

1 as the Wild Horse Wind Power Project ('Project'). I am a biostatistician and Project
2 Manager for WEST. My duties regarding this Project were to oversee the wildlife impact
3 assessment portion of the project, including the design and implementation of baseline
4 studies. I assisted in the preparation of the Application for Site Certification for this Project.

5
6 Q Would you please identify what has been marked for identification as Exhibit 28-1 (WE-1)?

7
8 A Exhibit 28-1 (WE-1) is a résumé of my educational background and employment
9 experience.

10
11 Q Are you sponsoring any portions of the Application for Site Certification for the Wild Horse
12 Wind Power Project?

13
14 A Yes. I am sponsoring the following sections for which I was primarily responsible for the
15 analysis and development:

16 Section 1.6.2 Cumulative Impacts, Vegetation, Wetlands, Wildlife, and Fisheries
17 (Wildlife and Fisheries portions)

18 Section 3.6 Wildlife

19 Section 3.7 Fisheries

20 Section 3.17.6 Cumulative Impacts, Vegetation, Wetlands, Wildlife, and Fisheries
21 (Wildlife and Fisheries portions)

22
23 Q What exhibits that are part of the Application that you are sponsoring?

1 A I am sponsoring the following exhibits to the Application.

2 Exhibit 14 Wildlife Baseline Study

3
4 Q Are you familiar with these sections and exhibit of the Application?

5
6 A Yes

7
8 Q Did you prepare these sections and exhibit, or, if not, did you direct and/or supervise their
9 preparation?

10
11 A Yes.

12
13 Q Is the information in these sections and exhibit within your area of authority and /or
14 expertise?

15
16 A Yes

17
18 Q Are the contents of these sections and exhibit of the Application either based upon your
19 own knowledge, or upon evidence, such as studies and reports as reasonably prudent
20 persons in your field and expertise are accustomed to rely in the conduct of their affairs?

21
22 A Yes.

1 Q To the best of your knowledge, are the contents of these sections and exhibit of the
2 Application true?

3
4 A Yes.

5
6 Q Do you incorporate the facts and content of these sections and exhibit as part of your
7 testimony?

8
9 A Yes.

10
11 Q Are you able to answer questions under cross examination regarding these sections and
12 exhibit?

13
14 A Yes

15
16 Q Do you sponsor the admission into evidence of these sections and exhibit of the
17 Application?

18
19 A Yes

20
21 Q Are there any modifications, corrections or additional information to be made to those
22 portions of the Application that you are sponsoring?

23
24 A Yes. My testimony below addresses several recent developments.

- 1 - The Applicant has recently committed to using un-guyed permanent meteorological
2 towers which will eliminate avian mortality associated with guy wires.
- 3 - The Applicant has eliminated several potential turbine locations. These alterations to
4 the layout are discussed in further detail below.
- 5 - My testimony below also addresses a recent study regarding interactions of elk
6 populations with an operating wind farm.
- 7 - WDFW provided recent additional information regarding sage grouse use of the Project
8 area and asked that additional background information recently released by the USFWS
9 be provided to EFSEC. This testimony includes a discussion of this additional sage
10 grouse information and Project sage grouse impacts and mitigation.
- 11 - An alternate project configuration has been proposed by Friends of Wildlife and Wind
12 Power. The Applicant has assessed Friends of Wildlife and Wind Power's proposal.
13 The conclusions of this assessment are presented in the Pre-Filed Testimony of Chris
14 Taylor (Exhibit 21 (CT-T)) and in my testimony below.

15

16 Q Would you please summarize and briefly describe the studies you conducted regarding
17 wildlife, your assessment of the impacts of the Project on habitat and wildlife, and
18 mitigation features that are being proposed?

