proposed Project**
 26 **O&M Duration of the 96 WTG Alternative**

Source	CO	CO ₂	NO _x	VOC	SO ₂	PM ₁₀	PM _{2.5}
Emissions generated by maintenance and operation site traffic	1.7	223	0.16	0.18	0.002	1.2	0.19
Windblown dust from exposed ground	--	--	--	--	--	15.1	2.27
TOTAL	1.7	222	0.16	0.18	0.002	16.3	2.46

CO = carbon monoxide; CO₂ = carbon dioxide ; NO_x = nitrogen oxides; PM₁₀ = particulate matter with a mean aerodynamic diameter of 10 micrometers or less; PM_{2.5} = particulate matter with a mean aerodynamic diameter of 2.5 micrometers or less; SO₂ = sulfur dioxide; VOCs = volatile organic compounds

27 Ongoing emissions associated with O&M of the Proposed Project would be attributable to mobile
 28 combustion emissions from worker commutes and delivery trips, as well as limited fugitive dust from
 29 inspection, and O&M vehicles traveling on unpaved roads and from areas with disturbed soils, such as the
 30 laydown area and substations. Other sources of ongoing emissions would include corona activity on
 31 electrical elements in open air, which could produce limited amounts of gaseous O₃ or NO_x, and SF₆ that
 32 would be used as a gaseous dielectric medium in the gas breakers proposed for the switching station and
 33 substations. SF₆ releases would be limited based upon Western's handling and monitoring practices.
 34 Table 4.6-2 lists the maximum annual criteria air pollutant emissions anticipated during the O&M phase.

1 The Proposed Project would require an operational workforce of up to 15 full-time employees. This
2 workforce would include administrative and management personnel, operators, and security and
3 maintenance personnel. O&M would require the use of vehicles and equipment, including trucks for
4 onsite WTG and substation maintenance, refueling, and lubricating, and crane trucks for WTG elevated
5 equipment maintenance/replacement. Pickup trucks would be in daily use on the Proposed Project site,
6 with occasional use of flatbed or other types of medium-duty trucks as needed.

7 Ground disturbance along the access roads would be subject to wind erosion. Maintenance surveys would
8 be expected to result in dust and exhaust emissions from routine checks by vehicles along that linear
9 access road and at the project substation components. Maintenance would be performed as necessary,
10 resulting in emissions types like those described during the construction phase. Maintenance efforts
11 would be intermittent, generally of short duration, and would not approach the level of activity described
12 during the construction phase. As the access road to Western's proposed switching station would be
13 graveled long term particulate and dust impacts from vehicle use during operations would be minimized.

14 It is anticipated that during decommissioning, a similar scale of effort and resultant emissions would
15 occur as with the construction phase and, therefore, there would not be a significant impact on air quality
16 during the decommissioning phase of the Proposed Action.

17 **GHG Emissions**

18 Construction. Climate change analyses are comprised of several factors, such as GHG emissions, land use
19 management practices, and the albedo effect (i.e., the reflecting power of a surface). The tools necessary
20 to quantify specific climatic impacts of those factors are presently unavailable. As a consequence, impact
21 assessment of specific effects of anthropogenic activities cannot be determined. Additionally, specific
22 levels of significance have not yet been established. Therefore, climate change analysis for the purpose of
23 this document is limited to accounting and disclosing of factors that have been identified to contribute to
24 climate change. Qualitative evaluation of potential contributing factors is included where appropriate and
25 practicable. GHG emissions are estimated with and without the Proposed Action and alternatives. An
26 increase in unsequestered GHG emissions would lead to incrementally increased GHG concentrations in
27 the atmosphere. This in turn would contribute to further manifestations of climate change.

28 The Proposed Project would emit GHGs during the construction phase, which could last 8 to 12 months,
29 primarily from the exhaust of equipment and transportation of employees and materials to and from the
30 site. Table 4.6-1 provides an estimate of cumulative CO₂ emissions associated with the construction
31 phase. These would be one-time emissions, which would cease when the construction phase is completed.

32 O&M and Decommissioning. The O&M phase would include minimal SF₆ loss from Western's circuit
33 breakers, based on Western's handling and monitoring practices.. O&M activities would include
34 vehicular travel and maintenance activities that would release GHGs. Table 4.6-2 provides an estimate of
35 annual CO₂ emissions estimated per year for the O&M phase of the project. The CO₂ emission
36 calculations assume approximately 346,320 miles per year of paved road travel, approximately 56,004
37 miles per year of unpaved road travel, and O&M activity at one-tenth of the level during the project's
38 construction phase. Decommissioning phase GHG emissions are expected to be on a similar scale as
39 construction GHG emissions. GHG emissions during decommissioning could be reduced by
40 implementation of MM AIR-2, 3, 4, 5 and 7. GHG emissions could be mitigated by removal and
41 recycling of CF₆ from Western's electrical equipment during decommissioning of Western's proposed
42 switching station .Although not quantified due to the speculative nature of GHG emissions impacts, long-
43 term generation of renewable electricity could have ongoing, long-term air quality and climate benefits,
44 including potential avoidance of GHG emissions associated with electricity production from traditional
45 fossil fuel resources. The Proposed Action's potential to produce GHG emission-free renewable energy
46 represents an air quality and climate mitigation measure.

1 **GHG Emissions and Contribution to Global Warming**

2 This section considers detailed information about the potential for construction, operation and
 3 maintenance, and decommissioning related activities to emit GHGs and contribute to global warming.
 4 GHG emissions are quantified in Tables 4.6-3 and 4.6-4. Agencies under the U.S. Department of the
 5 Interior are required to consider potential impact areas associated with climate change, including potential
 6 changes in flood risk, water supply, sea level rise, wildlife habitat and migratory patterns, invasion of
 7 exotic species, and potential increases in wildfires.

8 Construction: Construction of the proposed project will involve coordination of numerous personnel and
 9 equipment. Construction activities would result in short-term, unavoidable increases in vehicle and
 10 equipment emissions, including GHGs. The GHG emissions estimate for construction is provided in
 11 Table 4.6-3.

12 **Table 4.6-3. Construction Related GHG Emissions (Tons) for 96 WTG Layout Alternative**

Source	CO ₂ - Equivalent
WTG and site construction	28,200
Transmission line construction	6,700
TOTAL	34,900

13 In addition to direct emissions of GHGs, construction of the 96 WGT layout would permanently disturb
 14 159 acres of land and completely remove vegetation. This would reduce the ongoing natural carbon
 15 uptake by vegetation. A study of the Mojave Desert indicated that the desert may uptake carbon in
 16 amounts as high as 100 grams per square meter per year (Wohlfahrt et. al. 2008). This would equate to a
 17 maximum reduction in carbon uptake, calculated as CO₂ of 1.48 metric tons of CO₂ per acre per year for
 18 areas with complete vegetation removal. The equivalent loss in carbon uptake for the 96 WGT layout
 19 would be about 235 metric tons per year (258 tons/year).

20 Operations and Maintenance. Electricity generation GHG emissions are generally dominated by CO₂
 21 emissions from carbon-based fuels. For this wind energy project the primary fuel is wind that is GHG-
 22 free. However, gasoline and diesel fuel would be used in maintenance vehicle, staff and employee
 23 vehicles. SF₆ emissions from Western's circuit breakers would be minimal. The GHG emissions estimate
 24 for operations and maintenance is provided in Table 4.6-4.

25 **Table 4.6-4. O & M Related GHG Emissions (Tons/Year)for the 96 WTG Layout Alternative**

Source	CO ₂ - Equivalent
Maintenance, staff and employee vehicles	273
TOTAL	273

26 Decommissioning. Decommissioning related activities would emit GHGs when the facility is dismantled
 27 and the site is reclaimed and revegetated. It is anticipated that such emissions would be caused by
 28 operation of construction equipment and motor vehicles; related impacts would be a one-time, limited
 29 duration event. Project specific contributions to global climate change during the decommissioning phase
 30 are evaluated using the same methods as initial construction emissions, and are anticipated to be
 31 comparable in type and magnitude, but likely to be lower than the construction emissions discussed
 32 above.

33 Hydrologic Resources: In Nevada and much of the western U.S., climate change is expected to result in
 34 several potential effects related to water resources. These include potential sea level rise, potential
 35 changes in the frequency of flooding and droughts, and potential reductions in surface water supply.

1 **Sea Level Rise:** Sea level rise is expected to occur as a result of increased global temperatures. Increased
2 global temperatures include increases in ocean temperature, as well as air temperature. As water
3 temperature increases, the water contained in the world's oceans would undergo thermal expansion.
4 Increase temperatures could also result in a net melting and reduction in the polar ice sheets. These effects
5 could result in an increase in the level of the world's oceans. However, these potential effects are not
6 expected to affect the Proposed Project site, which is located approximately 200 miles from the Pacific
7 Ocean, and at an elevation of at least 3,000 feet above mean sea level. The proposed SWEP project would
8 not be affected by sea level rise.

9 **Snowpack and Snowmelt Period:** Changes in snowpack and snowmelt period are anticipated in Nevada
10 and the Colorado River watershed as a result of climate change. Climate change is expected to result in
11 generally warmer temperatures, which would result in a greater proportion of total annual precipitation
12 falling as rain. Snowpack in the Colorado River watershed serves as a temporary means of water storage
13 with water releases slowly during snowmelt. If a greater proportion of precipitation falls as rain, the
14 snowpack would be lessened, and the potential for storage in the snowpack would be lessened. Warmer
15 temperatures would cause earlier snowmelt events, potentially reducing the ability of water managers to
16 capture snowmelt in reservoirs. However, there is no snowpack in the vicinity of the Proposed Project,
17 and the SEEP is not dependent upon snowmelt water for water supply. Therefore, the proposed SWEP
18 project would not be affected by potential changes in snowpack characteristics.

19 **Dilution:** Dilution refers to the amount of water that is available in a receiving body into which
20 wastewater is discharged. Under some circumstances, climate change could result in a change in the
21 volume or timing of water flows that are available in a stream for dilution of wastewater. The proposed
22 SWEP project would not discharge wastewater into surface waters. Therefore, potential climate related
23 changes in dilution capacity would not affect the Proposed Project.

24 **Water Temperature:** Water temperature can be critical to fisheries resources. The site and vicinity do
25 not contain any perennial waterways that could support fisheries. The Proposed Project would rely on
26 water supply from the local public water utility, which obtains its supply from public groundwater wells,
27 and the temperature of the groundwater would not be critical to the SWEP operation. The Proposed
28 Project would not result in water discharge or other activity that would affect water temperature along the
29 Colorado River. No component of the Proposed Project would alter reservoir flows or otherwise change
30 water management operations such that water temperature would be altered. Potential changes in water
31 temperature would not affect the SWEP project.

32 **Flooding, Drainage, and Erosion:** Climate change is anticipated to affect the frequency and intensity of
33 extreme weather events, including large storm events and droughts, in the western U.S. watersheds
34 including the Colorado River. The degree of change is uncertain, most likely the Colorado River
35 watershed would experience an increase in the frequency and intensity of rainfall/flood events. This could
36 result in an increase in potential stormwater runoff and flooding, an increase in erosion and sedimentation
37 on site and downstream of the site. Increase in the frequency and intensity of droughts are discussed under
38 water availability within this section. Impacts from erosion would be mitigated through the
39 implementation of MMs 1-5 and APM-9. Erosion from flooding and drainage would be mitigated by
40 implementing APM-10 and regarding roads and revegetation of disturbed areas following
41 decommissioning of the facility.

42 **Water Resources Availability:** The site is located within the watershed to the lower Colorado River and
43 some drainages on the site drain to the Colorado River. Surface waters at the subject site occur only
44 during intense precipitation events, where surface water runoff occurs. There are no perennial streams or
45 other waterways located on the site, and the Proposed Project would not rely on surface water for water

1 supply during construction of operations. The Proposed Project would rely upon water from the public
2 water utility which obtains water from public water wells near Searchlight.

3 In the event that climate change results in reduce precipitation within the project area some degree of
4 associated recharge reduction in groundwater recharge from rainfall would occur. This would not result in
5 increased water requirements for the Proposed Project, and would not result in increased use of water
6 from the public water utility for construction or operations or maintenance. No increase in groundwater
7 pumping would be required as a result of the effects of climate change.

8 If climate change does result in reduced recharge to the groundwater basin that supplies the public water
9 utility there could be effects on groundwater levels. The use of water from the public water utility for
10 construction and operations and maintenance could have an effect on water levels which could be further
11 impacted by reduction in groundwater recharge due to climate change.

12 **Wildfire Risks:** Climate change would result in a small but general increase in temperature and could
13 also increase the frequency of extreme weather events that could generate wildfires, such as increased
14 frequency of drought and heat waves. Although the risk of wildfire that could affect the site could
15 increase as a result of climate change, these potential increases in risk are expected to be offset by
16 ongoing compliance with the worker safety and fire protection regulations including mitigation measure
17 MM SAFE-4.

18 **Heat Waves:** The frequency and occurrence and severity of heat waves could increase as a result of
19 climate change. Heat waves could result in increased potential risk to SWEP employees. Such risks would
20 be mitigated by implementation of MM SAFE-3 during construction, operations and maintenance and
21 decommissioning. This measure would require implementation of a health and safety plan to protect
22 workers against the effect of heat related hazards. Although the frequency and intensity of head wave
23 events could increase as a result of future climate change, the heat stress protection plan would provide
24 for worker safety in accordance with State and Federal requirements.

25 **Soil Moisture:** Climate change could result in increases in extreme weather events, including droughts
26 and heat waves, and an overall reduction in precipitation. These conditions could result in a reduction in
27 soil moisture content at the site and regionally. Reduction in soil moisture content would not affect the
28 SWEP operations and would not require any change in water resource usage. The Proposed Project would
29 not contribute to reductions in soil moisture.

30 **Fugitive Dust:** During construction, operations and maintenance, and decommissioning fugitive dust
31 emissions would require mitigation to be compliant with federal, state and county regulations. Fugitive
32 dust would be mitigated by implementation of the requirements of the Clark County DAQEM for dust
33 control and APM-3. The soils at the site have a very low natural soil moisture content as a result of low
34 rainfall and high evaporation rates of the desert environment of southern Nevada. Any potential further
35 reductions in soil moisture associated with climate change are not anticipated to result in a substantial
36 increase in fugitive dust emissions. The proposed mitigation measures would be sufficient to meet federal,
37 state and county regulations regarding fugitive dust.

38 **4.6.2.3 87 WTG Layout Alternative**

39 **Construction.** For the 87 WTG Layout, effects to air quality would be similar to those associated with the
40 96 WTG Layout; however, the area of disturbance is slightly less therefore the impacts to air quality may
41 be slightly reduced under this alternative. Table 4.6-5 presents estimates of total emissions during
42 construction, both as a yearly average as well as total emissions from all construction activities. Actual
43 emissions can be reasonably expected to be lower than the emissions listed in this table.

Table 4.6-5. Criteria Air Pollution Emissions (Tons/Year) Over the 8 to 12 Month Proposed Project Construction Duration for the 87 WTG Layout Alternative

Source	CO	CO ₂	NO _x	VOC	SO ₂	PM ₁₀	PM _{2.5}
WTG and site construction	44	9,077	58	8.4	0.10	86	15
Transmission line construction	6.3	1,950	16	1.9	0.02	11	1.9
TOTAL	50	11,027	74	10.3	0.12	97	17

CO = carbon monoxide; CO₂ = carbon dioxide; NO_x = nitrogen oxides; PM₁₀ = particulate matter with a mean aerodynamic diameter of 10 micrometers or less; PM_{2.5} = particulate matter with a mean aerodynamic diameter of 2.5 micrometers or less; SO₂ = sulfur dioxide; VOCs = volatile organic compounds

O&M. Estimated annual operations emissions for criteria air pollutants and GHGs are listed in Table 4.6-6. These estimates are based upon the assumption of 73.4 miles of roundtrip gravel road travel for maintenance surveys and routine maintenance, and heavy equipment maintenance activity at up to one-tenth the activity level anticipated during construction.

Table 4.6-6. Criteria Air Pollutant Emissions (Tons/Year) During the Proposed Project O&M Duration for the 87 WTG Layout Alternative

Source	CO	CO ₂	NO _x	VOC	SO ₂	PM ₁₀	PM _{2.5}
Emissions generated by maintenance and operation site traffic	1.7	222	0.16	0.18	0.002	1.2	0.19
Windblown dust from exposed ground	--	--	--	--	--	14.4	2.16
TOTAL	1.7	222	0.16	0.18	0.002	15.6	2.35

CO = carbon monoxide; CO₂ = carbon dioxide ; NO_x = nitrogen oxides; PM₁₀ = particulate matter with a mean aerodynamic diameter of 10 micrometers or less; PM_{2.5} = particulate matter with a mean aerodynamic diameter of 2.5 micrometers or less; SO₂ = sulfur dioxide; VOCs = volatile organic compounds

One substantial difference for the 87 WTG Layout is that the yearly construction emissions totals for NO_x, CO, and PM₁₀ would be less than the *de minimis* thresholds as specified under the federal General Conformity Rule (40 CFR 93); thus, project-related emissions are assumed to conform to SIPs and the regional air quality plans. In addition, any approved construction or new significant source of stationary (point) air pollution in Clark County would be required by the Clark County DAQEM to adhere to the prescribed BMPs and control measures to minimize dust emissions and control engine exhaust emissions

4.6.3 Mitigation

In addition to the aforementioned APMs to reduce impacts to air quality, the following mitigation measures would be implemented by the Applicant:

MM AIR-1: Secure all vehicles hauling loose materials. The Applicant will cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least 2 feet of freeboard, which is the distance from the top of the truck bed in the material being hauled.

MM AIR-2: Reduce vehicle emissions. The Applicant will turn off idling equipment when not in use.

MM AIR-3: Prohibit equipment tampering. The Applicant will prohibit any tampering with engines to increase horsepower, and require continuing adherence to manufacturer's recommendations.

MM AIR-4: Lease new equipment. If practicable, the Applicant will lease new, clean equipment that meet the most stringent of applicable federal or state standards.

1 MM AIR-5: Use low sulfur fuels. The Applicant will use and require contractors to use low-sulfur diesel
2 fuel (45 ppm) for vehicles and equipment, if available.

3 MM AIR-6: Avoid sensitive air quality receptors. The Applicant will locate diesel engines, motors,
4 and equipment as far as possible from possible sensitive receptors.

5 MM AIR-7: Mitigation of GHG Emissions. The Proposed Action would minimize GHG emissions
6 through the long-term generation of renewable electricity, which would provide a potential net benefit to
7 regional air quality.

8 **4.6.4 Residual Effects**

9 All air quality and climate impacts were assessed with consideration of all APMs, BMPs, MMs,
10 Construction Standards and other design features of the alternatives have been applied. Therefore, there
11 would be no difference between project impacts, as discussed above, and residual effects.

4.7 Transportation Impacts

This section discusses effects on transportation that may occur with implementation of the Proposed Action or alternatives.

4.7.1 Indicators

The Proposed Project would affect transportation levels if it:

- Causes an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system;
- Degrades existing road conditions as a result of construction;
- Prevents adequate emergency access;
- Causes loss of access to private land parcels; or
- Causes loss of access to historically important recreation access points or staging areas.

4.7.2 Direct and Indirect Effects by Alternative

This section describes the effects under each alternative using the respective methodology prescribed under NEPA. To compare effects, this analysis defines the temporal scale (time), spatial extent (area), and intensity of effects for each alternative. All effects discussed in this section are direct. No indirect effects on transportation were identified and potential indirect effects on other resources resulting from increased ease of access are discussed in those sections (e.g., Biological Resources, Cultural Resources, Recreation, etc.).

Effects may arise from physical changes to roads, closures and reroutes, construction activity, introduction of construction- or O&M-related traffic on local roads, or changes in daily or peak-hour traffic volumes created by either direct or indirect workforce changes in the area.

4.7.2.1 No Action Alternative

Under the No Action Alternative, the ROW application would be denied and the Proposed Project would not be built; therefore, no project related effects on transportation would occur.

4.7.2.2 Proposed Action – 96 WTG Layout Alternative

Under the 96 WTG Layout Alternative, the BLM would approve the ROW application and the Proposed Action would be carried forward. Effects that could result from the implementation of the Proposed Action during construction, O&M, or decommissioning activities are analyzed in this section. The Applicant has incorporated the following measures (see Table 2.6) to avoid and minimize impacts on transportation of the Proposed Project area:

- APM-3 Air/Dust Control
- APM-4 SWPP
- APM-6 Health and Safety Plan
- APM-7 Emergency Response Plan
- APM-10 Site Rehabilitation Plan and Facility Decommissioning Plan
- APM-14 General Design and Construction Standards

Additionally under the Proposed Action, the BLM would authorize Western to construct, operate, and maintain the proposed switching station. Western will require the construction contractor to comply with Environmental Construction Standard 13 for construction of Western's proposed switching station.

Construction. Construction of the project roads, facilities, overhead transmission lines, and electrical/communication lines would occur at the same time. Regional and local access to the area would be by way of US-95 and Cottonwood Cove Road. Access to project facilities would be provided by newly

1 constructed extensions of existing roads, and upgraded existing roads. These roads extend from portions
2 of US-95 and Cottonwood Cove Road. The truck traffic and truck trips associated with the transport of
3 equipment to the Proposed Project area would increase traffic on US-95 and Cottonwood Cove Road,
4 which might result in temporary moderate impacts on motorized travel if traffic flow problems or traffic
5 delays were to occur.

6 Construction of the Proposed Action would result in a short-term increase in traffic volume of a
7 maximum of 9,931 trips over the 8- to 12-month construction period. Workers and construction
8 equipment deliveries would use US-95 and Cottonwood Cove Road as the primary access route to the
9 project site. Some short-term delays may occur as a result of over-dimension loads once off the main
10 transport corridors.

11 Access and opportunities for motorized travel on local arterial roadways within the project area during the
12 construction of roads, laydown areas, substations, MET towers, WTGs, facilities, O&M building, and
13 Western's proposed switching station would likely be affected in the short term. When construction is
14 completed, access for motorized travel might increase due to the construction of 29 miles of new roads.

15 Given the number of vehicle trips during the construction period, along with the movement of heavy
16 construction equipment, it is reasonable to anticipate that the Proposed Action might damage public roads
17 through increased use. Impacts on local streets would likely occur during the construction phase, as only
18 minor vehicle use is anticipated during O&M and decommissioning. The Proposed Project site is in a
19 relatively undeveloped area, and it is anticipated that construction traffic would result in short-term
20 effects on access or road conditions.

21 Construction of the Proposed Action would have a beneficial effect on road conditions because it would
22 result in restoration of a county road to its preconstruction conditions for both the base and surface.

23 Construction of Western's proposed switching station would not involve the construction of any new
24 roads, only the upgrading of an existing access road for a short distance. Implementation of Western's
25 Construction Standard 13 would minimize impacts to transportation.

26 O&M and Decommissioning. Short-term increases in the use of local roadways would occur during the
27 decommissioning period from the transport of heavy equipment and labor force. Heavy equipment would
28 remain at the site until reclamation was completed. With the implementation of the applicable APMs ,
29 impacts on transportation and motorized vehicle access from O&M and decommissioning of MET towers,
30 WTGs, communications and transmission lines, roads, O&M building, and Western's proposed switching
31 station would result in temporary and minimal impacts on transportation and access. Most roads to these
32 facilities would be open to motorized travel, and impacts from O&M vehicles that access the project area
33 for routine maintenance would be minimal. Barriers would be placed where the transmission line ROW
34 intersects local roads to prevent unauthorized use. This would limit access for public motorized travel in
35 localized areas in the long term.

36 Overweight and oversized loads could cause short-term disruptions to local traffic. Effects on
37 transportation during decommissioning would be reduced with the implementation of the applicable
38 APMs described above.

39 During O&M of the Proposed Action, there would be a long-term increase in traffic volume of up to 30
40 trips per day (for a staff of 15, including morning and evening trips). There would be additional irregular
41 increases in traffic volume due to scheduled and unscheduled maintenance. Typical activities during
42 decommissioning would include removing the facility features, including breaking concrete pads and
43 foundations, removing facility access roads that are not maintained for other uses, and revegetating the
44 site.

4.7.2.3 87 WTG Layout Alternative

Effects under the 87 WTG Layout Alternative would be similar to those identified under the 96 WTG Layout Alternative. The construction phase truck traffic and the number of truck trips would be slightly lower (9.025 truck trips) under the 87 WTG Layout Alternative. The construction of nine less WTGs would result in fewer truck trips to transport equipment. This would slightly decrease impacts on traffic flow and reduce the potential for traffic delays compared to the 96 WTG Layout Alternative. Access and opportunities for motorized travel on the existing and proposed new access roads during construction would likely remain unchanged.

The construction of approximately 27 miles of new roads could result in a smaller increase in access for motorized travel compared to the 96 WTG Layout Alternative (~29 miles). Future roadway improvements in and around Searchlight could reduce potential traffic delays, improve traffic flow, and increase access for motorized travel. Effects would be moderately decreased, but the type, intensity, and duration of effects would be similar to the Proposed Action with implementation of the recommended APMs and MMs.

4.7.3 Mitigation

In addition to the aforementioned APMs to reduce impacts to transportation, the following mitigation measures would be implemented:

MM TRAN-1: Traffic Management Plan. A Traffic Management Plan will be prepared that identifies BMPs to minimize construction-related traffic impacts. Specifically, the BMPs would ensure an adequate flow of traffic in both directions by providing sufficient signage to alert drivers of construction zones, notifying emergency responders prior to construction, conducting community outreach, and controlling traffic around affected intersections. The Plan will include the following:

- Consideration of the turbine manufacturer-provided dimensions and weight; maximum axle loads; and local regulations.
- Obtaining requisite transportation permits.
- Providing escort for components as required by the length, weight, or width.
- To further reduce effects to the US-95/Cottonwood Cove Road (SR 164) intersection, the Plan will identify an alternate access route to the Proposed Project site during peak construction if possible.
- Truck traffic will be phased throughout construction.
- Truck traffic will be restricted to the roadways developed or upgraded for the Proposed Project.
- Existing unimproved roads not associated with the Proposed Project would be used in emergency situations only.
- Deliveries of materials will be scheduled for off-peak hours to reduce effects during periods of peak traffic. Truck traffic will use designated truck routes when arriving to and departing from the proposed work sites.
- Providing alternate transportation routes should temporary road closures be required.
- The Applicant will encourage the construction workforce to carpool or vanpool.
- Signs and public notices regarding construction work will be distributed before disruptions occur and will identify detours to maintain access.
- To minimize the effects on local and Lake Mead traffic the Transportation Plan will mandate the use of flagmen or escort vehicles to control and direct traffic flow, and provide schedules that show roadway work will be done during periods of minimum traffic flow.
- Ongoing ground transportation planning will be conducted to evaluate road use, minimize traffic volume, and ensure that roads are maintained adequately to minimize associated impacts.

1 **MM TRAN-2: Repair Damaged Streets.** Before construction, the Applicant, a BLM representative,
2 and a local representative will document the condition of the access route, noting any preconstruction
3 damage. After construction, any damage to public roads will be repaired to the road's preconstruction
4 condition, as determined by the local representative and BLM.