19

20 A WEST designed and conducted the wildlife baseline studies for the Project. The wildlife
21 portion of the ecological baseline study consisted of surveys of avian use, aerial surveys
22 for raptor nests, and incidental observations of other wildlife. Information on sensitive
23 wildlife species that may occur in the vicinity of the Project was requested from the U.S.
24 Fish and Wildlife Service (USFWS) and Washington Department of Fish and Wildlife

1 (WDFW). The baseline avian use data, other existing information from this site, and
2 existing information from other wind project sites was used to assess the potential
3 impacts of the Project on wildlife. The duration and scope of the baseline study was
4 greater than the duration and scope of many studies of proposed wind projects in the U.S.
5 The studies were conducted using similar methods used at other projects in the Pacific
6 Northwest, and are consistent with the wind power guidelines developed by the
7 Washington Department of Fish and Wildlife .
8

9 No threatened or endangered fish species were found on site, and no impacts to such
10 species are expected from the Project. No impacts to other threatened and endangered
11 wildlife species are anticipated.
12

13 We assessed the potential for direct and indirect impacts of the Project such as bird and
14 bat collisions with turbines, direct loss of habitat from the footprint of the Project, and
15 potential disturbance and displacement impacts.
16

17 Based on the available information from other projects, it is probable that some
18 displacement effects may occur to the grassland/shrub-steppe breeding avian species
19 occupying the study area. The extent of these effects is expected to be small (zero for
20 some species and up to several hundred feet for others) and would be consistent with
21 effects from road development
22

23 Some bird and bat fatalities are anticipated from the Project. Based on the avian use
24 studies conducted at this site, and the results of studies at other projects, approximately 2
25

1 to 3 bird fatalities per turbine (for the range of turbine sizes which may be used for the
2 Project) per year are anticipated. A variety of species may be found as fatalities, and no
3 individual species are expected to account for a large proportion of the mortality, other
4 than possibly horned lark. No impacts to individual species populations are anticipated.
5 General raptor use, including nesting activity at the Proposed Project, is estimated to be
6 similar to or lower than raptor use and nesting activity at most existing new generation
7 wind facilities in the West and Midwest, and raptor mortality is predicted to be within the
8 range observed at these sites. The Proposed Project is located more than 7 miles from the
9 Columbia River, away from important nesting habitats of peregrine falcon and golden
10 eagle. Little, if any, potential impacts are expected to nesting raptors from the proposed
11 Project. No active raptor nests (visible from the air) were identified within the primary
12 Project area and only one nest (red-tailed hawk) existed within 2 miles of the proposed
13 wind turbine locations suggesting little potential for impacts to nesting raptors. Based on
14 the relative raptor use in this area, and documented raptor fatalities at other wind plants,
15 we expect the majority of raptor fatalities to be American kestrels and red-tailed hawks,
16 two very common raptor species. The predicted fatality rates are well below the fatality
17 rates that would be expected to have population consequences for the species likely to be
18 impacted. It should be noted that the fatality estimates may vary from the expected range
19 based on many factors, including turbine size and other site specific and/or weather
20 variables. Monitoring data will provide direct measures of avian mortality levels.

21
22 Based on the results of studies at other wind projects in the West, we expect
23 approximately 2 bat fatalities per turbine per year, with most of the fatalities consisting of
24 migrating hoary and silver-haired bats. The Project area has limited habitat for resident
25

1 bats, suggesting impacts similar to the other wind projects in the West. The limited
2 habitat includes small patches of trees, scattered rocky outcrops, and a few small water
3 sources, which might encourage some limited bat activity. The significance of the
4 potential impacts to bats is difficult to evaluate since there is very little information
5 available regarding migrating bat populations. Studies at operating wind turbine sites in
6 non-forested habitats in the Pacific Northwest do suggest that the vast majority of all bat
7 mortality is observed during the fall migration and dispersal period. Furthermore, hoary
8 bat, which is expected to be one of the most common fatalities at this site, is one of the
9 most widely distributed bats in North America. It should be noted that the fatality
10 estimates may vary from the expected range based on many factors, including turbine
11 size and other site specific and/or weather variables. Monitoring data will provide direct
12 measures of bat mortality at this project.

13
14 During construction some displacement impacts to big game may occur in the Project
15 area. It is my understanding most heavy construction activity (e.g., blasting, turbine
16 foundations) will not occur in the critical winter periods (December – March), thus
17 greatly reducing impacts during those critical periods. Provided heavy construction
18 activity does not occur in the critical winter months (December – March) displacement
19 impacts should be greatly reduced. Human-related activity at wind turbines during
20 maintenance activities are expected to be dramatically less than during the construction
21 period. According to the Applicant, the turbines require scheduled maintenance to be
22 performed for approximately 2 to 3 days on each unit approximately every 6 months.
23 There will be a team of 2 technicians, traveling from turbine to turbine in a service
24 vehicle, to perform the scheduled maintenance and repairs. The main site access road will
25

1 be driven daily multiple times. The fringe roads with few turbines may not be driven for
2 whole weeks. It is not known if this human activity associated with regular maintenance
3 activity will exceed tolerance thresholds for wintering mule deer or elk. If these
4 tolerance thresholds are exceeded, some animals may be displaced and utilize areas away
5 from the wind project development area. A recent study regarding interactions of elk
6 populations with operating wind farms was recently conducted by David Walter in
7 conjunction with the Rocky Mountain Elk Foundation, the Oklahoma Department of
8 Wildlife Conservation, Nature Works, and the Oklahoma Cooperative Fish and Wildlife
9 Research Unit (Exhibit 28-2 (WE-2)). The study finds no evidence that operating wind
10 turbines have a significant impact on elk use of the surrounding area.

11
12 Although unlikely to occur, cumulative impacts of the three proposed projects in Kittitas
13 County (Kittitas Valley, Desert Claim, and Wild Horse) were addressed in the EFSEC
14 DEIS for this Project. The same cumulative impacts analysis is being used for the
15 environmental impact assessments for the three projects. It was estimated that
16 approximately 450 to 750 bird fatalities may occur if all three projects are built. Actual
17 levels may be higher or lower, but the expected range of fatality rates are not expected to
18 have any population consequences for individual species, due to the expected low fatality
19 rates for individual species.

20
21 Using an approximate range of estimates from other operating wind plants in the West
22 and Mid-west (approximately 1 to 2 bat fatalities per turbine per year), annual bat
23 mortality resulting from the three projects is expected to be approximately 400 to 800 bat
24 fatalities per year. Actual levels of mortality could be higher or lower depending on
25

1 regional migratory patterns of bats, patterns of local movements through the area, and the
2 response of bats to turbines, individually and collectively.

3
4 Some temporary displacement of wintering mule deer and elk is anticipated from the
5 light winter construction activities associated with the three proposed wind power
6 projects. These temporary impacts may be higher in the unlikely event that construction
7 occurs simultaneously on two or all three of the projects, since a larger area would be
8 subjected to disturbances. It is our understanding that most heavy construction activities
9 will occur outside the critical winter period. Also, the WH site and KV and DC sites may
10 be far enough apart that cumulative impacts from construction activities may not be
11 apparent for big game.

12
13 Given the amount of existing residential development and the existing roads and
14 disturbance in the vicinity of the KVWP and DCWP projects, disturbance levels during
15 operation will not increase greatly over current levels.

16
17 The Applicant proposes several measures to minimize and mitigate impacts to wildlife.
18 These include project design features, siting, and mitigation for habitat loss. The vast
19 majority of the electrical collection system within the Project site will be underground.
20 The Project design maximizes the use of existing roads in an effort to minimize habitat
21 impacts. All turbine towers will be tubular, eliminating potential raptor perch structures
22 associated with lattice towers. The new overhead lines will be designed to minimize
23 electrocutions and will be equipped with perch guards to deter raptors and ravens from
24 perching, foraging, and nesting within the Project area. The Applicant has recently

1 agreed to install un-guyed permanent meteorological towers, which will eliminate bird
2 collisions with guy wires. Posted and enforced driving speeds of 25 mph will reduce the
3 likelihood of vehicle collisions with wildlife.
4