5 **4.7.4 Residual Effects**

6 Under both action alternatives, there would be short-term and long-term increases in traffic volume and
7 decreases in access to local roadways that could not be eliminated completely through implementation of
8 APMs, Construction Standards, and MMs. Short-term increases in traffic volume would be considerable
9 and would affect the LOS of roads in the Proposed Project area, particularly during construction and peak
10 traffic times. These effects would be minimized by implementation of the recommended APMS and
11 MMs. Long-term increases would be negligible and would not be likely to affect the LOS at any
12 intersections in the project vicinity.

1 **4.8 Land Use Impacts**

2 This section discusses effects on land use that may occur with implementation of the Proposed Action or
3 alternatives.

4 **4.8.1 Indicators**

5 The Proposed Action would affect land use if it:

- 6 • Affects use of an existing ROW;
- 7 • Conflicts with existing federal, state, or local land use plans or policies;
- 8 • Conflicts with existing BLM land use authorizations;
- 9 • Changes public land disposition; or
- 10 • Restricts land tenure adjustments.

11 The BLM 1998 Las Vegas RMP management decisions and Clark County land use designations, as
12 outlined in Section 3.8 in Chapter 3, were considered as the baseline of the following discussion.

13 **4.8.2 Direct and Indirect Effects by Alternative**

14 This section describes the effects under each alternative as prescribed under NEPA. To compare effects,
15 this analysis defines the temporal scale (time), spatial extent (area), and intensity of effects for each
16 alternative.

17 **4.8.2.1 No Action Alternative**

18 Under the No Action Alternative, the ROW application would be denied and the Proposed Project would
19 not be built; therefore, no project related effects on land use would occur.

20 **4.8.2.2 96 WTG Layout Alternative**

21 Under the 96 WTG Layout Alternative, the BLM would approve the ROW applications and the Proposed
22 Action would be carried forward. Effects that could result from the implementation of the Proposed
23 Action during construction, O&M, or decommissioning activities are analyzed in this section. The
24 Applicant will implement the following mitigation measures to avoid and minimize impacts on existing
25 and proposed land uses within the Proposed Project area:

- 26 • APM-1 Erosion Control
- 27 • APM-2 Excavation/Grading
- 28 • APM-3 Air/Dust Control
- 29 • APM-4 SWPP
- 30 • APM-5 SPCCP
- 31 • APM-6 Health and Safety Program
- 32 • APM-7 Emergency Response Plan
- 33 • APM-8 Waste Management Plan
- 34 • APM-9 Weed Control Plan
- 35 • APM-10 Site Rehabilitation Plan and Facility Decommissioning Plan
- 36 • APM-11 Aeronautical Considerations
- 37 • APM-13 Environmental Clearance
- 38 • APM-14 General Design and Construction Standards

39 Additionally under the Proposed Action, the BLM would authorize Western to construct, operate, and
40 maintain the proposed switching station. For construction of Western's proposed switching station,

1 Western will require the construction contractor to incorporate specific provisions to mitigate impacts
2 related land-use resources in Western’s Environmental Construction Standard 13, specifically the
3 following sections:

- 4 • 13.3 Landscape Preservation
- 5 • 13.5 Noxious Weed Control
- 6 • 13.8 Disposal of Waste Material
- 7 • 13.13 Prevention of Air Pollution
- 8 • 13.16 Prevention of Water Pollution
- 9 • 13.19 Conservation of Natural Resources

10 With implementation of the APMs and Western’s Construction Standards, the Proposed Action would
11 result in short-term and negligible effects on land use authorizations, and long-term, beneficial effects on
12 public access and road conditions.

13 **Land Ownership**

14 Over 90% of the Proposed Project would be constructed on public lands administered by the BLM. The
15 5.5% of the project area that includes privately owned parcels would not be affected by the construction,
16 O&M, or decommissioning of the Proposed Project, as it has been sited to specifically avoid privately
17 owned parcels.

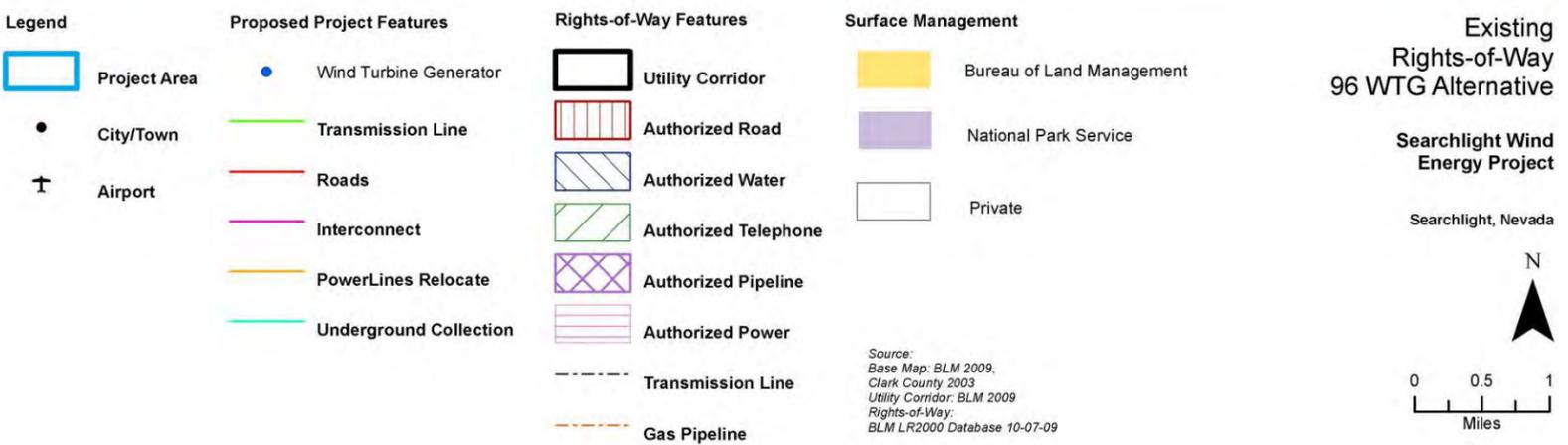
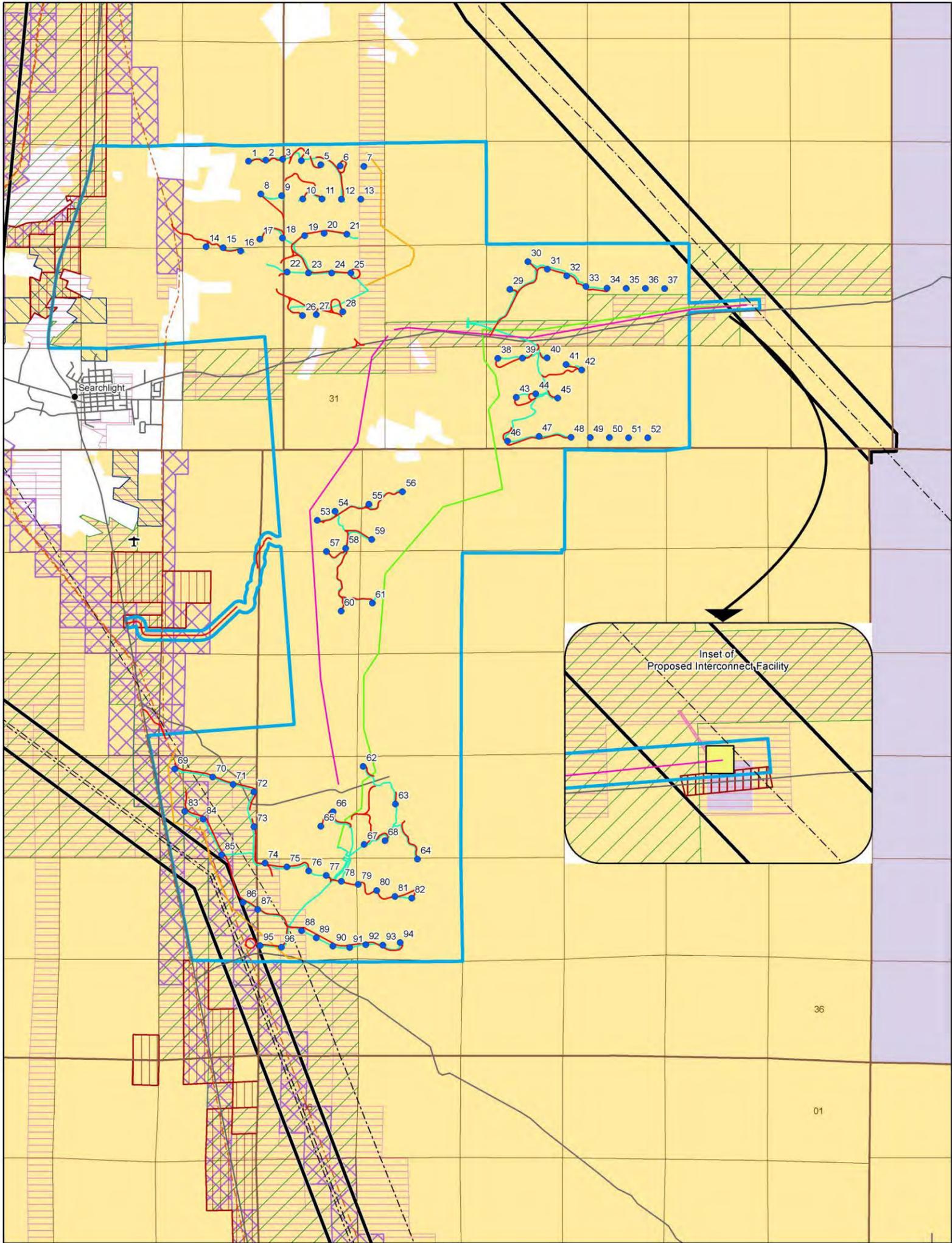
18 **Governing Land Management Plans**

19 With the implementation of the APMs and Construction Standards (listed above), the Proposed Project
20 elements (including Western’s proposed switching station) and activities would be consistent with current
21 DOI directives and Instruction Memorandums as well as existing BLM and Clark County land use
22 management plans. Therefore, no additional impacts on any federal, state, or local land use plans or
23 policies, existing BLM land use authorizations, public land disposition, or land tenure adjustments would
24 occur as a result of the Proposed Action.

25 **Utility Corridors and Rights-of-Ways**

26 Construction of a new road would impact two existing utility corridors (Figure 4.8.1). The two corridors
27 include a gas pipeline to the north and south of Searchlight and a Nevada Power Company ROW along
28 the southwest border of the Proposed Project area. Where existing access needs to be upgraded in any
29 ROW, or where new access crosses an existing ROW, the Applicant would coordinate with the respective
30 operators of each corridor. Implementation of APMs 1-4 and APM-9 would reduce impacts from the
31 Proposed Project construction to negligible levels.

32 Existing roads would be upgraded and new roads would be constructed, which could temporarily affect
33 local transportation and public access. During construction, O&M, and decommissioning, the Applicant
34 and its contractors would have the right for ingress and egress necessary for these activities. Placement of
35 WTGs and ancillary facilities and the development of access roads would preempt existing uses on a
36 minor scale but would not affect overall pre-existing or future access and use practices. Upon
37 decommissioning and the removal of structures and facilities, preconstruction vegetated areas would be
38 restored (APM-10) and former land uses could resume. The anticipated impacts on land use resources
39 within the project area during construction, O&M, and decommissioning would be similar in duration and
40 intensity.



1

2 **Figure 4.8-1. WTG 96 Alternative and Existing ROWs.**

1 Per the objectives in the Las Vegas RMP the Applicant and Western would meet public demand and
2 reduce impacts to sensitive resources by providing an orderly system of development for transportation,
3 including legal access to private in holdings, communications, flood control, major utility transmission
4 lines, and related facilities.

5 In addition, all public lands within the planning area are available at the discretion of the agency for right-
6 of-way under the authority of the Federal Lands Policy Management Act.

7 **Special Designations**

8 The Piute-Eldorado Valley ACEC is adjacent to and surrounds the project area. A small portion of the
9 project area extends into the ACEC on the eastern boundary encompassing Western's proposed switching
10 station and tie line. Per the BLM RMP, the Switching Station would be located within one-half mile of a
11 federally-designed highway that allows development of non-linear facilities (BLM 1998). With the
12 exception of the Switching Station, no construction or O&M activities, laydown areas, WTGs,
13 substations, or access areas are within the Piute-Eldorado Valley ACEC. Implementation of APMs 1-4
14 and APM-9 would reduce impacts from the Proposed Project construction, O&M, and decommissioning
15 activities on soil erosion, air quality, and the inadvertent introduction of noxious or invasive weeds into
16 the ACEC. The Proposed Action would not restrict access to NPS SMAs.

17 **Disposal Lands**

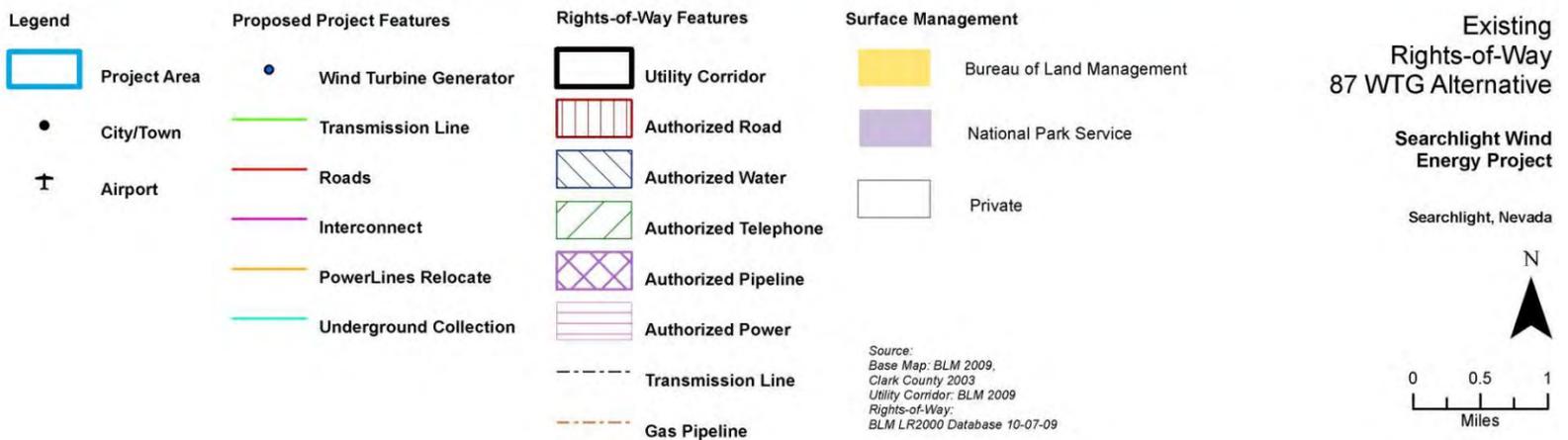
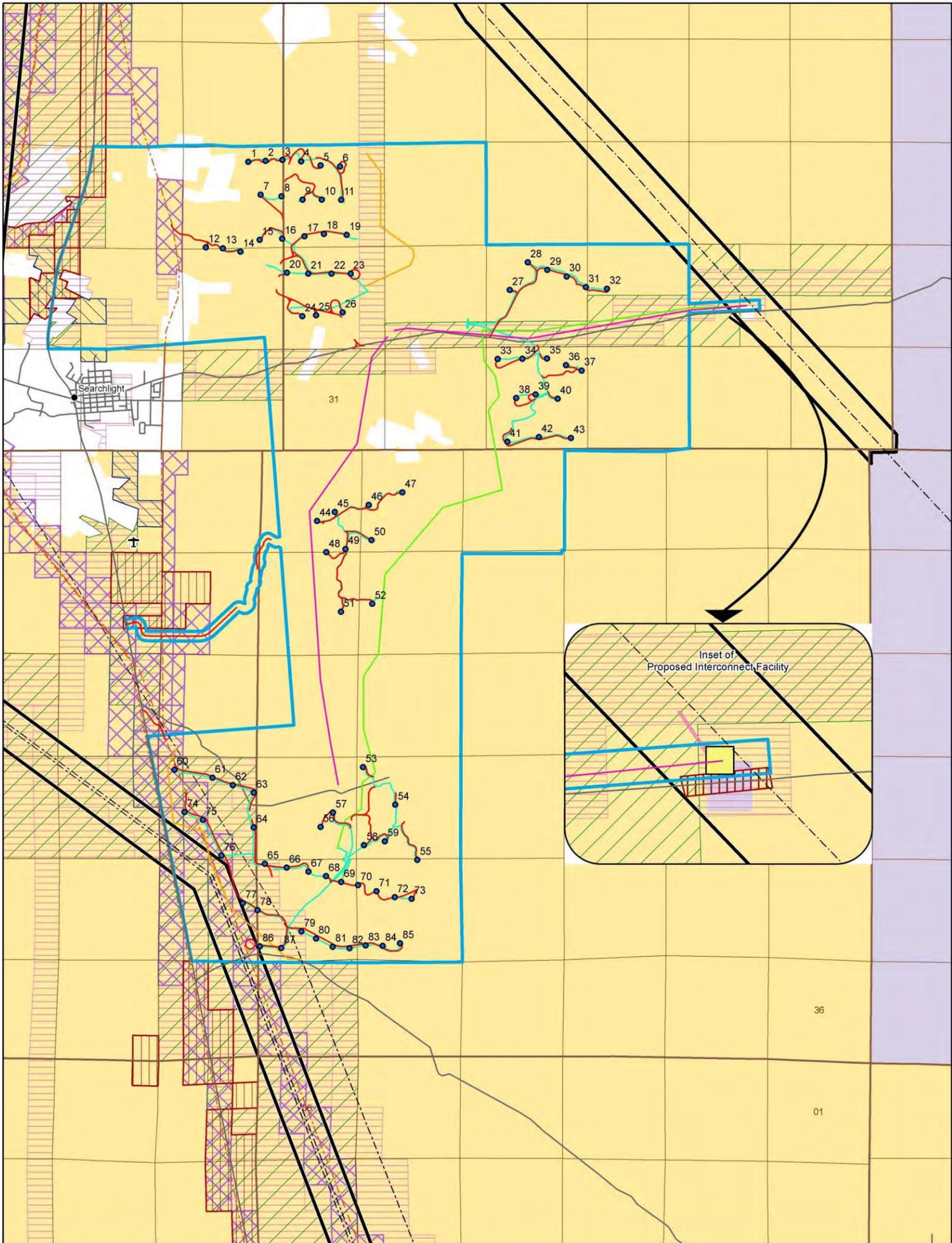
18 The southern segment of designated disposal land adjacent to Searchlight would be affected through
19 construction of an access road that connects the project to Highway 95. Approximately .43 miles of road
20 would be built. Construction of this road would be a moderate, beneficial impact to the people of
21 Searchlight and to prospective purchasers of the disposal lands. It would provide additional access to the
22 Disposal Lands without any cost to those who might wish to develop these properties in the future.
23 Implementation of APMs 1-4 and APM-9 would reduce impacts from the Proposed Project construction,
24 O&M, and decommissioning activities on soil erosion, air quality, and the inadvertent introduction of
25 noxious or invasive weeds into the ACEC.

26 **Airport**

27 The Proposed Action would require a Determination of No Hazard to Air Navigation (NOHA) from the
28 FAA for each WTG. Although coordination with the FAA has not yet been initiated, based on the lighting
29 and marking requirements for similar projects and the FAA Obstruction Marking and Lighting Advisory
30 Circular (AC70/7460-1K), determination of an adequate lighting setup for the Proposed Action is
31 expected, as outlined in Section 2.3.3, Public Access and Safety. Implementation APM-11 would ensure
32 that impacts associated WTGs would be identified prior to completion of final project design.

33 **4.8.2.3 87 WTG Layout Alternative**

34 Effects under the 87 WTG Layout Alternative would be similar to those identified under the 96 WTG
35 Layout Alternative (Figure 4.8-2). The temporarily disturbed area and permanently disturbed area for
36 construction would be decreased under this alternative compared to the 96 WTG Alternative, but the type,
37 intensity, and duration of the effects would be similar. The construction of nine more WTGs would result
38 in more truck trips to transport equipment, a slightly higher difference in construction phase truck traffic
39 (9,931 truck trips). The construction of 27 miles of new roads could result in a slight decrease in access
40 for public motorized travel compared to the 96 WTG Layout Alternative (29 miles). Future roadway
41 improvements in and around Searchlight could reduce potential traffic delays, improve traffic flow, and
42 increase access for motorized travel. The equivalent APMs, and Construction Standards used for the 96
43 WTG Layout Alternative to minimize impacts would be applicable for the 87 WTG Layout Alternative.



1

2 **Figure 4.8-2. 87 WTG Layout and Existing ROWs.**

1 **4.8.3 Mitigation**

2 With implementation of the APMs listed above, the Proposed Action and Alternative would result in
3 short-term and negligible effects on land use authorizations, and long-term, beneficial effects on public
4 access and road conditions. Therefore, no mitigation measures beyond those listed above are necessary.

5 As described above, the southern segment of designated Disposal Land adjacent to Searchlight would be
6 impacted through construction of an access road that connects the project to Highway 95. Approximately
7 0.43 miles of road would be built, yielding a total disturbance of 1.92 acres. Construction of this road
8 would be a moderate, beneficial impact to the people of Searchlight and to prospective purchasers of the
9 disposal lands. It would provide additional access to the Disposal Lands without any cost to those who
10 might wish to develop these properties in the future. Beyond the APMs described previously, no
11 mitigation measures are necessary to mitigate these impacts.

12 **4.8.4 Residual Effects**

13 The Proposed Project would not have any residual impacts on land use relative to the criteria outlined in
14 this section.

4.9 Visual Resources Impacts

4.9.1 Indicators

Adverse effects on visual resources would occur if the Proposed Project:

- Creates visual contrasts that exceed the allowable levels associated with VRM Class III objectives denoted in the RMP; or
- Substantially interferes with the dark skies goals and objectives.

4.9.2 Methods

BLM VRM system methodology was used to evaluate the potential effects of the Proposed Project on the current viewing environment.

Visual Simulations and Visual Contrasts

In order to assess the visual contrast between the existing landscape and the Proposed Project, computer-aided simulations were prepared. Using the visual simulations, the contrast between the existing environment and the Proposed Project was evaluated. Contrast was evaluated for the following:

- **Structure contrast.** Structure contrast is determined by the degree to which the Proposed Project would contrast with the surrounding landscape character. The introduction of new/modified structures to the existing landscape creates impacts on scenic quality and sensitive viewers.
- **Vegetation contrast.** Vegetation contrast is determined by examining the diversity and complexity of existing vegetation. The degree of vegetation to be removed to construct roads and maintain ROWs and clearance zones determines the contrast level. Typically, the more diverse and dense the vegetation, the higher the contrast level. The removal of vegetation in an undeveloped or vacant area creates a distinct line, which draws the viewer's attention.
- **Landform/Water contrast.** Landform and water contrast is the change in landform patterns, water features and impoundments, exposure of soils, or scars that would result from erosion, landslides, slumping, or other disturbances noticeable as uncharacteristic in the natural landscape, such as roads.

After determining structural, vegetation, and landform/water contrast, overall visual contrast is determined by combining the contrast levels for an overall contrast rating. Structural contrast is typically the dominant factor in overall visual contrast. Therefore, structural contrast carries a slightly higher weight in determining visual contrast levels.

Visual Impact Evaluation

Visual simulations and visual contrast ratings helped to determine the level of impact. Additionally, other factors helped determine the level of impact for each proposed alternative, including the cultural significance and the local values. The degree of contrast is determined in accordance with the following definitions:

- **Strong** – The element contrast demands attention, will not be overlooked, and is dominant in the landscape.
- **Moderate** - The element contrast begins to attract attention and begins to dominate the characteristic landscape
- **Weak** – The element contrast can be seen but does not attract attention..
- **None** – The element contrast is not visible or perceived.

4.9.3 Direct and Indirect Effects by Alternative

4.9.3.1 No Action Alternative

Under the No Action Alternative, the ROW application would be denied and the Proposed Project would not be built; therefore, no project related effects on visual resources would occur.

4.9.3.2 Proposed Action - 96 WTG Layout Alternative

Under the 96 WTG Layout Alternative, the BLM would approve the ROW applications and the Proposed Action would be carried forward. Effects that could result from the implementation of Proposed Action during construction, O&M, or decommissioning activities are analyzed in this section. The Applicant has incorporated the following measures to avoid and minimize impacts on visual resources within the Proposed Project area:

- APM-3 Air/Dust Control
- APM-10 Site Rehabilitation Plan and Facility Decommissioning Plan
- APM-14 General Design and Construction Standards

Additionally under the Proposed Action, the BLM would authorize Western to construct, operate, and maintain the proposed switching station. For construction of Western's proposed switching station, Western will require the construction contractor to incorporate specific provisions to mitigate impacts related to visual resources in Western's Environmental Construction Standard 13, specifically the following sections:

- 13.3 Landscape Preservation
- 13.19 Conservation of Natural Resources

Visual Resources

Construction. Under the 96 WTG Layout Alternative, visual intrusions might result from the presence of construction vehicles, equipment and materials, and workforce in staging areas, along access roads, and along new overhead transmission line ROW. Effects from construction activities would be minimized in the short-term through implementation of APM-3.

Land scarring from the grading of staging areas and construction yards, construction of new access roads, and activities adjacent to construction sites and along ROWs would be long-lasting in semi-arid environments, where vegetation recruitment and growth are slow. Views along linear land scars or newly bladed roads would introduce potentially adverse visual change and contrast by causing unnatural vegetative lines and soil color contrast. Vegetation clearing would occur during construction and, in some instances, would remain substantially cleared for the life of the Proposed Project, while other areas would be restored with native plant materials.

Effects during construction of the switching station would be similar to those discussed above temporarily affecting 7 acres, half of which would be reclaimed post construction. Implementation of Western's Construction Standard 13 would help reduce the effects on visual resources.

O&M and Decommissioning. A moderate contrast would occur from the long-term presence and O&M of the WTGs (due to the large vertical structures and multiple oscillating rotors on the nacelles of each tower), ancillary facilities, and transmission lines.

Not all viewers at a given KOP may experience the same level of contrast. For example, foreground views of the Proposed Project facilities from a KOP that has an open, panoramic view might result in substantial contrast, while views from adjacent areas of the same distance might be screened by landforms or vegetation, resulting in weak or no contrast. Effects to visual resources would be minimized by the implementation of APM 3, APM 10, and APM 14.