5 Turbines were not placed within prominent saddles along Whiskey Dick Ridge, where
6 raptors were observed crossing or would be expected to cross the ridge. Also, 9 turbine
7 locations have been eliminated along the peak of Whiskey Dick Ridge because of FAA
8 concerns. Raptor use near these previously proposed turbine locations was high relative
9 to most other locations where measurements were taken. Several turbines were initially
10 proposed in the northwest portion of the Project area along the existing north-south road
11 located to the west of the "Pines" area. The collision risks associated with these turbines
12 are likely similar to most of the turbines within the Project area. However, they were
13 located in areas that have had historic sage grouse use. In addition, some of these
14 turbines were located near a point count station that showed high relative raptor use
15 during the pre-project studies. These turbines were subsequently eliminated from the
16 layout and are not shown on the proposed Project Site Layout (Exhibit 1B).
17

18 Turbines will not directly impact the springs that were identified during habitat mapping.
19 Proposed turbine locations are no closer than 225 m from the nearest identified springs
20 (Wild Horse, Skookumchuck Heights, Dorse, Reynolds, Thorn, Government, Pine,
21 Seabrock, unnamed) and in most cases, are more than 300 m from the springs. These
22 water sources may be important for bird and big game species, but have historically been
23 impacted and degraded by livestock use. Proposed mitigation includes the exclusion of
24 livestock from the springs and this should greatly increase the habitat quality of these
25

1 areas. In addition, turbines are located on the ridges away from the riparian areas of the
2 drainages that likely contain a higher diversity of bird species. Turbines are located at
3 least 140 m from the Pines located in the central portion of the project area. Higher
4 mortality of songbirds and other species associated with these riparian corridors and near
5 these trees might be expected if turbines were sited closer to these features.

6
7 Approximately 165 acres of habitat will be lost due to the footprint of the project.
8 Another 356 acres will be temporarily impacted during construction. Protection and
9 enhancement of on-site habitat; specifically providing protection for the life of the Project
10 for over 600 acres of shrub steppe and riparian habitat in Section 27, protection of springs
11 in other areas of the Project from degradation by livestock, and development of a
12 livestock grazing management plan in coordination with the Technical Advisory
13 Committee (TAC) for the entire Project area is consistent with WDFW habitat mitigation
14 guidelines.

15
16 The Applicant proposes to develop a post-construction monitoring plan for the Project to
17 quantify impacts to avian species and to assess the effectiveness of mitigation measures
18 implemented. The monitoring plan will include the following components: fatality
19 monitoring for a minimum of two years involving standardized carcass searches,
20 scavenger removal trials, searcher efficiency trials, and reporting of incidental fatalities
21 by maintenance personnel and others.

22
23 The Applicant plans to convene a Technical Advisory Committee (TAC) to evaluate the
24 mitigation and monitoring program and determine the need for further studies or
25

1 mitigation measures. Proposed membership of the TAC will include representatives from
2 EFSEC, Washington Department of Fish and Wildlife, U.S. Fish and Wildlife Service,
3 local interest groups, Project landowners, and the Applicant. The role of the TAC will be
4 to review information regarding mitigation measures, conduct studies to monitor impacts
5 to wildlife and habitat, and address issues that arise regarding wildlife impacts during
6 construction and operation of the wind plant. The post-construction monitoring plan will
7 be presented to EFSEC for approval, based on the recommendations and in coordination
8 with the TAC.

9
10 No streams, springs, or riparian areas will be impacted by construction disturbances
11 related to wind turbines and roads. No wind turbine foundations or other infrastructure is
12 proposed to be constructed within any streams, springs, or riparian areas, as illustrated in
13 Exhibit 1-B, 'Project Site Layout'. No Project access roads cross any streams or riparian
14 areas. Environmental impacts of the proposed action upon fisheries resources may
15 include potential adverse impacts to downstream fisheries resources. However, given the
16 nearest downstream fishery is over 5 miles east of the Project site, no impacts are
17 anticipated. Provided best management practices are employed on site and compliance
18 with applicable permits regarding runoff and sediment control is maintained, no fish
19 should be affected by construction or operation of the Project.

20
21 Q. Please describe any new information on sage grouse in the Project area and any
22 anticipated impacts and mitigation.