1 After preparation and review of the visual simulations, it was determined that Proposed Action
2 components would not be visible from KOP 1, which is approximately 37 miles from the Proposed
3 Project area; therefore, this KOP has been eliminated from the visual impacts analysis. Additionally, the
4 Proposed Project would not be seen or barely be distinguishable from the following KOPs:

- 5 • KOP 3 – US-93 Hillside Curve (view from US-93 approximately 30 miles from the project area)
- 6 • KOP 4 – Windy Point Campground (view from Windy Point Camping Area approximately 38
7 miles from the project area)
- 8 • KOP 5 – Palm Gardens Community (view from Palm Gardens approximately 13 miles from the
9 project area)
- 10 • KOP 9 – View from Cottonwood Cove Marina Looking West (view from the new dock/pier
11 facility on Lake Mohave, approximately 10.5 miles from the project area)

12 These KOPs represent barely seen views (i.e., the distance from the KOP to the Proposed Project site is 6
13 to 10 miles for a background view and greater than 10 miles for a barely seen view). Due to the distance
14 and atmospheric conditions, only the motion of the blades may be discernible. Open panoramic views of
15 the broad Piute Valley floor with rolling hills and distant mountain silhouettes offer a moderate level of
16 visible manmade disturbance and landscape contrast within the view. No contrast would be discernible to
17 motorists at KOP 3, recreationalists at KOP 4 and KOP 9, and residents at KOP 5. Visual simulations
18 from these KOPs are included in Appendix E.

19 Additionally, several KOPs (KOPs 7, 13, 14, and 16) had similar views and visual contrast rating forms.
20 In these cases, a representative KOP is included in this EIS instead of every similar KOP to reduce
21 redundancy; however, all visual simulations and contrast rating forms are included in Appendix E for
22 reference.

23 All WTGs would be constructed within designated VRM Class III areas. As stated in Chapter 3.9, the
24 objective of this VRM class is to partially retain the exiting character of the landscape. Construction of
25 the WTGs would be in conformance with VRM Class III objectives.

26 **KOP 2 – View from US-95 Looking Southwest**

27 Figure 4.9-1 represents the simulated view that motorist viewers would have traveling south on US-95
28 north of Searchlight. Viewers at this location would be approximately 3.5 miles north of the Proposed
29 Project area, which represents a middleground view. The viewshed analysis demonstrates that the
30 northernmost portion of the project area and portions of up to 15 WTGs would be visible from KOP 2.
31 Views are considered to be of low to moderate scenic quality due to the presence of some distinct
32 landscape features that are interrupted by, and contrast with, surrounding manmade alterations in the area
33 such as roads, power lines, and radio or cell phone towers.

34 The WTGs would introduce white vertical and angular lines into the landscape and would be visible
35 against the jagged mountain horizon, causing a moderate contrast in color and weak contrasts in line and
36 form. The white WTGs would have a weak contrast with the existing various hues of green vegetation
37 and tan soils. From this section U.S. 95, the project would be in view for approximately 5 miles.
38 Motorists traveling at the average speed of 45 mph would view the project for no more than 7 minutes.



Existing



Simulation

Figure 4.9-1. KOP 2 – View from US-95 Looking Southwest

1 KOP 6 – View Across Lake Mohave

2 Figure 4.9-2 represents the view that recreational viewers who are boating/fishing on Lake Mohave would
3 have looking east toward the Proposed Project. Viewers at this location would be approximately 10.3
4 miles east of the nearest visible turbine. This represents a background view. The viewshed analysis
5 demonstrates that the easternmost portion of the project area maybe visible from KOP 6 and portions of
6 up to 50 proposed WTGs could be seen. A viewer may be able to discern the smooth white cylindrical
7 base of the WTG against the brown and green medium-textured background. However, due to the
8 distance, terrain, and atmospheric conditions, contrasts in texture would be weak. The WTGs would
9 introduce a moving, vertical, angular structures against the rugged mountain background resulting in a
10 moderate contrast in form, line, and color.



Existing



Simulation

Figure 4.9-2. KOP-6 – View Across Lake Mohave

KOP 8 – New Housing Development in Searchlight – Looking South to Southeast

Residential viewers from KOP 8 (Figure 4.9-3), a new residential development south of Cottonwood Cove Road, would have a substantial level of visibility to the Proposed Action. Viewers at this location would be approximately 0.3 mile west of the project area, which represents a foreground view. The viewshed analysis (i.e. DEM) demonstrates that almost all of the project area (a panoramic view) is visible from KOP 8 and portions of up to 96 WTGs could be seen; however, the visual simulation reveals that the number of viewable WTGs would be less than 96, with the most visible WTGs appearing in the skyline of the mountainous view. This residential community is still under construction, and when all the manmade structures are complete, they could partially screen views of the surrounding landscape and portions of many of the proposed WTGs. Partially screened views of the distant mountainous terrain offer a moderate level of visible contrast of form and color within the view.



Existing



Simulation

Figure 4.9-3. KOP 8 – View from New Housing Development in Searchlight-West End of Town.

1 **KOP 10 – View of Travelers Exiting the Lake Mead NRA and Lake Mohave on**
2 **Cottonwood Cove Access Road**

3 The Proposed Action would have a higher level of visibility for recreational travelers exiting
4 Lake Mead NRA and Lake Mohave on Cottonwood Cove Road, adjacent to the new entrance
5 station at KOP 10 (Figure 4.9-4). Viewers at this location would be approximately 0.5 mile east
6 of the project area, which would be a foreground view. The viewshed analysis demonstrates that
7 almost half of the project area is visible from KOP 10 and a portion of approximately 49
8 proposed WTGs could be seen, some immediately adjacent to the view. The visual simulation
9 reveals that a high number of WTGs are visible from this location; however, many of them are
10 screened by the dramatic terrain of Fourth of July Mountain (the focal point of the view). Focal
11 and panoramic views of the rolling hills and mountainous terrain would be interrupted by the
12 vertical lines of the WTGs, creating a moderate to high contrast in color and line. Visitors
13 existing Lake Mead NRA would have a view of the project for 10 miles. Vehicles traveling an
14 average of 45 mph would view the project for no more than 15 minutes.



Existing



Simulation

Figure 4.9-4. KOP 10 – View exiting Lake Mead NRA.

1 **KOP11 – View from Communication Towers near Spirit Mountain**

2 Recreational viewers and Native Americans hiking up Spirit Mountain would have a low level of
3 visibility to the Proposed Action (Figure 4.9-5). Viewers at this location would be approximately
4 12 miles southeast of the project area, representing a middleground-to-background view. The
5 viewshed analysis demonstrates that the southwestern corner of the project area would be visible
6 from KOP 11 with portions of up to 80 WTGs; however, due to the great distance, it can be
7 assumed that only the blade tips or motion of the blades could be discernible from this KOP
8 resulting in a weak contrast in color, form, and line. Open panoramic and superior (high-
9 elevation) views of rolling hills and dramatic, angular mountainous terrain offer low landscape
10 contrast because of both the scarcity of such views in the region and a low level of visible
11 manmade disturbance within the view.



Existing



Simulation

Figure 4.9-5. KOP 11 – Looking North from Communication Towers near Spirit Mountain.

1 **KOP 12 – View from Cal-Nev-Ari North toward Searchlight**

2 From KOP 12, the Proposed Action would have a minor-to-moderate level of visibility on
3 residential viewers and moderately-sensitive travelers along US-95 south of Searchlight (Figure
4 4.9-6). Viewers at this location would be approximately 5.1 miles south of the project area, which
5 would be a middleground view. The viewshed analysis demonstrates that most of the project area
6 is be visible from KOP 12 and portions of all the proposed WTGs could be seen. The WTGs
7 would introduce multiple vertical, white, smooth structures into the viewshed resulting in a weak
8 to moderate contrast in line, form and color.



Existing



Simulation

Figure 4.9-6. KOP-12 – From a Residence Looking North to the Proposed Project Area

1 **KOP 15 – View from Cottonwood Cove Entrance Station Looking South**

2 Recreational viewers from KOP 15, Cottonwood Cove Access Road, would have a high level of
3 visibility to the Proposed Action (Figure 4.9-7). Viewers at this location would be approximately
4 0.3 mile west of the project area. Although some natural screening exists, approximately 7 WTGs
5 would be in the foreground. The WTGs would contribute to the vertical lines in relation to the
6 rugged terrain. Visual contrast in line, color, and form are anticipated moderate with the 96 WTG
7 Layout Alternative.



Existing



Simulation

Figure 4.9-7. KOP 15 – View from Cottonwood Cove Access Road Looking South

1 KOP 17 – View from Cottonwood Cove Access Road at MP 4 Looking East

2 Recreational viewers from KOP 17, Cottonwood Cove Access Road, would have a high level of visibility
3 to Western’s proposed switching station (simulation currently under development). Viewers at this
4 location would be directly adjacent to the switching station, which represents a foreground view. The
5 switching station would introduce another manmade structure into the foreground, although several
6 structures, including a propane tank, parking area, overhead transmission lines, lights, and the park
7 entrance station, already exist in the area. Because manmade structures exist in the area including the NPS
8 Fee Station, Cottonwood Cove Road, and various radio and cell towers, the switching station would cause
9 a weak to moderate contrast in form, texture, and line.

10 Dark Skies

11 FAA regulations require that some WTGs be equipped with lights that intermittently flash red (2,000
12 candela). Typically, these lights are required on the “end” WTGs in a string and every 1,000 to 1,400 feet
13 along a WTG string. These lights are not expected to contribute to sky glow or glare because of the
14 intermittent nature and color of these lights. However, security or safety lighting that is typically
15 associated with wind energy facilities could increase their visibility during dark hours and thus contribute
16 to sky glow or glare.

17 4.9.4 Mitigation Measures

18 Mitigation measures that would provide a reduction in the contrast of project facilities with the existing
19 landscape and would reduce the effects of lighting include the following:

20 MM-VIS-1: Minimize Surface Disturbance. Operators will reduce visual impacts during construction
21 by clearly delineating construction boundaries and minimizing areas of surface disturbance; preserving
22 vegetation to the greatest extent possible; using undulating surface disturbance edges; stripping,
23 salvaging, and replacing topsoil; using contoured grading; controlling erosion; using dust suppression
24 techniques; and restoring exposed soils as closely as possible to their original contour and vegetation.

25 MM-VI2-2: Choose BLM-approved Standard Environmental Colors for All Structures. All
26 structures including Western’s proposed switching station will be constructed of materials that restrict
27 glare and will be finished with a BLM-approved Standard Environmental Color intended to blend with
28 the surrounding environment. Due to the height of the WTGs and the oscillating motion of the blades, it is
29 difficult to make the towers blend into the landscape; however, a flat gray paint color will tone down the
30 usual white design and reduce glare. Any color other than white will need to be approved by the FAA. If a
31 color is not easily distinguishable for pilots, daytime strobe lights will be needed, thus negating the
32 mitigation (FAA 2007).

33 MM-VIS-3: Minimize Profiles of Site Design Elements. Site design elements will be integrated with
34 the surrounding landscape, such as minimizing the profile of the ancillary structures, burial of cables, and
35 use of timed, motion-sensor, and directional lighting.

36 MM-VIS-4: Minimize Road and Gravel Contrast. The colors of the asphalt and gravel used for
37 circulation and parking areas at the O&M building will be selected to minimize contrast with the site’s
38 soil colors. Roads will be contoured to blend into the existing topography.

39 MM-VIS-5: Minimize Lighting. Efforts will be made to minimize the need for and amount of lighting on
40 ancillary structures. When possible, lighting will be associated with motion sensors to minimize constant
41 lighting effects. The only exterior lighting on the WTGs will be the aviation warning lighting required by
42 the FAA. The warning lighting will be the minimum required intensity to meet the current FAA
43 standards. Outdoor night lighting at the O&M facility will be the minimum necessary for safety and
44 security. All lights will be shielded to reduce offsite light pollution. Motion sensor lighter will be used
45 when possible.

1 4.9.4.1 87 WTG Layout Alternative

2 Effects under the 87 WTG Layout Alternative would be similar to those identified under the Proposed
3 Action. The temporarily disturbed area (230 acres) and permanently disturbed area (152 acres) for
4 construction would be decrease under this alternative compared to the Proposed Action, but the type,
5 intensity, and duration of the effects would be similar. Both the construction of 29.2 miles of new roads
6 (which could result in an decrease in access to the project area compared to the 96 WTG Layout
7 Alternative ([27.5 miles]) and the construction of nine more WTGs could increase the level of visibility
8 from some KOPs for residents and recreationists within the project area and vicinity. The equivalent
9 APMs and MMs used for the Proposed Action to minimize visual impacts would be applicable for the 87
10 WTG Layout Alternative

11 4.9.5 Residual Effects

12 Long-term residual effects to visual resources would result from implementation of the 96 WTG Layout
13 Alternative or the 87 WTG Layout Alternative. Although implementation of the APM or MMs would
14 reduce the contrast of the WTGs in the project area, the structures would still be prominent features on the
15 landscape. The WTGs would be constantly moving which attract the viewer's attention increasing the
16 visual contrast with the surrounding landscape.

4.10 Noise Impacts

This section discusses the effects on the ambient noise and vibration levels that might occur with implementation of the Proposed Action or alternatives. Indicators used to identify and analyze effects are presented and potential effects are discussed. APMs, Western’s Construction Standards, and agency-recommended mitigation measures are presented along with a discussion of residual impacts.

4.10.1 Indicators

The Proposed Action would affect ambient noise and vibration levels if it:

- Results in the generation of noise levels or exposure of persons and sensitive species to noise levels in excess of standards established in applicable federal, state, and local general plans or noise ordinances at nearby noise-sensitive areas; or
- Results in generation of, or exposure of persons to, ground borne vibration or ground borne noise levels in excess of 75 vibration decibels (generally considered intrusive for residential uses) unless allowed by federal, state, or local codes or ordinances.

In order to compare effects associated with project elements inherent in the Proposed Action and alternatives, the indicators were considered both independently and in conjunction with one another using the following methodologies or assumptions.

Federal noise standards and guidelines, and Clark County noise standards were identified. Most of the federal standards would not appear to be directly applicable to the Proposed Project. In addition to the federal standards, the Lake Mead NRA has recommended that noise levels from operation of the Proposed Project do not exceed a Leq level of 35 dBA during nighttime hours on NPS lands. The Clark County noise ordinance limits noise levels. The identified noise standards and guidelines are discussed in detail in Section 3.10. The Clark County noise ordinance limits project operation noise levels at a residential property line. Since the thresholds are defined as the property line, an entire property parcel is effectively “covered” upon which recreational and other human activities may occur. Neither the BLM nor NEPA specify a threshold for “significant adverse effect” for noise. Reference noise levels used in this analysis were obtained from the Roadway Construction Noise Model User’s Guide (FHWA 2006). There are no known laws, ordinances, regulations, or standards that address noise exposure to wildlife in the project, see Biological Resources, Section 4.4 for a discussion of noise effects on wildlife.

Noise impacts are assumed to occur when aggregate. The aggregate project operation vibration level at a property line is defined as “discernible to the human senses.” This is a qualitative standard, which for purposes of a recommended impact assessment will be interpreted to mean a quantifiable value in accordance with applicable industry standards. Noise impacts are assumed to occur when aggregate nighttime project construction noise level at a property line exceeds decibel thresholds as established in subject Clark County regulations.

The Cadna/A[®] Noise Prediction Model (Version 3.72.131) was used to estimate project-generated operation sound levels at noise-sensitive receivers. Cadna/A[®] is a Windows[®]-based software program that predicts and assesses noise levels near industrial noise sources based on International Standards Organization 9613-2 standards for noise propagation calculations. The model uses these industry-accepted propagation algorithms and accepts sound power levels (PWL, in dB re: 1 picoWatt) provided by equipment manufacturers and other sources. The calculations account for classical sound wave divergence, plus attenuation factors resulting from air absorption, basic ground effects, and barrier/shielding. For purposes of defining an appropriate Cadna/A model, topographical data were imported to the model to represent terrain profiles in the vicinity of the project site. Discussion and results of this analysis are found in Section 4.10.3.

1 The primary indicator of noise levels for this analysis is the A-weighted average noise level measured in
2 decibels (L_{eq}). The one-hour average noise level (dBA L_{eq} [1-hour]) is often used to characterize ongoing
3 operations or long-term effects. The maximum dBA level (dBA L_{max}) is used to document the highest
4 intensity, short-term noise level. Another commonly used measure of noise effects is the daytime-
5 nighttime noise level (L_{dn}). The L_{dn} value matches the L_{eq} value for noise generated from 7:00 a.m. to
6 10:00 p.m. but accounts for increased public sensitivity to noise at night by the A-weighted equivalent
7 sound level for a 24-hour period with an additional 10 dB imposed on the equivalent sound levels for
8 nighttime hours of 10:00 p.m. to 7:00 a.m.

9 **4.10.2 Direct and Indirect Effects by Alternative**

10 To compare effects of each alternative, this analysis defines the temporal scale (time), spatial extent
11 (area), and intensity of effects for each alternative. Effects on the existing ambient noise and vibration
12 levels might arise from construction, O&M, and decommissioning equipment and vehicles as well as
13 from the introduction of construction or O&M-related traffic on local roads near the Proposed Project
14 area. All effects discussed in this section are direct. No indirect effects were identified for this resource.

15 **4.10.2.1 No Action Alternative**

16 Under the No Action Alternative, the ROW applications would be denied and the Proposed Project and
17 Western's proposed switching station would not be built; therefore, no project related effects on noise
18 levels would occur.

19 **4.10.2.2 Proposed Action – 96 WTG Layout Alternative**

20 Under the 96 WTG Layout Alternative, the Applicant would be authorized to construct, operate and
21 maintain, and decommission a 200-MW wind energy facility on BLM-administered lands. Effects that
22 could result from the implementation of the 96 WTG Layout Alternative during construction, O&M, or
23 decommissioning activities are analyzed in the discussion below. The Applicant has incorporated the
24 following APMs to avoid and minimize impacts of ambient noise and vibration levels on humans and
25 wildlife in the project vicinity:

- 26 • APM-6 Health and Safety Program
- 27 • APM-10 Site Rehabilitation Plan and Facility Decommissioning Plan
- 28 • APM-14 General Design and Construction Standards

29 Additionally under the Proposed Action, the BLM would authorize Western to construct, operate, and
30 maintain the proposed switching station. For construction of Western's proposed switching station,
31 Western will require the construction contractor to incorporate specific provisions to mitigate impacts
32 related to noise in Western's Environmental Construction Standard 13.

33 Construction. Construction would occur over approximately 8 to 12 months. During peak construction
34 activity, the Proposed Project would require an estimated 250 to 300 full- and part-time employees. The
35 Proposed Project would utilize conventional construction techniques and equipment, including
36 excavators, bulldozers, heavy trucks (e.g., water truck, dump truck), cranes, and similar heavy
37 construction equipment. The amount of construction equipment and the number of workers in any given
38 location of the project area would vary, but activity would be concentrated in specific areas and then
39 relocated as the WTGs are erected in an assembly-line fashion. These variations would result in varying
40 levels of construction-related noise. Noise levels from common construction equipment at various
41 distances can be estimated conservatively by assuming that the only sound-reducing mechanism is the
42 divergence of the sound waves in open air. Propagation of groundborne vibration from equipment and
43 vehicles is also assumed to be mitigated with greater distance. Thus, construction noise and vibration
44 levels related to the Proposed Project would vary during the construction period, depending on the
45 number and location of operating construction equipment relative to any specific receptor location.

To evaluate potential noise impacts resulting from project construction, reference noise levels were obtained from the Roadway Construction Noise Model User's Guide (FHWA 2006), which provides a comprehensive assessment of noise levels from construction equipment. Based on the reference values in the guide and the anticipated construction equipment to be used on the project, the loudest equipment would generally emit noise in the range of 80 to 90 dBA at 50 feet, with usage factors of 40 to 50% that account for the fraction of time that the equipment would be in use over the specified time period. Conventional construction activities at the project site would result in a short-term, temporary increase in the ambient noise level resulting from the operation of construction equipment. Noise levels for typical construction equipment are presented in Table 4.10-1.

Table 4.10-1. Noise Levels at Various Distances from Individual Typical Construction Equipment

Construction Equipment	Noise Level $L_{eq(1-h)}$ ^a at Distances (dBA)					
	50 ft ^b	250 ft	500 ft	1,000 ft	2,500 ft	5,000 ft
Bulldozer/scrapper	85	71	65	59	51	45
Concrete mixer	85	71	65	59	51	45
Concrete pump	82	68	62	56	48	42
Crane, derrick	88	74	68	62	54	48
Crane, mobile	83	69	63	57	49	43
Front-end loader	85	71	65	59	51	45
Generator	81	67	61	55	47	41
Grader	85	71	65	59	51	45
Shovel	82	68	62	56	48	42
Truck	88	74	68	62	54	48

Source: Final Programmatic EIS on Wind Energy Development on BLM-Administered Lands in Western U.S., Table 4.5-5.5.2-1 (BLM 2005b).

Note: An assumed propagation rate is 6 dBA per doubling of distance.

^a $L_{eq(1-h)}$ is the equivalent steady-state sound level that contains the same varying sound level during a 1-hour period.

^b To convert feet to meters, multiply by 0.3048.

According to Table 4.10-1, the loudest construction equipment would be a derrick crane and a truck. When a single sample of both of these two equipment categories are operated simultaneously, the noise level at 1,000 feet from the construction site would be estimated as 65 dBA (= 62 + 3 dB) L_{eq} .

Since the Clark County noise regulations allow construction-related noise during daytime hours, no adverse construction noise impacts during the day are anticipated. But should construction activities occur at night, predicted aggregate sound from such activities needs to be compared with the applicable Clark County nighttime noise level thresholds. Impacts would be generated when predicted nighttime construction noise levels exceed any of the indicated octave band limits, even if existing ambient noise levels at a receiving property line are measurably higher than the limits.

With implementation of the 96 WTG Layout Alternative, 1,400 feet is the closest distance between a potential noise-sensitive receiver and the nearest WTG location. Table 4.10-1 indicates that noise from the crane-truck pair would fall between 71 dBA (= 68 + 3 db) and 65 dBA L_{eq} at this receiver location. As long as this kind of activity takes place during daytime hours, no construction noise impacts are anticipated.

The site preparation phase would involve noise-generating activities such as clearing and grubbing, earthwork, and rough site grading, while the installation of WTGs would involve the installation of steel beams using percussive or vibration equipment in a manner similar to installing freeway guardrails.

The estimated sound level from construction vehicles in staging and laydown areas would be an average level of 89 dBA at 50 feet, according to the US Environmental Protection Agency (EPA 1971). At a

1 distance of 2 miles, the average noise level of 89 dBA at 50 feet would attenuate to less than 43 dBA and
2 continue to diminish in magnitude with increasing distance. If the nearest noise-sensitive location is
3 within 2 miles from the construction laydown and staging area, noise impacts from this source would be
4 unlikely due to the 43 dBA limit calculated from the Clark County nighttime residential district
5 thresholds.

6 Since the NDOT reports that AADT volume on US-95 for 2008 was 8,600 (NDOT 2009), the addition of
7 350 one-way trips per day (including travel by construction personnel and deliveries) associated with the
8 Proposed Project would thus be expected to result in a minimal rise in transportation noise levels (i.e.,
9 less than 1 dBA increase) and a non-discernible change.

10 Construction of the transmission lines would produce noise that could affect the closest resident
11 properties from the operation of construction equipment. The FTA provides guidelines for reasonable
12 criteria for assessment of construction noise (FTA 2006), indicating that construction noise that exceeds a
13 1-hour L_{eq} of 90 dBA or an 8-hour L_{eq} of 80 dBA during the day would provoke adverse community
14 reaction. The resident properties located closest to the project area would be affected by noise levels
15 discernible above background noise in the area during construction. However, construction activities
16 would be limited to daytime hours, and Clark County regulations provide an exemption for noise
17 generated during daytime construction activities.

18 Blasting might be necessary in order to construct access roads and set turbine foundations. The estimated
19 noise level from blasting activity can be derived from the FHWA Roadway Construction Noise Model
20 User's Guide. It describes that the maximum noise level at 50 feet from blasting would be 94 dBA. At
21 2,500 feet, and assuming the aforementioned conservative attenuation rate of -6 dB per doubling of
22 distance, the estimated noise level from this occasional blasting activity would be 60 dBA.

23 The only potential noise impact anticipated from the project substations and Western's proposed
24 switching station would occur during their construction. Noise levels associated with substation
25 construction would be less than the construction noise associated with other elements of the Proposed
26 Project; therefore, no adverse noise impacts are anticipated.

27 Other land uses and landscape designations that might be sensitive to noise impacts, such as recreation
28 and SMAs, might be affected by short-term increase of noise levels. Effects on recreational users might
29 be detectable along off-OHV routes but would be short-term and unlikely to impair the recreational
30 resource. According to the December 2005 amendment to the BLM Las Vegas RMP (as part of the BLM
31 Wind Energy Development Program), the project area, which is surrounded by and adjacent to the Piute-
32 Eldorado Valley Area ACEC, does not include lands managed as exclusion or avoidance areas. The
33 closest other SMA to the Proposed Project site is Lake Mead NRA, located 2 miles east of the site.

34 In order to determine construction noise levels at the NRA, computer noise modeling was conducted,
35 utilizing the same methodology as will be discussed in subsequent sections for operational noise. It is
36 anticipated that at most, three WTG sites may be in construction simultaneously. The noise modeling
37 was performed assuming that the three turbine sites closest to the Lake Mead NRA boundary would be
38 under construction simultaneously at the phase that produces the maximum amount of noise. This
39 maximum noise level occurs during excavation of the foundations where up to three excavators are
40 assumed to be operating simultaneously at their maximum noise level producing a combined noise level
41 of about 90 dBA at 50 feet. This is a very conservative assumption because it is unlikely that three
42 excavators would all be at full load simultaneously because construction equipment load varies up and
43 down, and the sound level varies accordingly. Further, it is very unlikely that three sites would have
44 excavation occurring simultaneously. For example, while one site is being excavated, a second may be
45 having concrete placement, a third using cranes to erect the towers, etc. These other phases generate
46 lower noise levels.

1 Based on the above assumptions, a maximum construction noise level of 28 dBA was calculated at the
2 nearest Lake Mead NRA boundary. The maximum noise level is in reality expected to be lower for the
3 reasons presented above, including the fact that it is extremely unlikely that three excavators will be in
4 operation at full load at multiple WTG sites simultaneously. The 28 dBA level is well below the NRA
5 recommended level of 35 dBA for nighttime hours. Most construction will occur during daytime hours.
6 Notably, the maximum 28 dBA levels is calculated for favorable noise propagation conditions (e.g.,
7 nighttime with calm or light winds. During sunny daytime hours, thermal heating of the ground will
8 cause sound waves to bend upwards, greatly reducing the construction related sound at distances, such as
9 those to the NRA boundary.

10 The maximum calculated construction noise level of 28 dBA is generally in the range of the measured
11 ambient conditions within remote areas of the NRA as were provided and discussed in Sections 3.10.
12 Ambient sound levels were generally 15 to 25 dBA, with some peaks to 35 dBA.

13 Impacts from construction-related noise on residential properties and SMAs would be negligible.

14 O&M and Decommissioning. During the O&M phase, the Proposed Project is expected to employ up to
15 15 permanent employees to operate and maintain the facility and provide facility security. Routine
16 maintenance of the wind energy facility would primarily consist of daily visits by maintenance workers to
17 WTG sites. O&M staff would travel in pickups or other light-duty trucks. Most servicing and repair
18 would be performed within the nacelle, without using a crane to remove the turbine from the tower.
19 Occasionally, the use of a crane or equipment transport vehicles might be necessary for cleaning,
20 repairing, adjusting, or replacing the rotors or other components of the WTG. Monitoring the Proposed
21 Project operations would be conducted from computers located in the base of each WTG tower and from
22 the O&M building using telecommunication links and computer-based monitoring.

23 The potential sources of long-term operational noise would stem from the operation of electrical
24 equipment, including the transformers for the WTGs, corona noise from the 230-kV transmission lines,
25 the substations, Western' proposed switching station, and noise from vehicle operations during routine
26 O&M.

27 Noise from electrical equipment, such as transformers, is characterized as a discrete low-frequency hum
28 (Bell and Bell 1994). Among this type of equipment, transformers would be expected to contribute the
29 most to the composite noise at the site. The noise from transformers is produced by alternating current
30 flux in the core that causes it to vibrate (an effect also known as magnetostriction). In addition,
31 transformer cooling fans produce noise when they operate. This noise is produced at a frequency (Hz) of
32 twice the reference line (i.e., $2 \times 60 \text{ Hz} = 120 \text{ Hz}$), which can propagate with favorable weather
33 conditions over long distances with little potential for reduction and create disturbances for residential
34 receptors located at distances of 3,000 to 10,000 feet (Elliot et al. 1998).

35 The relative loudness of transformers depends on the construction design and techniques, as well as the
36 ambient noise levels at a site (Jefferson Electric 2010). The sound level at the closest receptor would
37 dissipate over the long distance, and no measurable change would be detected from current conditions.
38 Therefore, no substantive impacts from transformer-related noise are anticipated.

39 Transmission line corona noise is the noise generated from the strong electric field at the surface of a
40 high-voltage power line conductor ionizing the nearby air, resulting in an audible, continuous, low-level
41 noise or "buzz" during operation of transmission lines and substation equipment. The amount of corona
42 produced by a transmission line is a function of the voltage of the line, the diameter of the conductor, the
43 elevation of the line above sea level, the condition of the conductor and hardware, and the local weather
44 conditions. The interconnection transmission line and Western's proposed switching station would not be
45 audible at the closest sensitive receptor.

46 Potential effects from routine substation, O&M building, and security-related activities on the existing
47 ambient noise levels might be detectable for a short duration at the site and on local roads (due to the

1 minor increase in traffic), but given the relative location of the site with respect to sensitive receptors, any
 2 potential increases in the noise levels on the project site are unlikely to be detectable or of concern to the
 3 general public.
 4 WTG O&M is expected to be the dominant operational noise source, with individual WTG sound power
 5 levels as outlined in Table 4.10-2.

6 **Table 4.10-2. Operation Noise Model Parameters**

Project Element	Type of Source	Sound Power Level at Octave Band Center Frequency (Hz)									A-Weighted	Acoustic Height (meter)
		31.5	63	125	250	500	1,000	2,000	4,000	8,000		
WTG	Point	n/a	83.5	94.4	98.1	102.1	102.1	98.4	91.2	87.2	107	80

Source: Wind Turbine data was provided to URS by Duke Energy Corporation

Note: Sound power level presented is valid for a wind speed of 8 meters per second (mps) referenced to a height of 10 meters above ground level. The A-weighted value is warranted by the manufacturer per Independent Electrical Contractors (IEC) 61400-11:2002 with amendment 1 dated 2006-05.

Hz = hertz; n/a = not applicable;

7 In order to assess impacts, aggregate project O&M noise, predicted with the commercially available
 8 Cadna/A model, is compared with applicable Clark County thresholds. The software takes into account
 9 spreading losses, ground and atmospheric effects, shielding from terrain, barriers and buildings, and
 10 reflections from surfaces. These model capabilities are especially important in an area such as the Project
 11 site, as the effects of the complex terrain can be and were accounted for. By default, the model assumes
 12 that all receptors are downwind of the noise sources simultaneously - a physical impossibility but one that
 13 results in a conservative calculation of maximum expected sound levels. All WTGs operating
 14 simultaneously and operating at the warranted maximum sound output were included in the models, and
 15 all noise was assumed to emanate from turbine hub height (80 meters above the ground).

16 For reference purposes, the following input and calculation parameters were also used in the Cadna/A
 17 model:

- 18 • Maximum search radius = 10 kilometers (km).
- 19 • Ground absorption coefficient = 0.5 (on a scale ranging from 0 to 1).
- 20 • Temperature = 10 degrees Celsius (°C).
- 21 • Relative humidity (RH) = 70%.
- 22 • A 107 dBA PWL per WTG as warranted by the vendor.
- 23 • The model does not include other sources or existing ambient noise because predictions are for
 24 proposed operating WTGs only.
- 25 • While WTG noise is based on wind speed as indicated, model wind speed and direction is
 26 currently neutral.

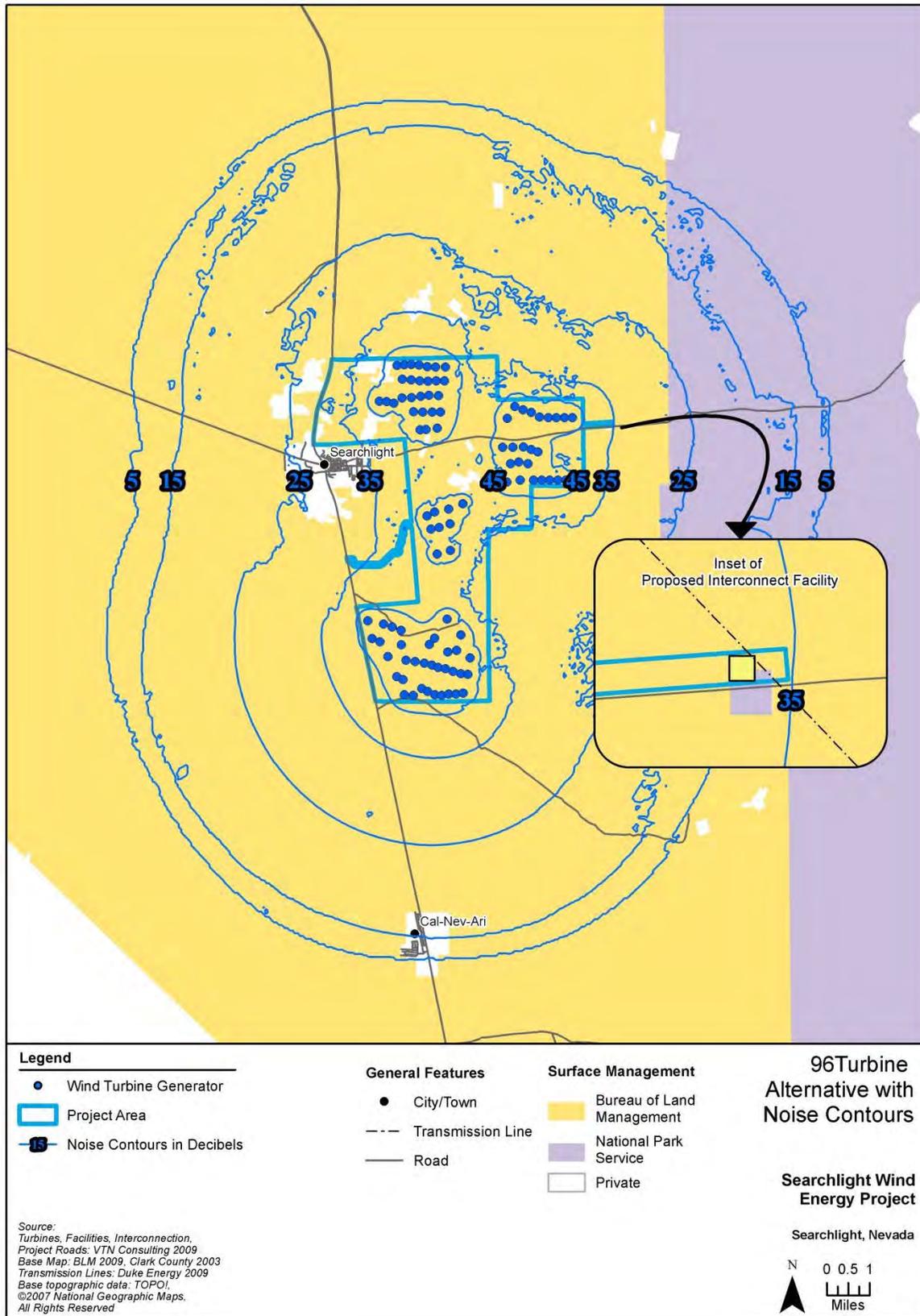
27 Noise prediction results can vary with changes to one or more of the above-listed parameters.

28 Using the values from Table 4.10-2 as inputs, and assuming the conditions on which they are based are
 29 valid for purposes of this analysis, a Cadna/A model generated estimates of predicted aggregate sound
 30 pressure level (SPL) in unweighted dB from all 96 WTGs at each of 10 property line locations where the
 31 highest sound level was calculated for the property. The calculated Project sound levels, and comparison
 32 with the Clark County noise ordinance limit, are shown in Table 4.10-3. The output from the model, in
 33 the form of a noise contour map of the area, is presented as Figure 4.10-1.

1 **Table 4.10-3. Predicted Operation Noise – 96 WTG Layout Alternative**

Searchlight Wind Turbine Project Comparison of Project Sound Level to Clark Noise Standard at Property Line Receptor (dB unless noted)										
Octave Band Center Frequency (Hz)										
Clark Noise Ordinance Limits	31.5	63	125	250	500	1000	2000	4000	8000	Total dBA*
Property Line	65	58	50	44	40	37	33	30	27	46
Parcel 24324000010		57	55	50	50	46	39	26	4	51
Exceeds Standard By			5	6	10	9	6			
Parcel 24324000021		56	54	49	49	45	36	19	0	50
Exceeds Standard By			4	5	9	8	3			
Parcel 24325000003		52	49	44	44	39	30	10	0	44
Exceeds Standard By				0	4	2				
Parcel 24400002013		58	56	51	51	47	41	27	6	52
Exceeds Standard By			6	7	11	10	8			
Parcel 24400002016		51	47	42	41	34	19	0	0	41
Exceeds Standard By					1					
Parcel 24400002023		49	46	41	40	34	20	0	0	42
Exceeds Standard By										
Parcel 24400002021		50	47	42	41	36	24	0	0	40
Exceeds Standard By					1					
Parcel 24400002032		50	46	41	40	35	23	0	0	40
Exceeds Standard By										
Parcel 24900001019		51	48	43	43	39	30	12	0	44
Exceeds Standard By					3	2				
Parcel 25002501001		47	42	36	33	23	0	0	0	34
Exceeds Standard By										
* Presented for informational purposes only. The Clark County Ordinance is octave band based.										

2 Note: dB = decibel; Hz = hertz; SPL = sound pressure level; WTG = wind turbine generator



1

2 **Figure 4.10-1. Noise Contours for the 96 WTG Layout Alternative**

1 Under certain conditions, there is the potential for one or more of the following phenomena to occur that
2 might temporarily cause a variance in the predicted operational sound levels shown in Table 4.10-3:

- 3 • In the Cadna/A prediction model, all studied WTGs were assumed to operate at the same speed.
4 In reality, very slight differences in operating rotor speeds due to non-uniformities in the passing
5 wind profile can result in intermittent constructive and destructive interference—or what one
6 might call temporary “beats,” that can have a perceptible frequency as current research suggests
7 (van den Berg 2006).
- 8 • The atmosphere can either be “stable” or “unstable,” which in summary are descriptors for how
9 layers of air mass interact. The former of these two is usually associated with cold air near the
10 ground that is not well-coupled to higher air masses. This effect can explain why high wind
11 speeds at WTG hub height can be substantially greater than those near ground level (BLM 2009).
- 12 • The RH and variations in ambient temperature have a substantial effect on the attenuation of
13 outdoor sound at high frequencies and long distances through air absorption. Because sound tends
14 to travel farther in colder and more humid conditions, the model uses 10° C and 70% RH in an
15 attempt to make conservative sound level predictions. The variance caused by temperature and
16 humidity tends to increase with increasing distance between a noise source and a receiver.

17 When considered relative to the Clark County Noise Ordinance, maximum sound level thresholds
18 (nighttime, for residential or business/industrial districts as appropriate), the estimated SPLs in Table
19 4.10-3 are in excess by the dB quantities shown. In other words, the estimated WTG O&M noise would
20 exceed the noise ordinance by the presented amounts. In 2011 Clark County approved a Special Use
21 Permit application for the Proposed Project. They found that there were nighttime noise level exceedances
22 at the property line, described above, but that at the actual residence locations the levels were all below
23 the County’s threshold. Therefore, the project was approved by Clark County.

24 Because the list of locations in Table 4.10-3 represent those that are considered closest to the WTGs, it is
25 expected that there would be other property line locations more distant from the WTGs (but on the same
26 boundaries of the identified properties) that could experience impacts of less significance (i.e., excess in
27 decibels lower than the quantities shown in Table 4.10-3).

28 As with construction noise, the Applicant would implement O&M-related noise reduction measures that
29 are compatible with local plans and zoning to the extent practicable, including APMs listed above.

30 Operational sounds after construction would be 35 dBA at the eastern edge of the project footprint near
31 the location of Western’s proposed switching station. Noise at the boundary of the Lake Mead National
32 Recreation Area would be less than the 35 dBA threshold suggested by NPS (Figure 4.10-1).

33 Due to similarities in equipment and activity, noise and vibration generated from project site
34 decommissioning would be similar to but less than those associated with construction - largely due to
35 shorter duration expected from the former. As planned for construction, most decommissioning activities
36 would occur during the daytime, when noise is tolerated better and related activities would be categorized
37 as a form of construction or demolition activity under Clark County’s Noise Ordinance. Noise impacts
38 from decommissioning activities are therefore not anticipated.

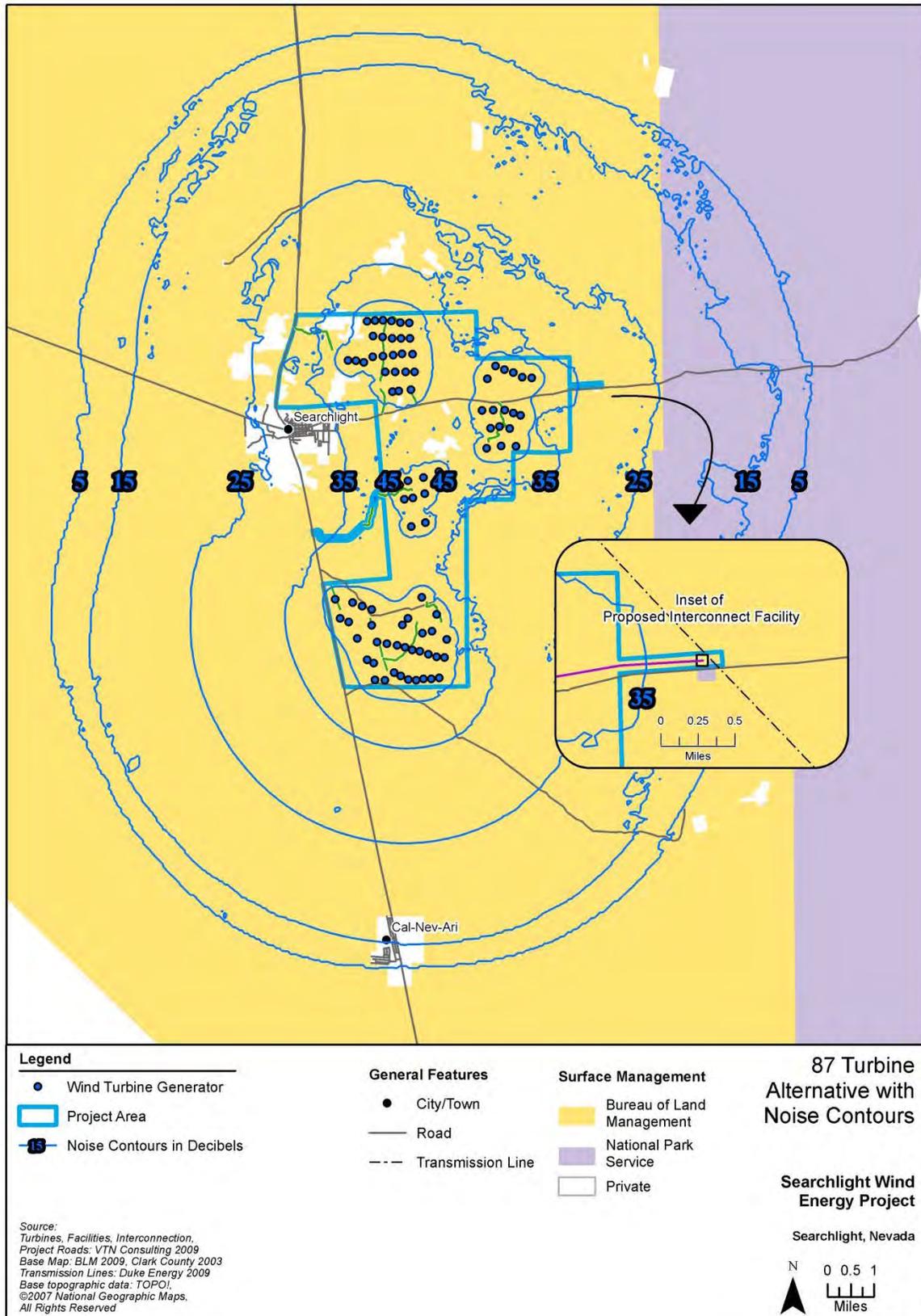
39 **4.10.2.3 87 WTG Layout Alternative**

40 The 87 WTG Layout Alternative would be constructed, operated and maintained, and decommissioned
41 similarly to the 96 WTG Layout Alternative. Impacts under the 87 WTG Layout Alternative would be
42 similar to those identified under the 96 WTG Layout Alternative. There would be fewer WTGs erected
43 under this alternative, but the type, intensity, and duration of the effects would be similar to the 96 WTG
44 Layout Alternative.

1 WTGs are expected to be the dominant operational noise source, with individual WTG sound power
 2 levels as outlined in Table 4.10-2. Using the values from Table 4.10-2 as inputs, and assuming the
 3 conditions on which they are based are valid for purposes of this analysis, a Cadna/A model generated
 4 estimates of predicted aggregate SPL in unweighted dB from all 87 WTGs at each of 10 property line
 5 locations where the highest sound level was calculated for that property. The calculated Project sound
 6 levels, and a comparison to the Clark County ordinance limit, are shown in Table 4.10-4. The output
 7 from the model, in the form of a noise contour map of the area, is presented as Figure 4.10-2.

8 **Table 4.10-4. Predicted Operation Noise – 87 WTG Layout Alternative**

Searchlight Wind Turbine Project Comparison of Project Sound Level to Clark Noise Standard at Property Line Receptor (dB unless noted)										
Octave Band Center Frequency (Hz)										
Clark Noise Ordinance Limits	31.5	63	125	250	500	1000	2000	4000	8000	Total dBA*
Property Line	65	58	50	44	40	37	33	30	27	46
Parcel 24324000010		57	55	50	50	46	39	26	4	51
Exceeds Standard By			5	6	10	9	6			
Parcel 24324000021		56	54	49	49	45	36	19	0	50
Exceeds Standard By			4	5	9	8	3			
Parcel 24325000003		52	49	44	44	39	30	10	0	44
Exceeds Standard By				0	4	2				
Parcel 24400002013		58	56	51	51	47	41	27	6	52
Exceeds Standard By			6	7	11	10	8			
Parcel 24400002016		51	47	42	41	34	19	0	0	41
Exceeds Standard By					1					
Parcel 24400002023		49	46	41	40	34	20	0	0	42
Exceeds Standard By										
Parcel 24400002021		50	47	42	41	36	24	0	0	40
Exceeds Standard By					1					
Parcel 24400002032		50	46	41	40	35	23	0	0	40
Exceeds Standard By										
Parcel 24900001019		51	48	43	43	39	30	12	0	44
Exceeds Standard By					3	2				
Parcel 25002501001		47	42	36	33	23	0	0	0	34
Exceeds Standard By										
Note: Exceedances depicted by values in red text. Blank space indicates compliance.										
* Presented for informational purposes only. The Clark County Ordinance is octave band based.										



1

2 **Figure 4.10-2. Noise Contours for the 87 WTG Layout Alternative**

1 The predicted operational noise exceedances shown in Table 4.10-4 are at several of the closest property
2 line locations. When considered relative to the Clark County Noise Ordinance maximum sound level
3 thresholds (nighttime, for residential or business/industrial districts as appropriate), these estimated SPLs
4 are in excess by the dB quantities shown. In other words, the estimated WTG O&M noise would exceed
5 the noise ordinance by the presented amounts.

6 Because the list of locations in Table 4.10-4 represent those that are considered closest to the WTGs, it is
7 expected that there will be other property line locations more distant from the WTGs (but on the same
8 boundaries of the identified properties) that could experience less noise impacts (i.e., excess in decibels
9 lower than the quantities shown in Table 4.10-4). As with construction noise, the Applicant would
10 implement O&M- and decommissioning-related noise reducing measures that are compatible with local
11 plans and zoning to the extent practicable, including APMs and MMs recommended for the 96 WTG
12 Layout Alternative.

13 Operational sounds after construction would be less than 25 dBA at the boundary of the Lake Mead
14 National Recreation Area - less than the 35 dBA threshold suggested by NPS (Figure 4.10-2).

15 **4.10.3 Mitigation Measures**

16 The Applicant would implement the following mitigation measures to further reduce noise increases:

17 **MM NOI-1: Conduct Construction Activities during Daytime Hours.** The Applicant will conduct
18 construction activity only during daytime hours at the property boundary closest to the nearest
19 residence(s). Construction activities (including truck deliveries, pile driving, and vibration equipment use)
20 shall be restricted to the least noise-sensitive times of day-weekday daytime hours between 7:00 a.m. and
21 10:00 p.m., near residential or recreational areas. Restrictions on air braking, down shift braking, stopping
22 or staging in Searchlight will be enforced in compliance with the local traffic laws and the Traffic Control
23 Plan that will be prepared by the construction contractor for review and approval by NDOT.

24 **MM NOI-2: Turn off Idling Equipment.** The Applicant will turn off idling equipment when not in use.

25 **MM NOI-3: Notify Adjacent Residences.** The Applicant will notify adjacent residents in advance of
26 construction work through public mailings and signs directed toward residents, landowners, and
27 recreational users within 1 mile of the site prior to construction. The notice will state specifically where
28 and when construction activities will occur in the area. The Applicant will also provide a communication
29 line or procedures to enable individuals to contact the contractor in the event that construction noise levels
30 affect them.

31 **MM NOI-4: Install Acoustic Barriers.** The Applicant will install acoustic barriers around stationary
32 construction noise sources as necessary to maintain a noise level not to exceed 43 dBA at the property
33 boundary closest to the nearest residence.

34 **MM NOI-5: Proper maintenance and working order of equipment and vehicles.** Construction
35 equipment will be maintained according to manufacturers' recommendations. The Applicant will ensure
36 that all equipment is adequately muffled and maintained, to include:

- 37 ○ Use of noise controls on standard construction equipment and shielding on impact tools;
- 38 ○ Use of broadband noise backup alarms on mobile equipment; and
- 39 ○ Installation of mufflers on exhaust stacks of all diesel and gas-driven engines.

40 **MM NOI-6: Ensure proper installation of transformer equipment.** The Applicant will ensure proper
41 installation of transformer equipment by:

- 42 ○ Using sound-dampening pads between each transformer and mounting surface;
- 43 ○ Using flexible conduit couplings between each transformer and associated wiring system; and
- 44 ○ Mounting the transformers on surfaces with a large mass to avoid amplifying the sound.

1 **4.10.4 Residual Effects**

2 During construction phases of the Proposed Project, there would be short-term, negligible effects on the
3 nearest human and nonhuman receptors. During O&M and decommissioning phases, there would be
4 long-term effects on the closest receptors, which would be minimize through the implementation of
5 applicable APMs, and MMS described above.

1 **4.11 Recreation Impacts**

2 This section discusses effects on recreation that may occur with implementation of the Proposed Action
3 or alternatives.

4 **4.11.1 Indicators**

5 The Proposed Project would affect recreation if it:

- 6 • Conflicts with existing federal, state, and local recreation management plans and policies;
- 7 • Changes access to existing recreation areas or sites;
- 8 • Changes levels of use for existing recreational areas or sites; or
- 9 • Creates substantial overcrowding to other recreation areas caused by “spill over.”

10 **4.11.2 Direct and Indirect Effects by Alternative**

11 This section describes the effects under each alternative using the respective methodology prescribed
12 under NEPA. To compare effects, this analysis defines the temporal scale (time), spatial extent (area), and
13 intensity of effects for each alternative. All effects discussed in this section are direct. No indirect effects
14 were identified for this resource.

15 The extent and degree of surface disturbance resulting in changes to vegetation, topography, scenery, and
16 the landscape was assessed. Effects on the recreation experience were assessed based on the extent and
17 degree of surface disturbance, user conflicts, the presence of structures, and access for primitive and non-
18 primitive recreation opportunities. The assessment takes into account existing recreation opportunities
19 such as camping, hiking, wildlife viewing, rock climbing, OHV use, and hunting.

20 **4.11.2.1 No Action Alternative**

21 Under the No Action Alternative, the ROW application would be denied and the Proposed Project would
22 not be built; therefore, no project related effects on recreation resources would occur.

23 **4.11.2.2 Proposed Action – 96 WTG Layout Alternative**

24 Under the 96 WTG Layout Alternative, the BLM would approve the ROW applications and the Proposed
25 Action would be carried forward. Effects that could result from the implementation of the Proposed
26 Action during construction, O&M, or decommissioning activities are analyzed in this section. The
27 Applicant has incorporated the following measures (see Table 2.6) to avoid and minimize effects on
28 recreational resources in the Proposed Project area:

- 29 • APM-1 Erosion Control
- 30 • APM-2 Excavation/Grading
- 31 • APM-3 Air/Dust Control
- 32 • APM-5 SPCCP
- 33 • APM-7 Emergency Response Plan
- 34 • APM-8 Waste Management Plan
- 35 • APM-9 Noxious Weed Control Plan
- 36 • APM-10 Site Rehabilitation Plan and Facility Decommissioning Plan
- 37 • APM-14 General Design and Construction Standards

38 Additionally under the Proposed Action, the BLM would authorize Western to construct, operate, and
39 maintain the proposed switching station. Western will require the construction contractor to comply with
40 Environmental Construction Standard 13 for construction of Western’s proposed switching station.

1 **Compliance with Management Goals**

2 The Proposed Project site is within an area of Clark County administered by the BLM LVFO as the
3 Southern Nevada Extensive Recreation Management Area (ERMA), which is managed to provide
4 dispersed and diverse recreation opportunities. Within the project site, the current ROS classification is
5 Roaded Natural, which offers roughly equal opportunities for organized, group recreational activities, or
6 recreation in a natural setting, generally away from other human activities. There would be no change to
7 the status of the ERMA or the existing ROS classification due to implementation of the Proposed Action.

8 Additionally, the Proposed Action and Western's proposed switching station would not have any effect
9 on current management plans or policies within the Nelson Hills/Eldorado SRMA, located near the
10 project vicinity.