23
24 A. *Existing Conditions*

1 In April 2004, the US Fish and Wildlife Service (FWS) published a 90-day finding in the
2 *Federal Register* (69 FR 21484) with regard to range-wide listing petitions for the
3 Greater Sage-grouse. The FWS found that the petitions and additional information
4 available in their files present substantial information indicating that listing may be
5 warranted. This positive 90-day finding triggered a FWS status review of the species
6 which will result in a 12-month finding that FWS has indicated should be available in
7 December 2004. USFWS press releases from the week of 12/6/04 indicated that
8 USFWS will be recommending that sage grouse listing is not warranted. A final
9 decision from the Director of USFWS is pending.

10
11 The U.S. Fish and Wildlife Service has recommended "... avoiding placing wind turbines
12 within 5 miles [8 km] of known leks in known prairie grouse habitat" in their *Interim*
13 *Guidelines to Avoid and Minimize Wildlife Impacts from Wind Turbines* (USFWS 2003).
14 The USFWS provided a clarification memorandum on this guidance in July 2004
15 (Manville 2004). In this memorandum, the USFWS reviewed the existing information,
16 most of which is anecdotal, regarding what is known about impacts from wind turbines,
17 other overhead structures, and other human disturbances on prairie grouse. The Service
18 reiterated that the wind siting guidelines are both draft and voluntary, and that they are
19 not meant to restrict the installation of wind turbines or wind power project facilities.

20
21 In Washington, Greater sage grouse are found in two remnant populations that are
22 separated by about 30 miles (Schroeder et al. 2000). Approximately 600 to 700
23 individuals primarily occupy Douglas County, and 300 to 400 occupy Yakima and
24 Kittitas Counties and are primarily located on the Yakima Training Center (Hays et al.

1 1998). Based on the WDFW's views, the only significant opportunity for reconnecting
2 these two populations, and achieving a potential population recovery, is through a
3 corridor of shrub steppe lands lying within the Colockum, Quilomene, and Whiskey
4 Dick Wildlife Areas (Stinson et al. 2004) which are located east of the Project site.

5
6 The Project area and surrounding lands historically have been used by sage grouse
7 (WDFW, PHS Data), most often in the fall or winter, with a few observations in the
8 spring and summer. Portions of the Project area near Government Springs are identified
9 in WDFW's PHS Database as a concentration area based on occasional past observations
10 of sage grouse in the area. However, no leks have ever been observed within the Project
11 area from previous surveys or from incidental observations, and no observations have
12 been recorded in the WDFW PHS database or the recent 2003 spring systematic searches
13 from helicopter and from the ground. A few broods were observed in the general
14 vicinity of the Project in the past, suggesting that nesting may have occurred near the
15 Project (WDFW PHS). Most historic sage grouse observations near the Project area
16 were reported along existing roads, and likely bias the true distribution of sage grouse in
17 this area. The nearest recorded historic lek (1983 record, WDFW) is more than a mile
18 south and east of the project area, and apparently has not been active for quite some
19 time. The other nearest lek location is 5 miles (16 km) south of the main Project area
20 and 2.75 miles (4.4km), at the closest point, south of the proposed PSE transmission
21 feeder line. This lek has not been documented as being occupied since 1987 (BPA
22 2003).

1 In March 2003, 25 female sage grouse were translocated from Nevada to the Yakima
2 Training Center (YTC) to potentially enhance genetic diversity of the population. Two
3 of the 25 females moved north and spent some time on and near the Project site prior to
4 dying. Apparently neither of these two females nested, and it is unclear whether these
5 two females were bred in Nevada prior to being translocated. One of the females was
6 observed approximately 1-2 miles east the project site and the 2nd female spent most of
7 its time within or north of the project area. Of the 25 females release at the Yakima
8 Training Center, 9 had nesting attempts, 4 had successful nests, and one successfully
9 fledged chicks.

10
11 Sage grouse have been translocated in at least seven states and one Canadian province,
12 although success has been very limited (Reese and Connelly 1997). There is little
13 published information documenting the success of these attempts. From 1933 to 1997,
14 over 7,000 sage grouse were translocated in at least 56 attempts to augment or
15 reestablish various populations. Only a few attempts appeared successful, and in those
16 few cases, populations remain small. The researchers concluded that translocations
17 should be viewed as experimental and not as a viable strategy to restore extirpated
18 populations of sage grouse.