11 The Proposed Action construction, O&M, and decommissioning activities are consistent with existing
12 federal, state, and local recreation management plans and policies. Thus there would be no effect on
13 recreation management directives resulting from implementation of the Proposed Action.

14 **Recreation**

15 Construction. During the 8 to 12 month construction phase, grading, excavation, trenching or other
16 ground-disturbing activities, minimal short-term impacts to access to undeveloped recreational areas
17 would occur. Regional and local access to the area would be by way of US-95 and Cottonwood Cove
18 Roads. Access to project facilities would be provided by newly constructed extensions of existing roads,
19 and upgraded existing roads. These roads extend from portions of US-95 and Cottonwood Cove Road.
20 The truck traffic and truck trips associated with the transport of equipment to the Proposed Project area
21 would increase traffic on US-95 and Cottonwood Cove Road, which might result in short-term moderate
22 impacts on motorized travel if traffic flow problems or traffic delays were to occur. Construction of the
23 Proposed Action would result in a short-term increase in traffic volume, which could change the level of
24 access to recreational opportunities within and adjacent to the project site.

25 Access to public lands within the project area might also be temporarily restricted during construction for
26 human and wildlife safety reasons. Construction activities might reduce access to current OHV riding,
27 wildlife viewing, camping, hiking, rock climbing, and hunting opportunities. However, when construction
28 is complete, access roads would be available for public use and could enhance access to areas favorable
29 for these recreational pursuits. Existing access to multiple-use recreational trails and trailhead areas near
30 the Piute-Eldorado ACEC will not be affected by the Proposed Project (Kimley-Horn and Associates
31 2009).

32 Construction might result in a temporary decrease in the visual quality of the recreation setting in
33 localized areas due to the presence of construction equipment and vehicles and associated noise.
34 Construction activities could impact opportunities for solitude and naturalness and reduce the primitive
35 recreation experience in the short term. These activities could also force recreationists to pursue their
36 activities in other areas. However, impacts would be minimal and short term with implementation of
37 APM-1, APM-2, and APM-3. Impacts from construction of Western's proposed switching station site
38 will be mitigated by requiring the construction contractor to comply with Western's Environmental
39 Construction Standard 13

40 Introduction or proliferation of noxious or invasive weeds resulting from earth-disturbing construction
41 activities might affect the natural vegetation communities within the project area, detracting from the
42 natural beauty of the landscape (See Section 4.4.2, Direct and Indirect Effects by Alternative – Non-listed
43 Vegetation). All temporary construction sites, such as laydown areas, are required to be reclaimed after
44 construction, which would restore the recreation setting and experience in the long term. Effects to project
45 area recreational resources and levels of use from construction would be minimized through the
46 implementation of APM-3, APM-7, APM-8, APM-9, and Western's Construction Standard 13.

1 During construction of the Proposed Project, the BLM management of OHV activities within the Piute-
2 Eldorado ACEC, which surrounds and is adjacent to the project area, would continue to be managed
3 under the existing RMP and the terms and conditions of the Biological Opinion for the desert tortoise.
4 These policies limit and restrict activities to designated areas to avoid interfering with MSHCP Covered
5 Species. The range of management activities addressing OHVs that may be coordinated or funded over
6 the life of the permit is listed in Sections 2.8.4 through 2.8.9 of the MSHCP (CCCPD 2000). Impacts on
7 OHV use and experience during construction would be minimal in the short-term, including temporary
8 restriction to limited locations within the project area, visual and noise intrusions, and potential alteration
9 of drainages/dry washes used as OHV routes. These impacts would be minimized with implementation of
10 the APMs and MMs listed above.

11 Approximately 1.5 miles of an existing road, which is an element of the Proposed Project and proposed
12 for upgrading, crosses the northern portion of the Old Spanish National Historic Trail. Construction
13 activities would have minimal but permanent impacts on the trail.

14 Construction activities, laydown areas, or facilities would not affect recreational activities within the
15 ACEC. Temporary decreases in camping, wildlife viewing, rock climbing and hiking opportunities within
16 the project area due to construction activities and vehicle traffic would be minimal and short-term and
17 limited to active construction sites and roads. Implementation of the applicable APMs and MMs listed
18 above would minimize these impacts. Effects to recreation activities are expected to be similar to those
19 discussed above. Impacts to recreation will be minimized through the implementation of Western's
20 Construction Standard 13.

21 O&M and Decommissioning. Access to the project area during O&M would not be restricted and 29
22 miles of new and improved roads would allow for greater access to the area. Most access roads to O&M
23 facilities would be open to motorized travel. O&M vehicles that access the project area for routine
24 maintenance would have minimal impacts on public access to recreation activities in the area. Barriers
25 would be placed where the transmission line ROW intersects local roads to prevent unauthorized use onto
26 the transmission line ROW for human and wildlife safety reasons. This would limit access for public
27 motorized travel in localized areas in the long-term. Impacts to access during decommissioning would be
28 similar in type, intensity and duration as during construction. Effects on access to recreational
29 opportunities during construction, O&M, and decommissioning would be minimized through the
30 implementation of APM-10 and APM-14.

31 The physical presence of 96 WTGs and ancillary facilities including 2 substations, transmission lines,
32 Western's proposed switching station, and access roads could result in long-term impacts on the
33 recreation setting and experience. The presence of these facilities and associated vehicle traffic would
34 create visual contrasts across the landscape and degrade the quality of the recreation setting (See Section
35 4.10, Visual Resources Impacts). Opportunities for solitude and a primitive recreation experience would
36 be reduced by O&M and decommissioning-related noise, and access could be temporarily limited for
37 recreation activities in localized areas. The presence of WTGs and ancillary facilities, transmission lines,
38 and roads, and the noise potentially created by them could impact big game and upland game wildlife
39 habitat and reduce wildlife viewing and hunting opportunities. Implementation of the relevant APMs
40 would minimize these impacts on wildlife habitat and populations.

41 Temporary impacts on the recreation setting and experience might occur from surface disturbing
42 decommissioning activities, which could serve to increase the proliferation of noxious or invasive weeds.
43 As with similar construction activities, implementation of applicable APMs and MMs listed above during
44 decommissioning would serve to minimize these impacts.

45 Activities associated with O&M would not affect recreational activities that occur within the Piute-
46 Eldorado ACEC. Approximately 159 acres of the total 18,949 acres proposed for the project would be
47 unavailable for recreational pursuits after construction. Impacts to recreational activities such as camping,
48 wildlife viewing, rock climbing and hiking within the Proposed Project area during O&M would be

1 minimal and intermittent as described above. Impacts on recreational activities during decommissioning
2 would be the same type, intensity, and duration as during construction. Implementation of the applicable
3 APMs listed above would minimize these impacts.

4 It is possible that some existing recreation users in the project area will chose to recreate in other locations
5 due to the presence of construction, O&M, and decommissioning activities and facilities. The permanent
6 use of approximately 160 acres for project facilities would not substantially impact the project area's
7 potential recreation opportunities or areas. Overcrowding of those pursuing recreational activities in other
8 locations outside of the Proposed Project area is unlikely.

9 **4.11.2.3 87 WTG Layout Alternative**

10 Effects under the 87 WTG Layout Alternative would be similar to those identified under the 87 WTG
11 Layout Alternative. The temporarily disturbed area (approximately 230 acres) and permanently disturbed
12 area (approximately 152 acres) would be decreased under this alternative due to installation of 9 fewer
13 WTGs. The presence of WTGs and ancillary facilities, and associated vehicle traffic, would create visual
14 contrasts across the landscape and degrade the quality of the recreation setting. The type, intensity, and
15 duration of effects from construction, O&M, and decommissioning activities on recreational activities
16 would be similar to the 96 WTG Layout Alternative. Impacts on the recreation setting and experience
17 would be slightly less than the Proposed Action due to the decrease in the number of proposed WTGs.
18 The equivalent APMs and MMs implemented under the Proposed Action would be applicable under the
19 87 WTG Layout Alternative to minimize effects on recreation resources.

20 **4.11.3 Mitigation**

21 To further reduce impacts on recreation, the following measures would be implemented:

22 **MM REC-1: Recreation Impacts Minimization Measures.** The Applicant and their contractor(s) shall
23 reduce recreation impacts during construction by:

- 24 • Clearly delineating construction boundaries and minimizing areas of surface disturbance;
- 25 • Preserving vegetation to the greatest extent possible;
- 26 • Utilizing undulating surface disturbance edges;
- 27 • Stripping, salvaging and replacing topsoil;
- 28 • Employing contoured grading;
- 29 • Controlling erosion;
- 30 • Using dust suppression techniques;
- 31 • Restoring exposed soils as closely as possible to their original contour and vegetation; and
- 32 • Preserving access to roads and trails in the project area that are used for recreational purposes.

33 **4.11.4 Residual Effects**

34 There would be moderate residual impacts on the recreation setting and experience resulting from the
35 long-term presence of WTGs, transmission lines, and access roads.

4.12 Socioeconomic Impacts

This section discusses effects on socioeconomic resources that may occur with implementation of the Proposed Action or alternatives. First, the indicators used to identify and analyze effects are presented, and second, potential effects are discussed. The discussion format is organized separately for both social and economic conditions.

4.12.1 Indicators

For the purposes of this analysis, the Proposed Action would affect social and economic conditions if it would:

- Result in a permanent or temporary population increase larger than local services, infrastructure, or population can accommodate; or
- Result in a tax burden to local residents not offset by the Proposed Action’s generation of new public revenues.

NEPA provides no specific thresholds of significance for socioeconomic impact assessments. Significance varies based on the setting of the Proposed Action (40 CFR 1508.27[a]), but 40 CFR 1508.8 states that indirect effects may include those that are growth-inducing and others related to induced changes in the pattern of land use, population density, or growth rates. In addition, the regulations state, “Effects include....cultural, economic, social, or health, whether direct, indirect, or cumulative. Effects may also include those resulting from actions which may have both beneficial and detrimental effects, even if on balance the agency believes that the effect would be beneficial” (40 CFR 1508.8).

A number of issues that were identified in the Public Scoping Summary Report relating to socioeconomics form the basis for the assessment of potential effects. These include impacts on tourism in the area, property values, local jobs, and the economic quality of life for Searchlight residents and future economic growth.

The selection of an appropriate study area is important for regional economic analyses because the size of economic impacts is directly dependent on the size of the economy being analyzed. For purposes of economic impact modeling, the Searchlight Project Impact Region (SIR) has been defined as all of Clark and Mohave counties. While Boulder City and Laughlin/Bullhead City have relatively complete retail sectors, much of the impact would necessarily occur in the northern part of the region in and around Las Vegas, especially for purchases of larger and more technical construction services.

Direct economic impacts were estimated initially by developing detailed construction and operations budgets, with particular attention paid to the proportion of spending that might occur within the two-county region versus being imported into the region. These budgets, summarized in the analysis below, are the foundation for analyzing the region with and without the Proposed Project.

Total economic effects include direct effects attributed to the activity being analyzed, as well as the additional indirect and induced effects resulting from money circulating throughout the economy.⁴ Because the businesses within a local economy are linked together through the purchase and sales patterns of goods and services produced in the local area, an action that has a direct impact on one or more of the local industries is likely to have an indirect impact on many other businesses in the region. For example, an increase in construction leads to increased spending in the adjacent area. These

⁴ Direct economic effects refer to changes in output, income, and employment attributed to the expenditures and/or production values specified as direct final demand changes. Effects are not the same as economic benefits, because effects are generated with inputs that would have an economic value in other uses. These opportunity costs must be deducted from effects to get the net economic benefits to society (or net changes in social welfare) that are used in benefit-cost analysis.

1 additional effects are known as the indirect economic impacts. As household income is affected by the
2 changes in regional economic activity, additional impacts occur. The additional effects generated by
3 changes in household spending are known as induced economic impacts.

4 The regional economic impacts of the Proposed Project were estimated using IMPLAN (Impact Analysis
5 for Planning), an economic input-output (I-O) model⁵. This model is a standard in the industry and is
6 commonly used in BLM planning. For this analysis, a 2008 economic model for Clark and Mohave
7 counties was constructed by Dr. Tom Harris of the University of Nevada-Reno using IMPLAN software
8 and data, and used to estimate economic impacts of the Proposed Project.

9 IMPLAN input-output models provide three economic measures that describe the economy: output, labor
10 income, and employment. Output is the total value of the goods and services produced by businesses in
11 the county. Labor income is the sum of employee compensation (including all payroll costs and benefits)
12 and proprietor income. Employment represents the annual average number of employees, whether full-
13 time or part-time, of the businesses producing output.

14 The costs of the Proposed Project and related assumptions, including spending estimates, locations of
15 materials and services to be purchased, and use of local labor, were defined through communication with
16 the Applicant and Western. It is important to remember that these cost estimates are snapshots that
17 simplify dynamic market conditions that will be fluctuating up to the time of construction. The cost
18 estimates are used as inputs to the IMPLAN model. All monetary values are reported in 2011 dollars,
19 unless otherwise specified.

20 Assumptions used to analyze potential effects of the Proposed Project on socioeconomic conditions
21 include the following:

- 22 1. A social discount rate of 3.0% is assumed for purposes of estimating the present value of various
23 cost and revenue streams. Present value represents the current value of the future stream of
24 output and income impacts. Future monetary values are discounted because society values
25 money in the present more than the same amount of money at a future date. This social discount
26 rate represents a long-term, inflation-free, and tax-free rate of return on investments.
- 27 2. Construction costs exclude debt financing costs. These are normally paid to financial institutions
28 outside the region and do not affect local impacts.
- 29 3. Construction costs are based on 87 and 96 WTGs, each with a 2.3 MW capacity.
- 30 4. An 8- to 12-month construction period is assumed for the Proposed Project.
- 31 5. All costs and revenues are stated in 2011 constant dollars.
- 32 6. Project costs and revenues have been tailored to the project as specifically as possible, but many
33 are representative costs or revenues taken from similar projects.
- 34 7. The economic life of the project is 25 years.
- 35 8. Royalty lease payments to BLM will occur at the rate of \$4,155 per MW of installed capacity as
36 set by the agency.
- 37 9. The project will qualify for Nevada property tax and sales tax abatement programs for renewable
38 energy projects.
- 39 10. There is a 20% salvage value for the project after 25 years.

⁵ The IMPLAN model consists of commercial software and region-specific economic data, which are maintained and distributed by the Minnesota IMPLAN Group, Inc., <http://implan.com/v3/>

4.12.2 Direct and Indirect Effects by Alternative

This section describes the effects under each alternative using the respective methodology prescribed under NEPA.

The economic impacts of one-time activities that happen during construction differ from the impacts of the activities that occur during project operation. Economic impacts are therefore reported separately for the construction and operation phases of each alternative. Economic impacts are further organized into direct and total effects. Direct effects refer to the impacts of economic activities generated directly by expenditures from the Proposed Project, while total effects also capture indirect effects and induced effects. The size of indirect and induced impacts depends on the proportion of goods, services, and labor that are provided from Clark and Mohave counties and not imported from outside the region. The higher the proportion of inputs provided locally, the larger the local economic impacts.

4.12.2.1 No Action Alternative

Under the No Action Alternative, the BLM would not grant the ROWs to the Applicant and Western, and thus there would be no change in existing socioeconomic conditions. The land would retain its rural desert qualities, and the habitats supporting ecosystems and species would not be altered from project-related encroachments. The purpose and need for the Proposed Project would be provided by other means. Under the No Action Alternative, the utility off-taker (the utility or bulk power purchaser and/or distributor) would not have access to the energy supply that would have been produced by the Proposed Project. Alternative renewable energy-generation projects developed elsewhere might not alleviate the Applicant's concerns for reliability, cost, and the environmental sustainability of this resource. Likewise, under the No Action Alternative, final end-use retail consumers would not experience any positive sense of social well-being because this alternative would not involve construction and operation of the wind energy facility and delivery of emission-free power. The socioeconomic well-being of project construction and O&M workers and suppliers to the renewable energy industry would not be favorably affected under this alternative since the Proposed Project would not be built and operated.

4.12.2.2 Proposed Action — 96 WTG Layout Alternative

Social Impacts

This section discusses potential effects on the social well-being of area stakeholders. Effects on the social welfare of these groups might potentially occur during implementation of either action alternative. Potential social effects described in terms of effects on social well-being relate to the manner in which a particular social group, individual, or stakeholder interprets how the Proposed Action or alternatives might affect their environment and how such an effect relates to the integrity, quality, use, and enjoyment of socioeconomic resources.

Public comments received and evaluated during the public scoping process were reviewed to determine the values and quality of life concerns of stakeholder groups. These concerns form the backdrop against which project phases are evaluated for how each element could potentially influence the social well-being of the groups. Resources are broadly defined and can include, for example, historically used open spaces and quality habitat supporting recreation and wildlife appreciation and other resources necessary to maintain the historic quality of life that influences the social well-being of these stakeholders. Social well-being can potentially be affected by each phase of the Proposed Project (construction, O&M, and decommissioning). Social well-being can also be influenced by the level of participation and perceived degree of control that stakeholders have over their environment, its resources, and the government institutions that have stewardship obligations to manage these resources in a sustainable manner.

1 **Demographics and Social Trends**

2 **Population**

3 Construction. The construction phase of the 96 WTG Alternative is expected to have a short-term,
4 beneficial impact on the Clark County population level. The impact would not cause a temporary
5 population increase necessitating additional local public services or investment in infrastructure capacities
6 that could not be provided from existing resources. During the peak of the construction period, the
7 workforce could reach 250 to 300 workers. This would represent a negligible temporary increase in Clark
8 County population where housing and infrastructure is designed for peak demands and fluctuations in
9 global tourism.

10 O&M and Decommissioning. The operational phase of the 96 WTG Alternative is expected to have a
11 long-term, beneficial impact on the area's population level. When constructed and operational, the
12 Proposed Action would require up to 15 permanent staff to operate and maintain the facility.

13 **Housing**

14 Construction. The construction phase of the 96 WTG Alternative is expected to have a short-term,
15 beneficial impact on the Clark County permanent and temporary housing stock. The impact would not
16 cause a temporary strain and necessitate additional local public services or investment in public
17 infrastructure capacities that could not be provided from existing resources. Sufficient temporary housing
18 should be available within the Greater Las Vegas/Clark County area to accommodate nonlocal workers
19 and their families/dependents during the length of their construction phase tenures. The small incremental
20 demand from these workers would be beneficial to the housing and lodging sectors that have been
21 negatively affected by the recession.

22 There is a possibility that some construction workers could choose to live in trailers or recreational
23 vehicles (RVs). The nearest possibility would be some of the 149 sites available within the Cottonwood
24 Cove Resort within the Lake Mead Recreation Area. However, the maximum stay within the recreation
25 area is limited to 90 days within any consecutive 12-month period therefore it is more likely the workers
26 with trailers or RVs would stay at an RV Park in Cal-Nev-Ari about 17 miles away or in Boulder City, the
27 Las Vegas Valley, Laughlin, or Bullhead City, Arizona.

28 O&M and Decommissioning. The operational phase of the 96 WTG Alternative is anticipated to have a
29 long-term, beneficial effect on the area's housing stock. The Proposed Action would permanently employ
30 up to 15 full-time workers, which the Applicant anticipates would be local workers from the region and
31 permanent residents. Therefore, the housing impact would be negligible; however, any incremental long-
32 term stimulus provided from net migration to the housing sector would be beneficial for the economy.
33 Some permanent workers could relocate to the Clark County area and would be expected to either
34 purchase or lease homes during their long-term work tenures.

35 **Affected Groups and Attitudes**

36 **Public Land Recreational Users / Off-Highway Vehicle Users / Organizations and** 37 **Supporting Industries**

38 Under the 96 WTG Alternative, recreational users would experience a limited impact on the open space
39 currently available to them within the project vicinity to pursue activities such as horse and OHV riding,
40 hiking, and flora and fauna viewing. The resources attracting these users would be affected by the
41 Proposed Project site footprint which would remove use of some public lands from recreational use and
42 could change the historic relationship for recreational users. There is a possibility that some negative
43 aspects of social well-being associated with the use and enjoyment of select acreage of habitat or OHV
44 and/or hiking range that is absorbed or altered by the project site could be compromised on both a short-
45 term and long-term basis. This social unease could relate to feelings of insecurity about open lands
46 shrinking, thereby removing them from the stock of lands that have historically been available to

1 stakeholders. However, mitigation measures would reduce these potential negative social well-being
2 effects (see Section 4.11, Recreation Impacts).

3 ***Environmental Groups and Stewards***

4 Under the 96 WTG Alternative , the Proposed Project site could change the historic relationship that this
5 stakeholder group has with public lands, as loss of desert open space areas would affect vegetation and
6 wildlife communities and habitat. APMs and mitigation measures for vegetation and wildlife (see Section
7 4.4, Biological Resource Impacts) would reduce potential effects.

8 ***Project Construction Workers and Suppliers to the Renewable Energy Industry***

9 Under the 96 WTG Alternative, construction workers and suppliers to the utility-scale wind energy
10 facility installation industry have a vested interest in seeing the Proposed Action through to completion.
11 The social well-being of this group would be enhanced because the construction phase mobilization of
12 manpower, materials, equipment, and supplies would provide a much needed stimulus to this sector of the
13 regional economy. Although the construction phase of the Proposed Action would be short term, the
14 sense of positive social well-being would arise from the participation of this group in the industry's
15 development and the experience of having worked on a utility-scale project. Positive social well-being
16 also comes with developing experience and knowledge of utility-scale installation (and best construction
17 practices) of wind energy assets that can potentially lead to future contracts in this growing industry.
18 While the Proposed Action would require fewer workers during the O&M phase, it would continue to
19 provide social well-being for these workers.

20 ***Utility Off-Taker and End-Use Energy Consumers***

21 Under the 96 WTG Alternative, both the utility off-taker and end-use energy consumers would experience
22 social well-being from the reliability, cost, and sustainability benefits generated by the Proposed Project's
23 renewable energy production.

24 ***Local Private Land Owners/Residents/Large Lot Owners***

25 The social attitudes within this stakeholder group are diverse, and the likely social welfare effects that
26 arise under each alternative would be varied. Under the Proposed Action, members of this stakeholder
27 group who support the full-scale development of renewable energy potential on public lands would feel
28 validated and their sense of social well-being would be enhanced. Conversely, those who oppose
29 renewable energy development at this location could experience the opposite feelings.

30 ***Economic Impacts***

31 Construction. The economic impacts generated during construction of a wind energy project are related to
32 the mix of inputs required to construct the Proposed Action. Capital equipment and construction-related
33 materials are purchased both locally and outside the Proposed Project region. Construction labor
34 generates jobs and associated labor income. Much of the labor is hired within the project region, but it is
35 very common for a significant amount of specialized labor to be brought into the region from elsewhere
36 (e.g., WTG erection crews). To quantify the effects of construction on the regional economy, it is
37 necessary to identify and quantify the mix of inputs required to construct the Proposed Project. This was
38 achieved through conversations with the Applicant, who relied on their experience constructing and
39 operating other representative wind energy projects in the western United States to develop budgets
40 specific to this project.⁶ Construction impacts are temporary, lasting through a single construction season
41 of 8 to 12 months.

⁶ E-mails and phone conversations with Searchlight Wind Energy Project Manager Bob Charlebois and with Cost Engineer Dan Depperman on various dates in 2010 and 2011.

1 For wind energy projects, typical construction inputs include major capital equipment (e.g., WTGs,
2 towers, and transmission equipment), construction materials (e.g., concrete, rebar, and road aggregate),
3 electrical equipment and supplies (e.g., transformers and wiring), soft costs (e.g., planning, permitting,
4 and engineering), and construction labor. Table 4.12-1 presents a summary of the 96 WTG Layout
5 Alternative construction expenditures.

6 **Table 4.12-1. Summary of Project Construction Expenditures with the 96 WTG Layout**
7 **Alternative**

Construction Input	Total Cost	Local Expenditures	Local %
Nonlabor			
WTGs, including transportation	\$216,070,000		0.0%
Roads and foundations	\$19,510,000	\$9,750,000	50.0%
Cables and electrical connections	\$14,920,000	\$520,000	3.5%
Interconnection switching station	\$7,730,000	\$390,000	0.0%
Balance of plant (construction, engineering, administration, etc.)	\$26,100,000	\$960,000	3.7%
Nonlocal labor living expenses		\$3,240,000	100.0%
Nonlabor Subtotal	\$284,330,000	\$14,860,000	5.2%
Labor			
WTGs	\$7,830,000	\$2,120,000	27.0%
Roads and foundations	\$3,990,000	\$1,270,000	31.8%
Cables and electrical connections	\$12,310,000	\$3,090,000	25.1%
Interconnection switching station	\$2,810,000	\$480,000	17.1%
Balance of plant (construction, engineering, administration, etc.)	\$10,870,000	\$2,010,000	18.5%
Labor Subtotal	\$37,810,000	\$8,970,000	23.7%
Total Construction Costs	\$322,140,000	\$23,830,000	7.4%

8 In sum, the total construction expenditures of the Proposed Action are estimated to be over \$322 million,
9 excluding debt financing and sales tax. The largest single expenditure is for the WTGs (including blades
10 and towers), which cost about \$216 million delivered onsite and account for 67% of total project costs.
11 Direct labor costs are estimated to be nearly \$38 million, with about \$27 million in labor payments for
12 installation of the roads, foundations, wind turbines, and electrical connections, including substations, and
13 \$10.9 million for other planning and construction activities. Of the total project costs, \$274.5 million, or
14 92.6% of expenditures, would be for equipment and labor located outside the project region. Note that
15 while the local living expenses of Applicant employees or contractors is included in local expenditures,
16 there would be additional local spending for housing and meals by nonlocal construction personnel,
17 which are estimated to be \$3.1 million.

18 The total economic impacts of construction of the 96 WTG Layout Alternative are the sum of direct,
19 indirect, and induced effects (see Table 4.12-2). They reflect the specific construction costs as well as
20 inter-industry linkages and representative household spending patterns that characterize the Clark and
21 Mohave counties' economy. Although the total project cost is estimated at \$322 million, the direct
22 economic output in the SIR would be the \$23.8 million of local expenditures. This direct impact would
23 create indirect impacts of \$7.1 million and induced impacts of \$8.9 million, for a total temporary
24 economic impact on output of \$39.8 million during the year of construction. This would generate a total
25 increase in labor income of \$14.1 million. An estimated 300 full- and part-time jobs would be created
26 directly by the project's construction. Note that a single construction worker or heavy equipment operator

1 might hold multiple temporary jobs on the Proposed Project as it proceeds through various tasks for
 2 completion. The direct employment would generate an additional 47.9 jobs indirectly and induce another
 3 67.3 jobs for a total of 415.2 temporary and full-time jobs during the construction period. To maximize
 4 the socioeconomic benefits of the Proposed Project on the local communities, to the extent possible, the
 5 Applicant, Western, and their contractors could hire qualified employees and qualified service vendors
 6 from the surrounding communities.

7 **Table 4.12-2. Construction Impacts for the 96 WTG Layout Alternative**

Economic Impact	Direct Impact	Indirect Impact	Induced Impact	Total Impact
Output (millions 2011\$)	\$23.8	\$7.1	\$8.9	\$39.8
Labor Income (millions 2011\$)	\$9.0	\$2.5	\$2.6	\$14.1
Employment (full- and part-time temporary jobs)	300	47.9	67.3	415.2

Note: Totals may not add due to rounding.

8 O&M and Decommissioning. When operational, the Proposed Project would generate ongoing O&M
 9 activities that would result in long-term economic impacts on Clark and Mohave counties. Annual O&M
 10 are estimated to require \$8.12 million (excluding taxes and debt service costs), of which \$2.95 million
 11 would be expended locally (Table 4.12-3). These annual local expenditures would continue over the 25-
 12 year life of the Proposed Project. Over half of total expenditures would be for materials and services not
 13 produced locally (such as replacement parts for WTGs). However, \$500,000 in annual purchases would
 14 be made locally for routine hardware and electrical supplies, lubricants, fuel and utility services, and
 15 nonlocal labor living expenses. Wisser and Bolinger (2011) note that project O&M costs tend to increase
 16 over time as WTGs age, component failures become more common, and warranties expire, so the O&M
 17 costs in this analysis may be conservative for the life of the project.

18 **Table 4.12-3. Summary of Project Annual Operations Expenditures for 96 WTG Layout**
 19 **Alternative**

Cost Category	Total Cost	Materials Expenditures	Labor Expenditures	Total Local Expenditures	Local %
Turbine warranty and O&M expenses	\$3,680,000	\$150,000	\$590,000	\$740,000	20.1%
Balance of plant O&M expenses	\$2,090,000	\$80,000	\$1,530,000	\$1,610,000	77.0%
Other O&M expenses	\$600,000	\$210,000	\$340,000	\$550,000	91.7%
BLM land lease payment	\$920,000	\$0	\$0	\$0	0.0%
Insurance	\$850,000	\$0	\$0	\$0	0.0%
Nonlocal labor living expenses		\$50,000		\$50,000	100.0%
Annual Total	\$8,150,000	\$500,000	\$2,460,000	\$2,950,000	36.2%

Notes:

1. Property tax of \$1,279,000 in first year not included.
2. Totals may not add due to rounding.
3. Adjusted to 2011 dollars using forecasts of Gross Domestic Product (GDP) Implicit Price Deflator from Institute for Housing Studies (IHS) Global Insight's April 2011 baseline forecast
4. Nonlocal labor living expenses estimated to be 15% of wages.

1 Implementation of the 96 WTG Layout Alternative would support permanent, full-time employees,
 2 including management, administrative, and staff for security and O & M on project facilities. The
 3 majority of these positions would be with the WTG manufacturer in support of the WTG service and
 4 maintenance warranty. Many of these jobs would be local hires, particularly if a wind technician training
 5 program is offered at a nearby higher education institution. At the expiration of the warranty, these jobs
 6 would either be transferred to the owner for long-term maintenance of the WTGs, remain with the
 7 manufacturer in the form of a long-term maintenance contract, or be transferred to a third party
 8 maintenance firm. The total payroll for these positions, including benefits, is estimated to be
 9 approximately \$2.5 million per year. It is assumed all project staff would reside permanently in Clark or
 10 Mohave counties when the facility is operational. To maximize the socioeconomic benefits of the
 11 Proposed Project on the local communities, the Applicant, Western and their contractors could hire
 12 qualified employees and qualified service vendors from the surrounding communities to the extent
 13 possible.

14 The Applicant would also make annual lease payments of \$920,000 to the BLM for WTGs and other
 15 facilities. The BLM lease payments are specified at a rate of \$4,155 per megawatt of installed nameplate
 16 capacity (BLM 2008b). Payments to the BLM for the WTGs on federal lands are not retained in the
 17 LVFO, and so are assumed to be expended outside the two-county region.

18 The direct expenditures described above were run through the two-county IMPLAN model to generate the
 19 estimated impacts in Table 4.12-4. The addition of indirect and induced impacts to the \$2.95 million in
 20 local expenditures would create a total annual impact of \$4.9 million in economic output for the two-
 21 county region. Labor income would be increased by \$3.1 million annually. An estimated 18.0 full-time
 22 and part-time jobs would be created directly by project O&M. Note that these are not all direct hires by
 23 the project operator, but may be employed by vendors serving the Proposed Project. Indirect impacts
 24 would add another 1.2 jobs and induced impacts another 13.4, for a total impact of 32.6 permanent full-
 25 and part-time jobs.

26 **Table 4.12-4. Summary of Annual Operations Impacts for the 96 WTG Layout Alternative**

Economic Impact	Direct Impact	Indirect Impact	Induced Impact	Total Impact
Output (millions 2011 \$)	\$2.95	\$0.19	\$1.78	\$4.92
Labor income (millions 2011 \$)	\$2.46	\$0.07	\$0.57	\$3.10
Employment (full- and part-time jobs)	18.0	1.2	13.4	32.6

Notes:

1. Totals may not add due to rounding.

2. Does not include impacts of local expenditure of property tax revenue.

The impacts of project operations do not include the impacts created by local government spending the additional property tax revenues to provide local services to residents, or the impacts of sales tax distribution to local school districts. These expenditures would also ripple through the local economy.

27 **Economic Impacts Summary**

28 Total regional economic impacts of each phase of project construction and O&M with the 96 WTG
 29 Layout Alternative are presented in Table 4.12-5. Table 4.12-5 also presents the total economic impacts
 30 of the Proposed Action in present value terms. Present value represents the current value of the future
 31 stream of output and income benefits. By discounting future values, impacts can be analyzed in terms of
 32 current dollars. The discount rate used in this analysis is 3% (which means that \$100 next year is
 33 equivalent to \$97 this year).

1 **Table 4.12-5. Summary of Estimated Impacts of 96 WTG Layout Alternative**

Economic Impact	Construction (one-time)	Operations (Annual)	Present Value Project Total
Output (millions 2011\$)			
Direct effects	\$23.8	\$3.0	\$73.8
Indirect effects	\$7.1	\$0.2	\$10.3
Induced effects	\$8.9	\$1.8	\$39.0
Total Output Effects	\$39.8	\$4.9	\$123.1
Labor Income (millions 2011\$)			
Direct effects	\$9.0	\$2.5	\$50.6
Indirect effects	\$2.5	\$0.1	\$3.7
Induced effects	\$2.6	\$0.6	\$12.3
Total Income Effects	\$14.1	\$3.1	\$73.3
Employment (Jobs)			
Direct effects	300.0	18.0	
Indirect effects	47.9	1.2	
Induced effects	67.3	13.4	
Total Employment Effects	415.2	32.6	

Notes:

1. Totals may not add due to rounding.
2. Employment includes both full- and part-time jobs.

2 The present value of direct, indirect, and induced economic output generated in the two counties by the
3 Proposed Action construction and O&M over the life of the project is estimated at \$123.1 million. This
4 economic activity generates labor income to the region's residents of \$73.3 million over the 25-year life
5 of the Proposed Project, as well as employment of 415.2 full or part-time temporary jobs in the
6 construction years and 32.6 full or part-time permanent jobs each year of full operation.

7 ***Economic Impacts after Expected Project Life***

8 The Proposed Action would have an expected project life of 25 years. Given that the construction of the
9 Proposed Project would take place over the first year, this means the useful life of the project ends after
10 Year 26. Beginning Year 27, one of three scenarios could happen (as presented in the following
11 subsections) that would carry positive economic impacts for the region. It is worth noting that economic
12 impacts in Year 27 would still carry a present value of 45% at a 3% discount rate. This means that any of
13 the three scenarios discussed below would have economic impacts with meaningful value today.

14 ***Useful Life Extends Beyond 25 Years***

15 Perhaps the most likely scenario is that the WTGs could continue to function beyond 25 years. In fact, the
16 term of the proposed ROW grant is for 30 years. At this point of the wind energy industry's rapid
17 development, there is uncertainty about the length of useful life. Under this option, a few WTGs might
18 fail but most would continue to generate electricity. The same O&M would be needed and might even
19 increase with efforts to rehabilitate WTGs. The streams of economic value, spending, and tax revenues
20 would continue. This option is a temporary condition, likely to last one to several years.

21 ***Project Repower, New Infrastructure***

22 In a second possible scenario after Year 26, the existing WTG components and other infrastructure could
23 be replaced. The cost would be significantly less than the cost of the original project, but would approach
24 \$200 million, based on the construction costs in Table 4.12-1. The technology that will exist in Year 27 is
25 unknown, but it is likely that the new WTGs would generate more electricity and thus provide greater
26 streams of continuing impacts from operation than the original Proposed Project.

1 **Project Decommissioning**

2 The third possible scenario is that the Proposed Project would be decommissioned sometime after Year
3 26. Significant local labor is likely to be used in the deconstruction and land restoration, providing large
4 temporary economic impacts to the region's economy. Because of the relative youth of the wind energy
5 industry, there are no data and considerable uncertainties around the cost of decommissioning, but
6 decommissioning is a requirement of project construction permits.

7 **Economic Impacts Outside the Searchlight Impact Region**

8 The economic impacts of the Proposed Action would clearly extend beyond the project region. The
9 expenditure of \$275 million outside the region on large capital equipment like the WTGs and towers
10 would generate hundreds of jobs for the U.S. and world economies (depending on where the materials are
11 produced and how they are transported)⁷. In addition, many of the local purchases would be for goods
12 imported into the region for resale. To the extent that local labor is not available and/or specialized labor
13 is needed, workers would be drawn in from surrounding counties and/or states with larger and more
14 diverse construction work forces. The payroll for labor purchased outside the region is nearly \$30 million.
15 This would result in employment benefits and generate wage earnings that are leaked outside the county,
16 thereby benefiting other regional economies.

17 Project O&M would generate a number of positive economic impacts outside the region. There are over
18 8,000 precision parts in a single WTG, and approximately half of those components are manufactured in
19 the U.S. (Ayee et al. 2009). Purchases of parts, equipment, and services for O&M outside the region
20 would generate jobs and income in the areas where they are procured. The electricity produced by the
21 Proposed Project would facilitate development in the areas where it is consumed, such as southern
22 Nevada, to the extent that electricity supply is a limiting factor. Finally, there are positive environmental
23 externalities generated to the extent that the power produced by the Proposed Project would replace more
24 polluting thermal energy and thereby reduce U.S. carbon emissions (see Section 4.6, Air Quality and
25 Climate Impacts).

26 **Fiscal Impacts**

27 An important part of project analysis is to look at the fiscal impacts to units of local government with and
28 without the project. These impacts can either be increased revenue streams to local government from
29 property taxes, sales taxes, and the like, or impacts can be costs incurred by government for the provision
30 of public services needed by the project. Typical public services needed during construction and/or
31 project operations are road maintenance, water, and fire and police protection. None of these are typically
32 large for wind energy projects.

33 Tax impacts vary by project year, so this analysis presents values in present values, in addition to first
34 year values. Present value is the value in current, 2011 dollars of the future stream of tax payments. As
35 noted at the end of the previous section, to calculate the present value of the payments it is necessary to
36 discount future values because a payment this year is more valuable than an equivalent payment next year
37 (due to the use of the money this year). The discount rate used in this analysis is 3.0% (which means that
38 \$100 this year is equivalent to \$97 next year).

39 The State of Nevada uses *ad valorem* taxes to generate revenue for local services. The roads and buildings
40 in a wind energy project are taxed as real property, while the foundations, towers, WTGs, and other
41 components are taxed as personal property, using a several depreciation rates of varying years of useful
42 life. The assessed value is 35% of total project cost, less sales tax payments. Renewable energy projects

⁷ Ayee et al. point out that the market share of domestically produced wind turbine components was approximately 50% in 2008. They cite a different study that estimates each 100MW of installed wind power capacity generates 310 person-years of manufacturing sector jobs, 67 contracting and installation jobs, and 9.5 O&M jobs.

1 qualify for an abatement of 45% of their property tax bill, provided they meet certain conditions regarding
 2 capital cost, job creation, and wage and benefit rates. Of the remaining tax, 45% is distributed to the
 3 Nevada Renewable Energy Fund and the rest is apportioned to the local taxing districts in proportion to
 4 their levies. Table 4.12-6 displays the distribution of the first full year tax bill and the present value of
 5 property taxes over the 25 year life of the Proposed Action. The property tax bill declines each year as the
 6 project assets are depreciated. The biggest beneficiary of these taxes is the State of Nevada, followed by
 7 Clark County schools, Clark County general fund, and the Las Vegas Metropolitan Police Department.

8 **Table 4.12-6. Property Tax Revenues to Clark County with the 96 WTG Layout Alternative**

Taxing District	FY11-12 Tax Rate	Share of Property Tax of \$1,278,979	Present Value to 2011 at 3%
Clark County Capital	0.0500	\$20,515	\$171,875
Clark County Debt	0.0129	\$5,293	\$44,344
Clark County Family Court	0.0192	\$7,878	\$66,000
Clark County General Operating	0.4470	\$166,993	\$1,399,061
Clark County School Debt (Bonds)	0.5534	\$227,061	\$1,902,311
Clark County School O&M	0.7500	\$307,727	\$2,578,123
Indigent Accident Fund	0.0150	\$6,155	\$51,562
Las Vegas/Clark County Library District	0.0942	\$33,193	\$278,094
LVMPD Manpower Supplement - County	0.2800	\$114,885	\$962,499
Medical Assistance to Indigent Persons	0.1000	\$41,030	\$343,750
Town of Searchlight	0.0200	\$24,618	\$206,250
State Cooperative Extension	0.0100	\$4,103	\$34,375
State of Nevada	0.1700	\$69,751	\$584,375
	2.5217	\$764,015	\$6,379,533
Nevada Renewable Energy Fund (45%)		\$625,103	\$5,219,618
First Year Property Tax Bill with Abatement		\$1,389,118	\$11,599,150

9 **4.12.2.3 87 WTG Layout Alternative**

10 **Social Impacts**

11 The 87 WTG Layout Alternative would have similar effects on social well-being of area stakeholders,
 12 population, demographics, and housing as those identified under the Proposed Action.

13 **Economic Impacts**

14 ***Expenditures, Earnings, and Employment***

15 Construction. Under the 87 WTG Layout Alternative, the number of WTGs would be decreased to 87.
 16 The decreased number of WTGs would require a proportionate decrease in the number of road miles and
 17 electrical connections. The total construction expenditures of this alternative are estimated at nearly \$300
 18 million, excluding debt financing and sales tax (Table 4.12-7). The proportion of construction costs spent
 19 locally would increase slightly from 7.4% with the 96 WTG alternative to 7.5% with the 87 WTG
 20 alternative. Table 4.12-7 presents a summary of the 87 WTG Layout Alternative construction
 21 expenditures.

1 **Table 4.12-7. Summary of Project Construction Expenditures for the 87 WTG Layout**
 2 **Alternative**

Construction Input	Total Cost	Local Expenditures	Local %
Nonlabor			
WTGs, including transportation	\$195,820,000	\$0	0.0%
Roads and foundations	\$17,680,000	\$8,840,000	50.0%
Cables and electrical connections	\$14,150,000	\$520,000	3.7%
Interconnection switching station	\$7,730,000	\$390,000	0.0%
Balance of plant (buildings, construction, engineering, administration, etc.)	\$25,440,000	\$960,000	3.8%
Nonlocal labor living expenses		\$3,090,000	
Nonlabor Subtotal	\$260,820,000	\$13,800,000	5.3%
Labor			
WTGs	\$7,100,000	\$1,920,000	27.0%
Roads and foundations	\$3,620,000	\$1,150,000	31.8%
Cables and electrical connections	\$11,580,000	\$2,910,000	25.1%
Interconnection switching station	\$2,810,000	\$480,000	17.1%
Balance of plant (buildings, construction, engineering, administration, etc.)	\$10,870,000	\$2,010,000	18.5%
Labor Subtotal	\$35,970,000	\$8,470,000	23.5%
Total Construction Costs	296,790,000	22,270,000	7.5

3 The total economic impacts of project construction are the sum of direct, indirect, and induced effects (see
 4 Table 4.12-8). These impacts are slightly less than the impacts of the 96 WTG Layout Alternative.

5 **Table 4.12-8. Construction Impacts for the 87 WTG Layout Alternative**

Economic Impact	Direct Impact	Indirect Impact	Induced Impact	Total Impact
Output (millions 2011\$)	\$22.3	\$6.6	\$8.4	\$37.2
Labor Income (millions 2011\$)	\$8.5	\$2.3	\$2.4	\$13.2
Employment (full and part-time temporary jobs)	275	44.7	63.2	382.9

Note: Totals may not add up due to rounding.

6 O&M and Decommissioning. Upon completion of construction, ongoing O&M activities would create
 7 long-term economic benefit to Clark and Mohave counties. Annual operations are estimated to require
 8 \$7.4 million (excluding taxes and debt service costs), of which \$2.7 million would be expended locally
 9 (Table 4.12-9). Annual O&M costs mirror those with the 96 WTG Layout Alternative, but would be
 10 slightly less due to the smaller number of WTGs.

1 **Table 4.12-9. Summary of Project Annual Operations Expenditures for 87 WTG Layout**
 2 **Alternative**

Cost Category	Total Cost	Materials Expenditures	Labor Expenditures	Total Local Expenditures	Local %
WTG warranty and O&M expenses	\$3,340,000	\$130,000	\$530,000	\$670,000	20.1%
Balance of plant O&M expenses	\$1,900,000	\$80,000	\$1,390,000	\$1,460,000	76.8%
Other O&M expenses	\$600,000	\$210,000	\$340,000	\$550,000	91.7%
BLM land lease payment	\$830,000	\$0	\$0	\$0	0.0%
Insurance	\$770,000	\$0	\$0	\$0	0.0%
Non-local labor living expenses		\$50,000		\$50,000	100.0%
Annual Total	\$7,440,000	\$470,000	\$2,260,000	\$2,680,000	36.0%

Notes:

1. Property tax of \$1,279,000 in first year not included.
2. Totals may not add due to rounding.
3. Adjusted to 2011 dollars using forecasts of Gross Domestic Product (GDP) Implicit Price Deflator from IHS Global Insight's April 2011 baseline forecast
4. Nonlocal labor living expenses estimated to be 15% of wages.

3 The direct expenditures described above were run through the two-county IMPLAN model to generate the
 4 estimated impacts in Table 4.12-10. The addition of indirect and induced impacts to the \$2.7 million in
 5 local expenditures creates a total annual impact of \$4.5 million in economic output for the two-county
 6 region. Labor income is increased by \$2.85 million annually. An estimated 15 full- and part-time jobs
 7 would be created directly by project operations. Note that these are not all direct hires by the project
 8 operator, but may be employed by vendors serving the Proposed Project. Indirect impacts would add
 9 another 1.1 jobs and induced impacts another 12.3, for a total impact of 28.4 permanent full- and part-
 10 time jobs.

11 **Table 4.12-10. Summary of Annual Operations Impacts for the 87 WTG Layout Alternative**

Economic Impact	Direct Impact	Indirect Impact	Induced Impact	Total Impact
Output (millions 2011 \$)	\$2.68	\$0.17	\$1.63	\$4.49
Labor income (millions 2011 \$)	\$2.26	\$0.06	\$0.53	\$2.85
Employment (full- and part time jobs)	15.0	1.1	12.3	28.4

Notes:

1. Totals may not add up due to rounding.
2. Does not include impacts of local expenditure of property tax revenue.

12 **Economic Impacts Summary**

13 Total regional economic impacts of each phase of construction and operations for the 87 WTG Layout
 14 Alternative are presented in Table 4.12-11. The impacts are similar to those of the 97 WTG Layout
 15 Alternative, but slightly lower in proportion to the decrease in WTGs.

1 **Table 4.12-11. Summary of Estimated Impacts of 87 WTG Layout Alternative**

Economic Impact	Construction (one-time)	Operations (Annual)	Present Value Project Total
Output (millions 2011 \$)			
Direct effects	\$22.3	\$2.7	\$67.6
Indirect effects	\$6.6	\$0.2	\$9.5
Induced effects	\$8.4	\$1.6	\$36.0
Total Output Effects	\$37.2	\$4.5	\$113.1
Labor Income (millions 2011 \$)			
Direct effects	\$8.5	\$2.3	\$46.7
Indirect effects	\$2.3	\$0.1	\$3.4
Induced effects	\$2.4	\$0.5	\$11.3
Total Income Effects	\$13.2	\$2.8	\$61.4
Employment (Jobs)			
Direct effects	275.0	15.0	
Indirect effects	44.7	1.1	
Induced effects	63.2	12.3	
Total Employment Effects	382.9	28.4	

Note:

1. Totals may not add due to rounding.
2. Employment includes both full and part-time jobs.

2 **Fiscal Impacts**

3 Under the 87 WTG Layout Alternative, fiscal impacts would be the same as under the 96 WTG Layout
 4 Alternative, with small decreases in proportion because of the smaller number of WTGs. Table 4.12-12
 5 displays the distribution of the first full year tax bill of 1.28 million and the present value of property
 6 taxes over the 25-year life of the project, \$10.68 million.

1 **Table 4.12-12. Property Tax Revenues to Clark County with the 87 WTG Layout**
 2 **Alternative**

Taxing District	FY11-12 Tax Rate	Share of Property Tax of \$1,278,979	Present Value to 2011 at 3%
Clark County Capital	0.0500	\$19,155	\$160,484
Clark County Debt	0.0129	\$4,942	\$41,405
Clark County Family Court	0.0192	\$7,356	\$61,626
Clark County General Operating	0.4470	\$155,925	\$1,306,338
Clark County School Debt (bonds)	0.5534	\$212,013	\$1,776,235
Clark County School O&M	0.7500	\$287,332	\$2,407,257
Indigent Accident Fund	0.0150	\$5,747	\$48,145
Las Vegas/Clark County Library District	0.0942	\$30,994	\$259,663
LVMPD Manpower Supplement County	0.2800	\$107,271	\$898,709
Medical Assistance to Indigent Persons	0.1000	\$38,311	\$320,968
Town of Searchlight	0.0200	\$22,987	\$192,581
State Cooperative Extension	0.0100	\$3,831	\$32,097
State of Nevada	0.1700	\$65,129	\$545,645
	2.5217	\$703,439	\$5,873,720
Nevada Renewable Energy Fund (45%)		\$575,541	\$4,805,771
First Year Property Tax Bill with abatement		\$1,278,979	\$10,679,492

Notes

1. Assumes assessed value to be 35% of \$292.75 million total project cost (less sales tax) for 87 WTGs, with a 45% property tax abatement for renewable energy projects.
2. Rates for Clark County Tax Districts 700 and 701 for FY2011-12, with 45% to Nevada Renewable Energy Fund & remainder through normal proration to taxing districts.
3. Present values of future tax payments calculated using a 3% social discount rate.
FY = fiscal year; LVMPD = Las Vegas Metropolitan Police Department; O&M = operations and maintenance

3 **Sales Tax**

4 Under the 87 WTG Layout Alternative, sales tax would be the same as under the 96 WTG alternative, but
 5 slightly lower. Under this alternative, sales taxes of \$6.35 million would be paid to the State of Nevada
 6 for project construction.

7 **4.12.3 Mitigation**

8 No adverse impacts to socioeconomic conditions are anticipated; therefore, no mitigation is proposed.

9 **4.12.4 Residual Impacts**

10 During the construction phase of the Proposed Action, there would be short-term, beneficial residual
 11 effects on population and housing, the regional economy, and personal income and employment levels,
 12 public services, and tax revenues. During O&M phases, there would be long-term beneficial residual
 13 effects on population and housing, the regional economy, and personal income and employment levels,
 14 public services, and tax revenues. Effects on social and economic conditions from decommissioning are
 15 also expected to be beneficial.

4.13 Environmental Justice Impacts

This section discusses effects on environmental justice that may occur with implementation of the Proposed Action or alternatives. Data used for the environmental justice analysis was obtained from the 2000 Decennial Census and is presented in detail in Section 3.13, Environmental Justice. As discussed in Section 3.13, the Proposed Project area is not considered an environmental justice community, with respect to minority populations (including American Indian communities) or income. As such, any project-related impacts that would occur within the boundaries of the project area would not have any disproportionately adverse human health or environmental effect on minority, American Indians, or low-income populations.

4.13.1 Indicators

Consistent with Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (February 11, 1994), this environmental justice analysis identifies and addresses any disproportionately high and adverse human health or environmental effects of its actions on minority and low-income populations. The CEQ (1997) has issued guidance to federal agencies on the definition of disproportionately high and adverse effects as used in EO 12898, as follows:

- **Disproportionately High and Adverse Human Health Effects.** When determining whether human health effects are disproportionately high and adverse, agencies are to consider the following three factors to the extent practicable:
 1. Whether the health effects, which may be measured in risks and rates, are significant (as employed by NEPA), or above generally accepted norms;
 2. Whether the risk or rate of hazard exposure to a minority population, low-income population, or Indian tribe to an environmental hazard is significant (as employed by NEPA) and appreciably exceeds or is likely to appreciably exceed the risk or rate to the general population or other appropriate comparison group; and
 3. Whether health effects occur in a minority population, low-income population, or Indian tribe affected by cumulative or multiple adverse exposure to environmental hazards.
- **Disproportionately High and Adverse Environmental Effects.** When determining whether environmental effects are disproportionately high and adverse, agencies are to consider the following three factors to the extent practicable:
 1. Whether there is or will be an impact on the natural or physical environment that significantly (as employed by NEPA) and adversely affects a minority population, low-income population, or Indian tribe. Such effects may include ecological, cultural, human health, economic, or social impacts on minority communities, low-income communities, or Indian tribes when those impacts are interrelated to impacts on the natural or physical environment;
 2. Whether environmental effects are significant (as employed by NEPA) and are or may be having an adverse impact on minority populations, low-income populations, or Indian tribes that appreciably exceed or are likely to appreciably exceed those on the general population or other appropriate comparison group; and
 3. Whether the environmental effects occur or would occur in a minority population, low-income population, or Indian tribe affected by cumulative or multiple adverse exposures from environmental hazards.

In addition, the BLM Land Use Planning Handbook defines BLM's environmental justice principles and considers "aggregate, cumulative, and synergistic effects, including results of actions taken by other parties" (BLM 2005a).

4.13.2 Direct and Indirect Effects by Alternative

This section discusses the potential direct and indirect effects on environmental justice under each alternative. Analysis for this section was completed by assessing potential temporary (i.e., construction) and permanent impacts resulting from the implementation of each alternative and comparing these impacts to the Census Tracts, Block Groups, and blocks within and in the vicinity of the Proposed Project area.

4.13.2.1 No Action Alternative

Under the No Action Alternative, the ROW application would be denied and the Proposed Project would not be built. There would be no change in current conditions for minority and low-income populations under this alternative. The opportunities for any minority and low-income persons to seek employment at higher wages would not occur.

4.13.2.2 Proposed Action - 96 WTG Layout Alternative

Under the 96 WTG Layout Alternative, the BLM would grant the Applicant ROW to construct, operate and maintain, and decommission a wind energy generation facility. Additionally under the Proposed Action, the BLM would authorize Western to construct, operate, and maintain the proposed switching station. Section 3.13, Environmental Justice, presents a review of the estimated 2008 populations of the two-county (Clark and Mohave) SIR and the SIA. The SIR was observed to have similar but somewhat lower proportions of minority populations than the States of Nevada and Arizona overall. The SIA is markedly less diverse. Hispanic and American Indian populations have been growing in number slightly faster than the overall population in the SIA. African Americans and Asians are few in number, but their populations are growing the most rapidly within the SIA. The conclusion is that minority populations are under-represented within the SIA.