19
20 Breeding season surveys conducted by WEST for the Applicant, in accordance with
21 WDFW protocols for sage grouse presence and leks at the Project site and the
22 surrounding area, included two helicopter surveys (March 20 and April 14, 2003) and 3
23 ground surveys (March 13, March 22, April 2, 2003). The ground surveys focused on
24 areas of historic observations around the Pines area and other relatively flat areas most
25

1 conducive to lekking. Approximately 95 linear miles (153 km) were flown for each
2 aerial sage grouse survey. The helicopter was kept at an elevation of approximately 250
3 ft (76 m) above the ground. No sage grouse or leks were observed during the targeted
4 surveys in March and April 2003 within and surrounding the proposed Project area.
5 Additionally, no sage grouse were observed during avian use surveys between May 10,
6 2002 and May 22, 2003. Two sage grouse pellet groups were observed on the south side
7 of Whiskey Dick Mountain during the fall of 2002.

8
9 The Project area is located within the western portion of the Colockum sage grouse
10 management unit, as defined in the Draft Washington Sage Grouse Recovery Plan
11 (Stinson et al. 2003). The Colockum management unit is approximately 128,000 acres
12 in size and provides a possible corridor between the sage grouse population in the
13 Yakima Training Center to the south of the Project and the populations to the north and
14 west of the Project in Douglas County. The potential function of the Colockum
15 management unit includes secondary breeding¹, connectivity², and seasonal uses³ with
16 uncertain, but apparently limited, potential for reintroduction and established breeding.
17 The primary limiting factor of this unit providing these functions is the rugged terrain,
18 much of which is unsuitable for sage grouse. The likelihood of establishing a viable
19 breeding population would appear low, given the low success of breeding from previous
20 translocations (Reese and Connelly 1997).

21
22
23
24 ¹ areas that may support limited breeding

25 ² providing habitat connectivity between breeding areas or seasonal use areas

³ areas likely to be used seasonally during winter, summer, or fall.

1 *Impacts*

2 Potential impacts to sage grouse from the Project can be grouped into direct impacts such
3 as collision with wind turbines or other project structures, and indirect impacts such as
4 displacement.

5
6 *Direct Impacts*

7 There is some potential for collision with powerlines (Borell 1939, Thompson 1978,
8 Braun 1998) and other project facilities and vehicles. One sage grouse fatality was
9 documented near a guyed met tower and a nearby wind turbine at the Foote Creek Rim
10 Wind Project in Wyoming (Young et al. 2002).

11
12
13 *Indirect Impacts*

14 There will be some loss of potential habitat due to the actual ‘footprint’ of the
15 development. The habitat lost from the entire permanent footprint of the project is
16 approximately 2% of the 8,600 total acres within the project boundary, much of which is
17 not currently suitable sage grouse breeding habitat.

18
19 There is very limited information, and no controlled studies, on the potential disturbance
20 and displacement impacts of wind projects on sage grouse. There is no empirical data
21 from wind farms to test the hypothesis that sage grouse avoid wind turbines. In fact, the
22 presence of young broods near turbines at the Foote Creek Rim Wind Project in
23 Wyoming suggests that nesting has likely occurred somewhere near that wind project,
24 and that wind turbines do not displace at least some females from brood rearing, and
25 possibly nesting, near wind turbines (D. Young, pers. comm.). Although pre- and post-

1 construction studies did not identify any leks within 2 miles of the Foote Creek Rim
2 Wind Project (Johnson et al. 2000), the presence of females with broods near the wind
3 project suggests there were either undocumented leks closer to Foote Creek Rim, or this
4 female nested more than 2 miles from its lek. The presence of a sage grouse fatality near
5 a guyed met tower and wind turbine also suggest that some sage grouse do not avoid
6 turbines. The Applicant has committed to the use of un-guyed permanent met towers to
7 prevent guy-wire collisions.