In terms of low-income populations, estimated 2008 poverty levels for families in the SIR at 7.7% are comparable to poverty levels for the State of Nevada at 7.3% and lower than the State of Arizona at 9.8% (see Table 3.13-1 in Section 3.13, Environmental Justice). The SIA has fewer families living in poverty (6.7%). The conclusion is that Proposed Project area is not close to large numbers of low-income residents.

Under the 96 WYG Layout Alternatives, both construction and O&M activities would offer opportunities for minority and low-income persons to seek employment at higher wages. These opportunities are a tangible, if not measurable, positive impact.

Neither the temporary noise impacts during Proposed Action construction nor the viewshed effects during O&M would particularly affect low-income or minority neighborhoods. In fact, Cottonwood Cove Road passes by some of the newer homes in the Searchlight area. As described Section 4.12, Socioeconomics Impacts, no negative economic impacts on property values from construction and O&M of the 87 WTG Layout Alternative could be documented.

Because the nonwhite racial minority population in the SIA is less diverse than that of the SIR, Nevada and Arizona, and the U.S. overall, there are no minority populations that meet the environmental justice criteria. Given that poverty levels for the SIA are lower than the SIR, Nevada and Arizona, and the United States, there are no low income populations that meet the environmental justice criteria. Mitigation would not be warranted because the only effects identified were the beneficial effects of additional employment opportunities.

4.13.2.3 87 WTG Layout Alternative

Because the Proposed Project area under the 87 WTG Layout Alternative would be located within the same Census Tracts, Block Groups, and blocks as the 96 WTG Layout Alternative, the environmental

1 justice impacts on each of these demographics would be identical under the 87 WTG Layout Alternative.
2 The 87 WTG Layout Alternative would not disproportionately affect minority and/or low-income
3 populations who meet the environmental justice criteria.

4 **4.13.3 Mitigation**

5 No adverse effects to environmental justice populations are anticipated; therefore no mitigation is
6 proposed.

7 **4.13.4 Residual Effects**

8 The Proposed Action and alternative would have no environmental justice impacts because there are no
9 environmental justice communities within the Proposed Project area; therefore, the Proposed Project
10 would have no residual effects under this criterion.

4.14 Health and Human Safety Impacts

This section discusses effects on human health and safety due to exposure to or creation of hazards that might occur with implementation of the Proposed Action, alternatives or Western’s proposed switching station. Potential effects are discussed, agency-recommended mitigation measures are presented, and a discussion of residual effects is provided. It is the BLM’s policy to reduce threats to public health, safety, and property. In addition, in accordance with the FLPMA, the BLM is required to comply with state standards for public health and safety. Written and verbal comments gathered during the EIS scoping period focused on concerns related to wildfire management, emergency response time, water resources impacts (e.g., chemical spills), and air traffic safety and future air travel facilities development.

4.14.1 Indicators

Under NEPA, significant effects on health and safety would occur if the Proposed Project:

- Uses, stores, or disposes of petroleum products and/or hazardous materials in a manner that results in a release to the aquatic or terrestrial environment in an amount equal to or greater than the reportable quantity for that material or creates a substantial risk to human health;
- Mobilizes contaminants currently existing in the soil or groundwater, creating potential pathways of exposure to humans or wildlife that would result in exposure to contaminants at levels that would be expected to be harmful;
- Exposes workers to contaminated or hazardous materials at levels in excess of those permitted by the Federal Occupational Safety and Health Administration (OSHA) in 29 CFR §1910, or expose members of the public to direct or indirect contact with hazardous materials from the Proposed Action’s construction or operations; or
- Exposes people residing or working in the Proposed Action vicinity or structures to safety hazards and/or a significant risk of loss, injury, or death.

In order to compare effects associated with the Proposed Action and alternative project elements, the indicators were considered both independently and in conjunction with one another using the following assumptions.

This analysis evaluates several aspects of the proposed use of hazardous materials at the proposed wind energy facility in order to assess the potential for released hazardous materials to affect the public. It is recognized that some hazardous substances must be used at the facility. Therefore, this analysis was conducted by examining the choice and amount of chemicals to be used, the manner in which the Applicant and Western would use the chemicals, the manner by which they would be transported to the facility, the way in which the Applicant and Western plan to store the materials on site, and engineering and administrative controls that the Applicant and Western will implement to mitigate the potential for hazardous substance releases, fire hazards, and exposure of the public and workers to hazards associated with the Proposed Project. In addition, the area within a 1-mile distance from the Proposed Project site boundary was researched and analyzed for potential hazardous materials facilities that could affect the Proposed Project, such as residential and commercial properties.

4.14.2 Direct and Indirect Effects by Alternative

This section describes the effects under each alternative using the respective methodology prescribed under NEPA. To compare effects, this analysis defines the temporal scale (time), spatial extent (area), and intensity of effects for each alternative. The analysis of direct and indirect effects focuses on the potential effects on public safety due to the exposure to hazards and hazardous materials on the general public, workers, and the environment.

1 The primary mechanisms for potential exposure to human health and safety hazards considered for this
2 analysis include improper handling or transport of hazardous materials, reasonably foreseeable but
3 inadvertent spills or releases of hazardous materials, soil disturbance on sites with known and unknown
4 contamination, and electrical and fire hazard. Impacts would be considered significant if there were a
5 violation of federal, state, or local regulations regarding proper hazardous material storage, use, and/or
6 disposal.

7 **4.14.2.1 No Action Alternative**

8 Under the No Action Alternative, the ROW applications would be denied and the Proposed Project and
9 Western's proposed switching station would not be built; therefore, no project related effects on health
10 and human safety would occur.

11 **4.14.2.2 Proposed Action – 96 WTG Layout Alternative**

12 Under the 87 WTG Layout Alternative, the BLM would approve the ROW applications and the Proposed
13 Action would be carried forward. Effects that could result from the implementation of Proposed Action
14 during construction, O&M, or decommissioning activities are analyzed in this section. The Applicant has
15 incorporated the following measures to avoid and minimize impacts on human health and safety within
16 the Proposed Project area:

- 17 • APM-1 Erosion Control
- 18 • APM-2 Excavation/Grading
- 19 • APM-3 Air/Dust Control
- 20 • APM-4 SWPP
- 21 • APM-5 SPCCP
- 22 • APM-6 Health and Safety Program
- 23 • APM-7 Emergency Response Plan
- 24 • APM-8 Waste Management Plan
- 25 • APM-9 Weed Control Plan
- 26 • APM-10 Site Rehabilitation Plan and Facility Decommissioning Plan
- 27 • APM-11 Aeronautical Considerations
- 28 • APM-13 Environmental Clearance
- 29 • APM-14 General Design and Construction Standards

30 Additionally under the Proposed Action, the BLM would authorize Western to construct, operate, and
31 maintain the proposed switching station. For construction of the Western Switching Station, Western will
32 require the construction contractor to incorporate specific provisions to mitigate impacts related to human
33 health and safety in Western's Environmental Construction Standard 13, specifically the following
34 sections:

- 35 • 13.1 Contractor Furnished Data
- 36 • 13.3 Landscape Preservation
- 37 • 13.5 Noxious Weed Control
- 38 • 13.7 Use of Recovered Material and Biobased Products
- 39 • 13.8 Disposal of Waste Material
- 40 • 13.9 Contractor's Liability for Regulated Material Incidents
- 41 • 13.10 Pollutant Spill Prevention, Notification, and Cleanup
- 42 • 13.12 Treated Wood Poles and Members Recycling or Disposal
- 43 • 13.13 Prevention of Air Pollution
- 44 • 13.14 Handling and Management of Asbestos Containing Material
- 45 • 13.16 Prevention of Water Pollution

- 1 • 13.17 Testing, Draining, Removal, and Disposal of Oil-Filled Electrical Equipment
- 2 • 13.18 Removal of Contaminated Material

3 Construction and O&M activities of the Proposed Action would take place on previously undeveloped
4 BLM lands. Potential safety risks associated with the Proposed Action phases range from accidental spills
5 or releases of hazardous substances; mobilization of existing contamination; handling and disposal of
6 hazardous materials; and potential exposure to electrical, flood, fire, and aircraft operation hazards.

7 **Hazardous Materials**

8 Construction. Construction of Proposed Action including Western's proposed switching station would
9 have potential human health and safety effects from the use, transport, and disposal of petroleum products
10 and hazardous materials. During construction activities, localized spills and leaks of hazardous materials
11 from equipment, storage sites, and/or vehicles could occur as a result of improper handling or inadvertent
12 spills, which could result in exposure of the public or wildlife to contaminants. Potential sources of spills
13 and leaks would be the operation of heavy equipment and filling of transformer and hydraulic equipment
14 reservoirs. Hazardous materials that would be used and discarded during the construction activities
15 include gasoline, diesel fuel, motor oil and oil filters, hydraulic fluids and lubricants, paints, solvents,
16 cleaning fluids, adhesives, batteries, empty hazardous material containers (<1 ton), and spent welding
17 materials.

18 Hazardous construction materials would be delivered to the site by truck and temporarily stored in
19 designated staging areas. Additionally, some hazardous materials such as vehicle fuel, oils, and other
20 fluids for vehicle maintenance would be used and stored in construction vehicles. Construction equipment
21 would be well-maintained at all times to minimize leaks of motor oils, hydraulic fluids, and fuels. All
22 vehicle maintenance would be performed off site at an appropriate facility. An environmentally benign
23 detergent would be used to remove wind-carried particulate matter from internal and external WTG
24 mechanisms. Hydrocarbon or hazardous wastes may be generated from maintenance of heavy equipment
25 in the field. These wastes would include used oil and grease, antifreeze, solvents, rags, and wipes. These
26 wastes would be properly contained, labeled, and recycled or disposed of offsite in existing permitted
27 facilities.

28 Construction activities could temporarily expose workers to direct or indirect contact with hazardous
29 materials at levels in excess of those permitted by the OSHA (29 CFR, Part 1910). Workers who work
30 with hazardous materials are required under OSHA regulations to have a certain level of training to
31 properly handle hazardous materials. However, due to improper handling of hazardous materials, workers
32 could be exposed in excess of permitted levels. To address workers potential exposure to contaminated or
33 hazardous materials, the Applicant would develop and implement a Health and Safety Program (APM-6)
34 that would require all employees and contractors to adhere to appropriate health and safety plans and
35 emergency response plans that meet industry standards. However, detailed content of this plan is not
36 currently available.

37 Solid waste streams generated during construction of the Proposed Action would include MSW, sewage,
38 construction debris, nonhazardous regulated wastes, and small quantities of hazardous wastes. MSW from
39 the workforce would be collected, contained, and trucked to an offsite permitted landfill or equivalent.
40 Sewage would be collected in portable sanitary facilities and removed by a contractor for offsite treatment
41 and disposal in an existing permitted treatment facility. Sanitary waste would be removed by a sanitary
42 service contractor. Solid waste generated during construction would be recycled or disposed of at either
43 an industrial or municipal landfill.

44 In the event of any accidental spill, the Applicant would clean up and restore the spill site (see APM-5
45 and APM-7), and the resultant waste would be properly disposed in accordance with federal and state
46 regulations. In addition, the Applicant would require all contractors and employees to comply with a
47 Health and Safety Program (APM-6) during construction.

1 Because of the size of the Proposed Project, in addition to APM-7, the Applicant is required to prepare
2 and implement a SPCC plan (APM-5) that would include BMPs for hazardous materials management.
3 Additionally, a SWPPP (APM-4) will be prepared by the Applicant to prevent pollution from storm water
4 runoff. To date, detailed information about the SPCC plan and SWPPP has not been available; the
5 Applicant has committed to developing a SPCC plan and SWPPP prior to construction to protect the
6 environment from spills of petroleum products.

7 With the proper implementation of the APMs, and adherence to regulations, any release that occurred
8 would likely be below the reportable quantity for hazardous materials and would be cleaned up in a
9 manner that complies with federal, state, and local regulations, thereby limiting or preventing any
10 potential exposure to people or wildlife. Such measures would also reduce potential for wildfire.
11 Therefore, the potential impact of an accidental release of hazardous materials during construction would
12 be short term and localized.

13 Another potential effect to human health and safety during construction would be the disturbance of
14 unearthing of hazardous waste-contaminated soils. Currently, there is no evidence to suggest that onsite
15 soils are contaminated; however, soils in the project area have not been sampled and characterized, and
16 mining activity has been reported within the project area and vicinity. Therefore, the possibility exists that
17 small amounts of contaminated soils might be present on site. Construction activities could unearth this
18 contamination, and construction workers or wildlife could be exposed.

19 Construction of the proposed switching station may have similar hazards as those discussed above.
20 Implementation of relevant sections of Western's Construction Standard 13 would minimize these
21 potential effects.

22 O&M. The O&M of the Proposed Project would involve the periodic and routine transport, use, and
23 disposal of hazardous materials and equipment containing hazardous materials such as paint, lubricating
24 oils, welding gases, hydraulic fluid, and cleaning solvents for WTG and substation maintenance. The
25 hazardous substances to be used during O&M would have low and moderate (acetylene only) toxicity
26 materials under the National Fire Protection Agency health rating. The Applicant and Western would
27 have to comply with the standards of the required hazardous material permits to be issued by the Nevada
28 State Fire Marshal and the Clark County Fire Department for the proper storage of these hazardous
29 materials on site. In their permit application, the Applicant would be required to include a Hazardous
30 Material Management Plan that includes a Facility Site Plan designating storage and use areas, maximum
31 amount of materials to be stored, container sizes and types, location of emergency isolation and
32 mitigation valves, and the proposed storage arrangement.

33 The WTGs would typically use lubricating oils and greases, none of which contain any compounds listed
34 as hazardous by the EPA. These are used in moderate quantities and are contained entirely within the spill
35 trap and nacelle, so the possibility for accidental leakage is minimal. Lubricating oils are checked
36 quarterly and filled and changed as needed. Spent oils would be recycled with a certified waste contractor.
37 Oil changes would be performed up-tower, where any accidental spills would be contained by the nacelle.

38 Solid waste streams generated during O&M of the Proposed Action would include MSW, sewage,
39 nonhazardous regulated wastes, and small quantities of hazardous wastes. MSW from the O&M
40 workforce would be collected, contained, and trucked to an offsite permitted landfill or equivalent.
41 Sewage and waste water from toilet flushing at the O&M building would be treated with an onsite septic
42 tank and absorption field. The septic tank and absorption field would be located adjacent to the O&M
43 building. The Applicant would apply for a Small Commercial Septic System Permit from the Clark
44 County Health District (see Section 4.3.2, MM Water-1).

45 Transformers would contain cooling oil that is designated nonpolychlorinated biphenyl. Inspection of
46 each transformer to detect and prevent leaks would be performed on a regular basis.

1 O&M of the transmission line and substation facilities would use little in the way of hazardous materials
2 and would generate only minor amounts of MSW, which would be brought back to the O&M building for
3 disposal. Transformer oils would be used in some of the transformers and certain other electrical devices.
4 These are highly refined petroleum oils with low vapor pressure, high flash point, and low toxicity. In
5 normal use, the oils are fully contained within the electrical apparatus, which themselves would be
6 located within secure, fenced facilities. These management practices would therefore produce negligible
7 environmental impacts.

8 Small quantities of oils and greases would be stored in the O&M building on site in properly suited
9 containers. All special wastes, including waste oils and contaminated rags, would be removed from the
10 site using a controlled waste manifest. All waste materials would be disposed of via a licensed waste
11 carrier, who would deliver the material to a licensed waste disposal site. In addition, O&M vehicles and
12 equipment would be well-maintained at all times to minimize leaks of motor oils, hydraulic fluids, and
13 fuels. All vehicle maintenance would be performed off site at an appropriate facility.

14 The presence of potentially hazardous materials as well as high-voltage electrical equipment poses
15 potential safety risks to local responders. Project components create the potential for a fire or medical
16 emergency due to the storage and use of diesel fuels, lubricating oils, and hydraulic fluids. Storage and
17 use of these substances may occur at the substations, in electrical transmission line structures, at staging
18 area(s), and in the O&M building. However, due to the accessibility of these areas, response to an
19 emergency should not be difficult for local fire and emergency personnel.

20 With the proper implementation of the APMs, MMs, and adherence to regulations, any release that
21 occurred would likely be below the reportable quantity for hazardous materials and would be cleaned up
22 in a manner that complies with federal, state, and local regulations, thereby limiting or preventing any
23 potential exposure to any people or wildlife. Such measures would also reduce potential for wildfire.
24 Therefore, the potential impact of an accidental release of hazardous materials during O&M would be
25 short term and localized. Additional mitigation measures are not required for O&M activities.

26 Decommissioning. Decommissioning of the Proposed Action components would occur upon cessation of
27 the ROW grant and/or the end of operation and removal of equipment (e.g., WTGs, substations, O&M
28 building). The Proposed Action facilities have an expected life of approximately 30 years. The Applicant
29 would develop a Site Rehabilitation Plan and Facility Decommissioning Plan for site closure activities
30 (APM-10).

31 During decommissioning, the potential effects on human and ecological receptors would be similar to
32 those described in the construction section. Additionally, decommissioning activities that would disturb
33 soil include the removal of WTGs, support towers, and supporting foundations; demolition and removal
34 of the O&M building, substations, and switchyards; removal of transmission poles and conductors; and
35 closure and abandonment of the septic tank. If a spill of hazardous materials occurs, residual
36 contamination could be unearthed.

37 In the Facility Decommission Plan, the Applicant would address the removal of equipment and hazardous
38 material, impacts and mitigation associated with the decommissioning and closure of the site, the
39 schedule of closure activities, a listing of equipment or disturbances to remain at the site, and the
40 conformance of the plan with applicable federal, state, and local regulations.

41 Solid waste streams generated during decommissioning of the Proposed Action, including substations,
42 would include MSW, sewage, non-salvageable equipment, nonhazardous regulated wastes, and small
43 quantities of hazardous wastes. MSW from the workforce would be collected, contained, and trucked to
44 an offsite permitted landfill or equivalent. The septic system would be abandoned in a manner consistent
45 with state and local health regulations.

46 With the proper implementation of the APMs, MMs, and adherence to regulations, any release that
47 occurred would likely be below the reportable quantity for hazardous materials and would be cleaned up

1 in a manner that complies with federal, state, and local regulations, thereby limiting or preventing any
2 potential exposure to any people or wildlife. Such measures would also reduce potential for wildfire.
3 Therefore, the potential impact of an accidental release of hazardous materials during decommissioning
4 would be short term and localized. Additional mitigation measures are not required for decommissioning
5 activities.

6 **Fire and Electrocution Hazards**

7 Construction. During construction, the Proposed Project activities and related equipment could expose
8 people or structures to an increased risk of loss, injury, or death as a result of electrocution or exposure to
9 wildland fires, including wildlands adjacent to urbanized areas in the town of Searchlight (residential and
10 commercial areas) and occasional recreational visitors within the project vicinity.

11 The risk of fire danger would be related to the combustion of native materials due to smoking, refueling,
12 and operating vehicles and other equipment off roadways. Brushing activities for vegetation control and
13 removal during construction could present a fire hazard if the vegetation debris were not removed from
14 areas used for welding.

15 The Community Hazard Assessment conducted for the Clark County Multi-Jurisdictional Hazard
16 Mitigation Plan (2005) classifies Searchlight as a “Moderate Hazard” due to its moderate wildfire risk
17 potential, primarily due to steep topography and limited fire suppression resources. The Proposed Project
18 would pose two major potential ignition sources during construction: brushing and welding. Organic
19 matter removed during vegetation clearing and grubbing would be mulched on site and redistributed into
20 the fill (except under equipment foundations, trenches, and roadways), thereby increasing the risk of
21 wildland fires within the construction areas. In addition, WTG, collector, and transmission line
22 construction would involve welding operations, which would increase the risk of wildland fire ignition
23 within the construction areas.

24 Existing facilities located in proximity of the Proposed Project site are primarily dispersed residential
25 properties, an elementary school, and commercial businesses within Searchlight. The Clark County Multi-
26 Jurisdictional Hazard Mitigation Plan (Clark County 2005) has included a recommended measure for
27 reducing the fire risk in Searchlight by removing abandoned structures and establishing defensible spaces
28 around residential and commercial properties.

29 If the introduction of invasive, non-native plants is not controlled during construction, over time the
30 project site could become dominated with non-native plants that tend to increase the frequency and
31 severity of wildfires that might occur during the Proposed Project operational phase. The proposed Weed
32 Control Plan (APM-9) would minimize the potential for weed colonization and dominance on site by
33 requiring implementation of a risk assessment of the invasive weed species currently known within the
34 project area, procedures to control their spread on site, and procedures to help minimize the introduction
35 of new weed species. Implementation of this mitigation measure would not completely eliminate the
36 introduction of noxious or invasive weeds into the study area, but it would minimize their introduction
37 and control their spread on the project site.

38 Portions of the Project Action are located close to overhead transmission power lines. Construction of the
39 Proposed Project could also expose workers to potential electrocution hazards. However, the Applicant
40 has committed to designing the proposed electric systems and components in compliance with the
41 National Electric Code (NEC) and National Electric Safety Code, as well as additional industrial safety
42 standards and federal, state, and local codes (APM-14). Additionally, to ensure compliance with OSHA in
43 29 CFR, Part 1910, the Applicant would implement MM SAFE-3 during construction activities, including
44 but not limited to Subpart S and Sections 1910.331-1910.335 related to protective measures and
45 equipment for employees whose occupations require them to work directly with electricity.

46 Implementation of MM SAFE-4 along with the Applicant’s Emergency Response Plan (APM-7) and
47 Weed Control Plan (APM-9) would reduce the risk of wildland fires by providing prevention and

1 response measures to potential fire hazards. In addition, implementation of MM SAFE-3 would ensure
2 that construction employees and those working with electrical equipment would be required to follow
3 electrical safety-related work practices required by OSHA regulations.

4 O&M. The O&M of the Proposed Action could result in wildfire ignition if the WTG rotor blades were to
5 spin out of control and cause a fire in the nacelle. In addition, during operation, lightning strikes on
6 WTGs could create power surges that could result in a fire. WTGs can be the source of wildfire ignitions
7 due to collection line failure, WTG malfunction or mechanical failure, and lightning- and bird-related
8 incidents. When mechanical or electrical failures cause a WTG to catch fire, they might burn for many
9 hours due to the limited ability of fire suppression crews to effectively fight fires hundreds of feet above
10 the ground. High-wind conditions are risky for both WTG malfunction and the spread of wildfire. Wind-
11 blown flaming debris from a WTG fire can ignite vegetation in the surrounding area. In addition, pad-
12 mounted transformers can explode and result in a wildfire ignition, although this is expected to be a rare
13 occurrence. However, vegetation clearance requirements (APM 9) and project design features (APM-14)
14 would reduce the potential for wildfire ignition and the potential for a wildfire to spread out of control.

15 The height of the WTGs could interfere with aerial firefighting operations by obstructing low-level flight
16 paths within the site boundaries. The presence of the existing transmission lines in the project vicinity
17 causes aerial firefighters to avoid flying in the immediate project vicinity under existing conditions.
18 Obstruction of aerial firefighting from the presence of WTGs and transmission lines would be moderate.

19 Additional O&M activities that would increase the potential for additional incidents related to fire and fire
20 safety include the storage and use of hydraulic oil and other petroleum products, which combined with
21 electrical arcing and sparking from exposed wiring between WTGs, collectors, transmission line,
22 substations, and Western's proposed switching station, would result in a fire hazard.

23 To reduce fire risk, the Applicant would construct a 20-foot-wide firebreak on the exterior of the
24 perimeter fencing surrounding the O&M building and the proposed substations, in addition to a 20-foot
25 wide firebreak surrounding individual WTG locations (APM-7). Shrubs and other large vegetation would
26 be removed from the firebreak. The firebreak would be maintained by grading or discing.

27 The electrical equipment enclosures that would house the transformers would be either metal or concrete
28 structures. Any fire that could potentially occur would be contained within the structures, which would be
29 designed to meet National Electrical Manufacturers Association standards for electrical enclosures (APM-
30 14).

31 O&M activities could also expose workers to potential electrocution hazards from the electrically
32 energized equipment. However, the Applicant has committed to designing the proposed electric systems
33 and components in compliance with the NEC and other applicable federal and industrial standards (APM-
34 14).

35 Decommissioning. Decommissioning of the Proposed Project would involve similar fire and electrocution
36 risks as those described for the construction activities.

37 **Turbine Hazards**

38 O&M. Because of active, existing mineral claims within the project boundary, existing OHV trail use in
39 the project area, and estimated use of the project access roads by OHV users, there is the possibility that
40 the Proposed Project could create hazards or might adversely affect public safety due to potential blade
41 throw or turbine collapse. The Applicant has proposed an estimated blade throw safety set-back for each
42 turbine using a circle around each turbine with a radius of 886 feet (APM-14). This is a conservative
43 safety set-back using an estimated maximum blade height of 295 feet multiplied by a factor of 3 (based on
44 blade throw studies summarized in Larwood [2005]).

1 Trench Hazards

2 Construction. Because the Applicant will be excavating trenches to lay down communication and
3 electrical lines between WTGs and collection points, there is the possibility that the Proposed Project
4 could create open trench hazards during the construction phase that might adversely affect worker and/or
5 public safety. The Applicant and Western will adhere to OSHA standards for trenching and excavation
6 safety as outlined in 29 CFR 1926. To address workers potential exposure to contaminated or hazardous
7 materials, the Applicant would develop and implement a Health and Safety Program (APM-6) that would
8 require all employees and contractors to adhere to appropriate health and safety plans and emergency
9 response plans that meet industry standards. However, detailed content of this plan is not currently
10 available. The Applicant and Western will additionally ensure that all open trenches are property
11 demarcated to ensure that both workers and the public are aware of the location of any open trenches
12 when traveling in the project area.

13 4.14.3 Mitigation

14 To further reduce effects to Human Health and Safety, the following mitigation measures would be
15 implemented:

16 MM SAFE-1: Hazardous Materials Management. The Applicant will implement a Hazardous
17 Materials Handling Management Program or incorporate within their other program the item outlined
18 below. Hazardous materials used and stored on site for the Proposed Action activities will be managed
19 according to the specifications outlined below as follows:

- 20 • **Hazardous Materials Handling Program.** A project-specific hazardous materials management
21 program will be developed prior to initiation of the Proposed Action construction. The program
22 will outline proper hazardous materials use, storage, and disposal requirements. The program will
23 identify types of hazardous materials to be used during construction activities. All personnel will
24 be provided with project-specific training. This program will be developed to ensure that all
25 hazardous materials are handled in a safe and environmentally sound manner. Employees will
26 receive hazardous materials training and will be trained in hazardous waste procedures; spill
27 contingencies; waste minimization procedures; and treatment, storage, and disposal facility
28 training in accordance with OSHA Hazard Communication.
- 29 • **Transport of Hazardous Materials.** Hazardous materials that will be transported by truck
30 include fuel (diesel fuel and gasoline) and oils and lubricants for equipment. Containers used to
31 store hazardous materials will be properly labeled and kept in good condition. Written procedures
32 for the transport of hazardous materials used will be established in accordance with U.S.
33 Department of Transportation (USDOT) and NDOT regulations. A qualified transporter will be
34 selected to comply with federal and state transportation regulations.
- 35 • **Fueling and Maintenance of Construction Equipment.** Written procedures for fueling and
36 maintenance of construction equipment will be prepared prior to construction. Vehicles and
37 equipment will be refueled on site or by tanker trucks. Procedures will include the use of drop
38 cloths made of plastic, drip pans, and trays to be placed under refilling areas to ensure that
39 chemicals do not come into contact with the ground. Refueling stations will be located in
40 designated areas where absorbent pads and trays will be available. The fuel tanks will also
41 contain a lined area to ensure that accidental spills do not occur. Drip pans or other collection
42 devices will be placed under the equipment at night to capture drips or spills. Equipment will be
43 inspected daily for potential leakage or failures. Hazardous materials such as paints, adhesives,
44 and solvents, will be kept in an approved locker or storage cabinet.

45 MM SAFE-2: Characterize Potentially Contaminated Soil. To ensure that workers, the public, and
46 wildlife are not exposed to potential contaminants, if soil is unearthed that is discolored or has an odor,
47 work will be stopped in that area. In this event, the Applicant will retain a Certified Environmental

1 Manager approved by the State of Nevada to characterize the type and extent of potential contamination.
2 The soil should then be sampled and characterized prior to further site excavation activities in the area
3 with discolored or odorous soils. If the soil is found to be contaminated based on federal or state
4 regulations, then the Applicant will implement the appropriate and relevant procedures to properly
5 characterize, contain, and dispose of the contaminated material.

6 MM SAFE-3: Adherence of the Health and Safety Program with 29 CFR, Part 1910. The
7 Applicant and Western will ensure that all health and safety and emergency plans required for employees
8 and contractors during construction, operations, and decommissioning of the Proposed Action will
9 comply with the OSHA Standards provided in federal regulation 29 CFR, Part 1910, as well as with
10 applicable state and local occupational health and safety regulations.

11 MM SAFE-4: Construction Fire Prevention Measures. The following fire prevention measures will
12 be implemented by the Applicant, Western, or their contractor during Proposed Project construction:

- 13 • Maintain a list of all relevant firefighting authorities near the Proposed Project site. The closest
14 resources to respond to a wildland fire threatening the town of Searchlight would come from
15 Clark County Fire Department Rural Station 75 located in Searchlight. This fire station is staffed
16 by volunteers. In the event of a fire on site, the Applicant and/or Western will contact both BLM
17 Fire and the Clark County Fire Department ;
- 18 • Have and maintain available fire suppression equipment in all construction areas, including but
19 not limited to water trucks, potable water pumps, and chemical fire extinguishers. Ensure an
20 adequate supply of fire extinguishers for welding and brushing crews;
- 21 • Include mechanisms for fire suppression in all heavy equipment, including fire extinguishers and
22 spark arresters or turbo-charging (which eliminates sparks in exhaust);
- 23 • Vehicle catalytic converters, on vehicles that enter and leave the project site on a regular basis,
24 will be inspected on a regular basis and cleared of all flammable debris;
- 25 • Remove any flammable wastes generated during construction on a regular basis;
- 26 • Accomplish vegetation clearing in a manner that reduces vegetation and does not create a fire
27 hazard;
- 28 • Store all flammable materials used at the construction site;
- 29 • Allow smoking only in designated smoking areas;
- 30 • Require all work crews to park vehicles away from flammable vegetation, such as dry grass and
31 brush. At the end of each workday, heavy equipment should be parked over mineral soil, asphalt,
32 or concrete, where available, to reduce the chance of fire;
- 33 • All cutting/welding torch use, electric-arc welding, and grinding operations shall be conducted in
34 an area free, or mostly free, from vegetation and an ample water supply and shovel shall be on
35 hand to extinguish any fires created from sparks. At least one person, in addition to the
36 cutter/welder/grinder, shall be at the work site to promptly detect fires created by sparks. In the
37 O&M area, all hot work will require a special operator permit.

38 MM SAFE-5: Aeronautical Considerations. The Applicant will notify FAA by filing FAA Form 7460
39 at least 30 days before construction is to begin or the date that an application for construction permit is to
40 be filed.

41 MM SAFE-6: Adherence of the Health and Safety Program with 29 CFR, Part 1926. The
42 Applicant and Western will ensure that all health and safety and emergency plans required for employees
43 and contractors during construction, operations, and decommissioning of the Proposed Action will
44 comply with the OSHA Standards provided in federal regulation 29 CFR, Part 1926, as well as with
45 applicable state and local occupational health and safety regulations

1 **4.14.4 Residual Effects**

2 With proper implementation of the APMs and MMs provided for additional prevention of, management
3 of, and response to human health and safety hazards during construction, O&M, and decommissioning
4 under the action alternatives, residual effects from exposure of human or ecological receptors to hazards
5 and hazardous materials are not anticipated.

4.15 Unavoidable Adverse Impacts and Irreversible and Irrecoverable

The CEQ regulations in 40 CFR 1502.16 and the BLM NEPA Handbook (H-1790-1, Sec. 9.2.9) require a discussion of unavoidable adverse impacts that would remain after all reasonable and effective mitigation is applied, as well as disclosure of irreversible and irretrievable commitments of resources if the Proposed Project is approved. A resource commitment is considered irreversible when direct and indirect impacts from its use limit future use options. Irreversible commitments apply primarily to nonrenewable resources, such as cultural resources, and also to those resources that are renewable only over long periods of time, such as soil productivity. A resource commitment is considered irretrievable when the use or consumption of the resource is neither renewable nor recoverable for future use. Irrecoverable commitments apply to loss of production, harvest, or use of natural resources. The following section describes irreversible and irretrievable commitments that would occur in the Proposed Project area and may be affected by construction, O&M, and decommissioning activities.

4.15.1 Geology, Soils and Minerals

Soil lost to increased erosion and vegetation production lost to conversion of land uses would be irretrievable losses. There would be an irreversible commitment of resources on land associated with the ROW and aboveground facilities.

Soil impacts could occur from spills of petroleum products or other construction equipment fluids. If a spill were to occur, the affected area would be cleaned according to the approved SPCCP. Affected soils would be irretrievably and irreversibly lost, which would be a negligible-to-minor unavoidable adverse impact.

4.15.2 Paleontological Resources

The geology of the Proposed Project site and the region is primarily relatively recent alluvial and volcanic and has low to very low potential for paleontological resources. The Proposed Project is not expected to have an irreversible and irretrievable commitment of the resource.

4.15.3 Water Resources

The Proposed Project would not use surface water or groundwater, and would instead use offsite and permitted municipal or industrial water sources for construction and decommissioning dust control and O&M activities. Therefore, the Proposed Action would not cause an irreversible or irretrievable commitment of water resources in the project area.

4.15.4 Biological Resources

Construction of the Proposed Project would result in long-term residual effects to wildlife. Approximately 229-248.5 acres of wildlife habitat would be removed resulting in the loss of shelter and foraging opportunities for wildlife in the Proposed Project area. Vegetation growth and recovery would take such a long time that, from a human viewpoint, this could be considered an irreversible or irretrievable commitment of the resource.

4.15.5 Cultural Resources

During construction of the Proposed Project cultural resources would be irretrievably committed as the resources are destroyed, or degraded during construction, operation, and maintenance of the project and could not be reused or recovered for the lifespan of the project and beyond.

4.15.6 Air Quality and Climate

Project emissions would not exceed federal or state air quality standards. Air quality would return to existing conditions after completion of the project.

1 Desert soils have a carbon storage capacity that would be lost due to construction of the Proposed Project.
2 Considering the relative proportions of ground disturbance associated with the Proposed Project area and
3 the extent of the air basin, potential impacts on existing carbon storage capacity would is considered a
4 negligible irreversible and irretrievable commitment.

5 **4.15.7 Transportation**

6 During construction, oversized loads could cause short-term, temporary transportation disruptions and
7 may require wider turning clearance. Impacts on the transportation network and impacts on traffic would
8 occur only during construction, and occasionally during maintenance activities. The Proposed Project
9 would not cause a change in the LOS for the affected roads and would not cause a permanent irreversible
10 and irretrievable commitment of the resource.

11 **4.15.8 Land Use**

12 The footprint of the Proposed Project would limit future use of between 229-248.5 acres of land for other
13 uses for the life of the project and which would be restored at decommissioning. Therefore, there would
14 not be any irreversible or irretrievable commit the resource.

15 **4.15.9 Visual Resources**

16 The WTGs and facilities structures would be removed from the project area during decommissioning and
17 the visual impacts would disappear. Therefore, there is not anticipated to be any irretrievable
18 commitments of recreational resources.

19 **4.15.10 Noise**

20 Construction, O&M, and decommissioning activities would cause increased noise levels. This would be a
21 localized and temporary effect and would cease. Therefore, there would not be an irretrievable or
22 irreversible commitment.

23 **4.15.11 Recreation**

24 Recreation can be affected by project activities. However, upon completion of decommissioning and
25 restoration activities the effects would disappear. Therefore, there is not anticipated to be an irreversible
26 or irretrievable commitment of recreational resources.

27 **4.15.12 Social and Economic Conditions**

28 The anticipated beneficial socioeconomic effects would cease following completion of decommissioning,
29 therefore; there would be no irreversible and irretrievable commitments of economic resources.

30 **4.15.13 Environmental Justice**

31 The Proposed Project is not located within an environmental justice community and would, therefore, not
32 disproportionately affect low income or minority populations. No unavoidable adverse impacts or
33 irreversible and irretrievable commitments of resources are expected.

34 **4.15.14 Human Health and Safety**

35 The generation of solid wastes (that is, construction/demolition debris, plastics, papers, cartons, steel
36 waste, pipes, cables, metal containers, and inorganic MSW) would occur during the construction phase.
37 The Applicant and their contractors/workers would handle all wastes in accordance with applicable
38 regulations, and would implement BMPs and pollution prevention and waste minimization programs.
39 Measures have been identified and incorporated into the project or applied as mitigation to reduce
40 potential impacts below federal and state safety limits. Therefore, the Proposed Action would not cause

1 an irreversible and irretrievable commitment of the resource or unavoidable adverse public health and
2 safety impacts.

3 There would be a potential for injuries or fatalities to workers during construction, O&M, and
4 decommissioning of the Proposed Project due to rare industrial hazards and accidents. Uncommon
5 industrial accidents and their associated injuries would not be completely avoidable. Safety programs and
6 BMPs would reduce, but not entirely eliminate, the potential for worker injuries or fatalities.

7 **4.16 Relationship between Short-Term Uses and Long-Term** 8 **Productivity of the Environment**

9 The NEPA requires consideration of the relationship between short-term uses of the environment and
10 long-term productivity associated with the Proposed Project. This involves the consideration of whether
11 the Proposed Project would sacrifice a resource value that might benefit the environment in the long-term
12 for some short-term value to the Applicant, Western, or the public. In reference to the Proposed Action,
13 “short-term” refers to the temporary phase of construction of the proposed project, while “long-term”
14 refers to the operational life of the proposed project and beyond. Chapter 4 of this document describes the
15 evaluation of short-term and long-term effects that could result from the 96- and 87-WTG Layout
16 Alternatives.

17 The short-term uses of the environment as a result of approving and implementing the 87- or 96-WTG
18 Layout Alternatives include those typically found with wind energy development. Short-term impacts
19 associated with construction activities and long-term effects were described previously in this chapter,
20 and include effects to the natural environment, cultural resources, and recreation resources. The impacts
21 of short-term use during construction would be mitigated by required decommissioning and habitat
22 restoration activities, thereby rendering the land available for other uses. The effects to the environment
23 during O&M and following decommissioning would constitute long-term uses of the environment that are
24 consistent with the relevant land use plan(s) administered by the BLM.

25 The two action alternatives would result in favorable short-term and long-term effects for the local and
26 regional economies. These benefits include the creation of new jobs and increased regional income; sales
27 and income tax revenues; and ROW rental receipts to the federal government.

28 As discussed earlier in Irreversible and Irretrievable Commitment of Resources, the Proposed Action and
29 alternative would result in a loss desert habitat, which in turn could adversely affect the long-term
30 productivity of the area. However, the action alternatives would both also provide a long-term benefit by
31 generating electric power without any increase in the use of non-renewable resources, such as fossil fuels,
32 which would result in a benefit to air quality and a reduction in carbon-based emissions. There would also
33 be long-term benefits from these alternatives, both of which would provide for the production of clean,
34 renewable energy consistent with federal and state goals to increase production of renewable energy to
35 help reduce dependence on fossil fuels.

4.17 Cumulative Impacts Analysis

4.17.1 Actions Considered for Cumulative Analysis

NEPA requires the consideration of cumulative impacts, which are the incremental impacts of an action when added to other past, present, and reasonably foreseeable future actions (40 CFR 1508.7) regardless of what agency (Federal or non-Federal). This analysis of cumulative impacts was prepared in accordance with those regulations and with CEQ regulations for implementing NEPA.

4.17.2 Introduction and Methodology

The CEQ principles described in *Considering Cumulative Effects under the National Environmental Policy Act* (CEQ 1997) consider that resources, ecosystems, and the human community can each experience effects.

Where there are few existing projects or developments and where the environment has not been degraded, the impacts of past and present actions combine to form existing conditions. Existing conditions were considered during the evaluation of the baseline inventory as presented in the Affected Environment sections of this document.

Cumulative impacts result “from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal), individual, or industry undertakes such action. Cumulative impacts can result from individually minor but collectively significant actions occurring over a period of time (40 CFR 1508.7). These actions include any onsite or offsite projects identified within the spatial and temporal boundaries of the action considered in this DEIS.

The following sections describe reasonably foreseeable actions and the cumulative impacts of those actions considered in conjunction with the Proposed Action, the 96 WTG Alternative and the No-Action Alternative. Because of the similarity of the Proposed Action with the 96 WTG Alternative, the cumulative impacts are expected to be similar. Where differences were identified, they are described in the applicable resource discussion. Unless otherwise noted, this analysis considers impacts that could occur over the potential life of the ROW grant.

Reasonable foreseeable future actions are those for which there are existing decisions, funding, formal proposals, or which are highly probably based on known opportunities or trends (BLM 2008a).

4.17.3 Current Setting

Mining has been central to the history and development of Searchlight, Nevada and the surrounding vicinity. After gold was discovered in the late 1800’s over 300 mines were operational and with approximately 1,500 residents Searchlight was larger than Las Vegas. Mining is ongoing on a smaller scale and the project is located in a Historic District. The project vicinity has several electric transmission lines, a nearby airport, mining, and signs of off-road vehicle activities. Development has affected the natural setting. US 95 and road development; increased access and, thus, recreational opportunities; and the development of retail, civic, aviation, and industrial facilities, such as transmission lines, pipelines, have resulted in some overall losses of wildlife habitat, decreased open space and visual character values, increased noise levels near active mines, and decreases in air quality attributable to increased emissions and fugitive dust.

4.17.4 Reasonable Foreseeable Actions

BLM had received ROW applications on three potential wind energy projects, and although there has been no action or activity on the applications for about 5 years, they were considered in this analysis.

- 1 • **Oak Creek Energy System** (N-082729) filed a ROW application with the BLM on August 10
2 2006, for a wind energy facility to be located within 34,456 acres, approximately 15 miles west of
3 the Searchlight Wind Energy Project. No additional information about the facility is available at
4 this time.
- 5 • **Great Basin Wind Energy** (N-086300) filed a ROW application with the BLM in 2006. No
6 additional information about the facility is available at this time.
- 7 • **NV Energy (N-082632)** filed a ROW application with the BLM on August 17, 2006, for a wind
8 energy facility to be located within 8,320 acres, approximately 14 miles northwest of the
9 Searchlight Wind Energy Project. No additional information about the facility is available at this
10 time.

11 Western's proposed a reasonably foreseeable action, Mead-Searchlight 230-kV Transmission Line,
12 because it was determined to be a necessary element in a Systems Improvements Study completed by
13 Western in 2011. This 800-MW capacity new transmission line would be located adjacent to Western's
14 proposed switching station and the proposed Searchlight Wind Energy Project. The new transmission line
15 would be approximately 36 miles in length connecting the proposed Searchlight switching station (to be
16 constructed 6 miles east of the town of Searchlight, Nevada) to Mead Substation, both in Clark County,
17 Nevada.. The new transmission line would consist of single circuit overhead lines supported by
18 approximately 140 direct-buried, galvanized steel monopoles, between 70 and 120 feet in height. The
19 majority of the transmission line structures will be designed as a single-circuit; however, due to
20 congestion around the Mead Substation, the four spans from the Mead Substation takeoff structure to the
21 first turning structure would be double-circuit structures. The new transmission line alignment would run
22 parallel and on the east side of an existing Davis-Mead transmission line. Both lines would share the
23 existing access road. The new transmission line ROW would be 150 feet wide.

24 Public lands managed by the BLM often have designated corridors specifically developed to concentrate
25 the effects of utility lines in locations suitable for transmission lines. The Mead-Searchlight transmission
26 line would be sited within such a 3,500-foot-wide corridor that BLM has designated for this specific use..

27 In July 2011, Western presented the Mead-Searchlight 230-kV Transmission Line to a BLM
28 interdisciplinary team to determine potential issues of concern and the NEPA documentation and
29 compliance.

30 **4.17.5 Potential Cumulative Impacts**

31 This section addresses the cumulative impacts that could result from the 87 WTG Alternative or the 96
32 WTG Alternative when considered with the three wind projects: Oak Creek, Great Basin, and NV Energy,
33 as well as the proposed Western 230-kV Mead-Searchlight transmission line. The 3 wind projects are
34 considered to ensure a thorough evaluation although they could be considered speculative and therefore
35 exempt from NEPA consideration because they were proposed in 2006 and there has been no reported
36 activity or progress since then. Specifically to date, there is no evidence that any of the projects have
37 prepared Plans of Development for the BLM, entered into power delivery agreements, or signed power
38 purchase agreements therefore there is little publicly available information about these projects. There is
39 little publicly available information developed at the time of preparation of this document regarding the
40 Western Mead-Searchlight project because it is in early stages of development and NEPA permitting
41 process with BLM and has not been developed yet.

42 CEQ regulations (40 CFR § 1502.22) addresses Federal responsibility in situations where relevant
43 information is either incomplete or unavailable related to the preparation of environmental impact
44 statements. It requires a statement that such information is incomplete or unavailable. Therefore; for the
45 reasons described in the preceding paragraph, the analysis presented in this section is necessarily largely
46 qualitative rather than quantitative because there is no specific nor detailed information available about

1 these projects' timing, acres to be disturbed, construction schedules, construction work force numbers, or
2 environmental effects.

3 After determining the potential cumulative projects, the next step is to consider the proper spatial
4 scope of the analysis - the geographic extent for each resource of concern. The extent for cumulative
5 effects varies by resource. For example, effects on soils would be largely limited to the area disturbed by
6 construction whereas emissions of dust generated by construction would be extend beyond the project
7 boundary and therefore the airshed would be the more appropriate geographical extent. Importantly, the
8 geographical boundaries should not be extended to the point that the analysis becomes unwieldy and
9 useless for decision-making. In many cases, the analysis should use an ecological region boundary
10 that focuses on the natural units that constitute the resources of concern. Consider the example of
11 Biological Resources: a common vegetation assemblage within the area of the Proposed Project is
12 Mojave Desert Scrub Habitat. This habitat type is diagnostic of the Mojave Desert which
13 encompasses some 32 million acres in California, Nevada, Arizona, and Utah. This scale is too large
14 because if the anticipated project related disturbance were compared with this total then the amount
15 would appear negligible to decision makers. If the area were limited to just Clark County then total
16 acres converted on a percentage basis would similarly be minor and immaterial because there are
17 about 3,467,118 acres of this habitat county-wide (Clark County 2008). Scaling further down, the
18 Proposed Project occurs in portions of 3 watersheds that encompass 875,840 acres (Eldorado Valley
19 339,200 acres, Colorado River 360,320 acres, and Piute Valley 216,320 acres). The project would still
20 represent just a few hundreds of one percent of the watershed lands; therefore the Project Vicinity was
21 used as the area of affect for biological and other resources. For the purposes of these analyses this is
22 defined as the project area and an immediately adjacent buffer sized 25% larger than the project area.

23 Considering the lack of specific information about the potential cumulative projects identified, it is
24 anticipated the 87- and 96-WTG Alternatives would have similar contributing effects. A summary of the
25 potential cumulative effects of the 87 WTG Alternative and the 96 WTG Alternative when considered
26 with other reasonably foreseeable projects is presented in Table 4.20-1.

1 Table 4.20-1. Cumulative Effects Summary

Resource	Area of Effect	Other Actions within Area of Affect	Potential Cumulative Impacts Within Area of Affect
Air Quality and Climate	Affected Airsheds (Hydrographic Basins 167 Eldorado Valley, 213 Colorado River, and 214 Paiute Valley)	Western Transmission Line	<p>Total construction emissions of PM₁₀ for the Proposed Project was calculated to be 97 tons per year (86 tons for the project construction and 11 for the transmission element). It is anticipated the project would be complete or largely complete before Western initiated construction. Assuming Western’s annual PM₁₀ emissions were also 11 tons, the combined yearly construction emissions totals for criteria pollutants is predicted to be less than the <i>de minimis</i> thresholds as specified under the federal General Conformity Rule (40 CFR 93); thus, combined project-related emissions are assumed to conform to SIPs and the regional air quality plans.</p> <p>In addition, Western’s transmission line, as with any approved construction or new significant source of stationary (point) air pollution in Clark County, would be required by the Clark County DAQEM to adhere to prescribed BMPs and control measures to minimize dust emissions and control engine exhaust emissions.</p>
Noise	Project Vicinity	Western Transmission Line	Temporary construction noise would be increase in the immediate vicinity if both these projects were constructed simultaneously; however, the sensitive resident receptors would be out of range of the Western Transmission Line construction noise so no additive or cumulative effect to them is anticipated.
Geology and Minerals	Project footprint	None	The proposed projects would be expected to contribute only site-specific and localized individual ground-surface alterations. Collectively, the projects would not substantially alter prevailing topography and/or surface relief in the area. The cumulative change/alteration on surface contour features would therefore be minor. Cumulative effects on mining are not anticipated to occur.
Soils	Project footprint	None	The proposed projects within the region would be expected to contribute site-specific and localized individual ground-surface alterations.
Water Resources	Watersheds (Hydrographic Basins 167 Eldorado Valley, 213 Colorado River, and 214 Paiute Valley)	Western Transmission Line	<p>The combined effects of both projects proposed are not likely to contribute to impacts on surface or groundwater resources.</p> <p>Groundwater: The Proposed Project would not result in an effect, contamination, or a reduction in volume of groundwater resources therefore there would be no cumulative contribution. Western’s proposed project is limited to shallow excavation and similarly would not reasonably be expected to affect groundwater.</p> <p>Surface Water: The Proposed Project would affect up to 0.174 acres of waters of the United States under jurisdiction of the US Army Corps of Engineers. The amount of acres of jurisdictional waters affected by the Western line is expected to be less than one half acre because transmission lines have a large degree of flexibility in locating towers. It is expected Western would span jurisdictional waters to protect the towers from flood and to reduce environmental impacts. It is likely that Western’s line would be eligible for permitting under a Nationwide Permit from the Corps of Engineers.</p>

Resource	Area of Effect	Other Actions within Area of Affect	Potential Cumulative Impacts Within Area of Affect
Biological Resources	Project Vicinity	Western Transmission Line	<p>Removal of vegetation and wildlife habitat would combine for the Proposed Project and the Western Transmission Line. As discussed earlier in this section, this would be minimal in the context of the available habitat in in Clark County.</p> <p>In the Project Vicinity the temporary and permanent disturbance for the Proposed Project Alternatives ranges from about 352 acres to 408 acres.</p> <p>The Western Transmission Line is likely to be constructed with 4-5 towers per mile depending and construction disturbance commonly is within a 100-foot diameter circle. This would result in up to 5 towers x 0.18 acres per tower x about 30 miles or 27 acres of disturbance. About 15 acres would be used for stringing the line using a about a half-acre cleared area every 2 miles. An estimated 5 acres would be used for pulling sites that would be located at angle points in the line. There would be spur roads to each tower off the existing access road.</p> <p>Without mitigation, new transmission lines could provide perching opportunities for raptors that prey on juvenile tortoises. In addition a new transmission line could represent a barrier/hazard to flying wildlife such as birds and bats. These species are susceptible to electrocutions and collision with power lines.</p> <p>It is likely that the Western Transmission Line would parallel an existing transmission line. This would represent a localize incremental contribution. To offset this potential effect, Western would construct the line in accordance with Avian Power Line Interaction Committee (APLIC) guidelines. In addition, BLM and USFWS would require implementation of mitigation measures similar to those presented in this document for Western’s transmission line to ensure that potential adverse cumulative effects do not occur.</p>
Cultural Resources	Project Vicinity	Western Transmission Line	<p>As previously discussed, construction and use of the Proposed Project and associated access roads would have direct and indirect adverse effects on sites that are eligible for NRHP listing. A Treatment Plan designed to collect scientifically and socially valuable information prior to construction would reduce impacts to an acceptable level. The measures included in the Treatment Plan would also protect cultural resources.</p>
Paleontologic al Resources	Project Vicinity	Western Transmission Line	<p>Paleontological Resources were not found to occur and therefore the Proposed Project would not contribute cumulative effects.</p>
Lands Use	Project Vicinity	Western Transmission Line	<p>The Western Transmission Line would be located in a designated BLM utility corridor therefore no changes to existing land uses would occur.</p>
Recreation	Project Vicinity	Western Transmission Line	<p>Temporary decrease in hiking opportunities due to construction activities and vehicle traffic would be cumulative if construction of both projects were to occur simultaneously. The Western project would use existing roads and therefore not increase access for recreation.</p>
Visual Resources	Viewshed	Western Transmission Line	<p>The Western Transmission Project would be located in an approved utility corridor separated from the Proposed Project by an existing transmission line, and would therefore contribute an incremental localized effect within the Piute-Eldorado Valley.</p>

Resource	Area of Effect	Other Actions within Area of Affect	Potential Cumulative Impacts Within Area of Affect
Transportation	Project Vicinity	Western Transmission Line	Collectively, the effects of either project would be temporary and short term during construction and include congestion and traffic delay.
Hazardous Materials	Project footprint	None	The anticipated projects do not overlap geographically and there would not be cumulative effects as onsite spill prevention and management plans would be required according to regulatory requirements standard protocol for BLM-approved projects.
Social and Economic Conditions	Local economy	Western Transmission Line	The combined effects of the proposed projects would likely result in beneficial impacts on socioeconomics, both regionally and locally.
Environmental Justice	Socially and/or economically disadvantaged populations in the Searchlight Area	Western Transmission Line	No Environmental Justice populations reside in the vicinity, and therefore there would be no effect or cumulative effect from either project.

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