8
9 The impacts of the Project on future breeding and nesting in the Project area is uncertain,
10 but based on available evidence it does not appear to present a significant threat due to a
11 number of factors. At this time, there are no documented active leks within 5 miles of
12 the project area, but infrequent observations of broods suggest nesting may have
13 occurred near the Project site, and a few small, undocumented leks may have existed in
14 the past. However, it is highly uncertain whether a viable breeding population could be
15 established in this area due to other factors (e.g., failure of previous translocations,
16 topography, future land use, no known leks), even without the Project.

17
18 Most of the information regarding the impact of overhead lines and fences on sage grouse
19 is unpublished and anecdotal. Structures such as powerlines and fences may pose
20 hazards to sage grouse from collisions as well as provide additional perch sites and
21 potential nest sites for raptors that prey on sage grouse. Braun et al. (2002) has
22 recommended that overhead power lines be placed at least 0.5 mi (0.8 km) from any sage
23 grouse breeding and nesting grounds. However, two leks have continued to exist within
24 1 mile of a new overhead transmission line constructed for the Foote Creek Rim Wind

1 Project. The number of birds using the leks has been stable or increasing since the
2 installation of this transmission line in 1997 (Johnson et al. 2000, D. Young pers.
3 comm.). The Wild Horse Project has been designed incorporating measures to
4 discourage perching, nesting, and foraging by raptors and the Applicant has committed
5 to the use of un-guyed permanent met towers which will minimize the risk to sage
6 grouse from predators and of collision.

7
8 It is poorly documented how disturbance from human activity and tall structures might
9 influence sage grouse use, including sage grouse breeding. There has been some
10 apparent avoidance of suitable habitat for sage grouse lekking along the Interstate 80
11 corridor in Wyoming, Utah, Idaho, and Nevada (Connelly et al. 2004). Based on
12 analysis of historic data, an effect of the Interstate 80 on lek distribution and activity data
13 was apparent, but the cause of the effect (direct or indirect) is not understood. While this
14 study documents apparent impacts of human disturbance on sage grouse, it may not be
15 very relevant to wind power sites, given the different levels of human activity and
16 infrastructure for the Interstate compared to the expected levels of human activity and
17 infrastructure for the Project. For example, Interstate 80 gets approximately 20,000
18 vehicles per day in western Wyoming (WYDOT 2003) or roughly three orders of
19 magnitude more vehicle trips per day than are expected during regular Project
20 operations. The I-80 road corridor has a large number of other human disturbance
21 sources (railways, businesses, towns, overhead lines). One other published paper
22 suggested differences in nesting characteristics of sage grouse in disturbed and
23 undisturbed areas. Sage grouse nested farther away from leks in areas classified as
24 disturbed from natural gas development, compared to less disturbed areas (Lyon and

1 Anderson 2003). Neither of the above studies is very relevant to the proposed project at
2 the present time, since no active leks exist within or very near the Project site.

3
4 The Wild Horse Project area is located on the western edge of the proposed Colockum
5 sage grouse management area (Stinson et al. 2004). WDFW has expressed concern
6 regarding habitat connectivity and Sage grouse movements between the Douglas County
7 populations, and the Yakima and Kittitas County populations. At this time, there is no
8 documented exchange between the two populations. Limitations in movements already
9 exist due to the presence of the Columbia River and topography of the area (Stinson et
10 al. 2003). Relatively large blocks of intact shrub-steppe habitat still do exist, and will
11 continue to exist after the Project is constructed, within WDFW and WDNR lands to the
12 east of the Project site and private lands to the east and west of the Project. The
13 Quilomene Wildlife Area (17,803 acres), the Whiskey Dick Wildlife Area (28,549
14 acres), and the private lands between them have vegetation similar to the Project area,
15 but are lower in elevation. At the present time, the Project would not appear to
16 significantly impact movement between the two populations. Future changes in land use
17 on the private lands surrounding the Project area could affect movements of sage grouse.

18
19 It should be further noted that, as stated above, there are no studies that have shown that
20 sage grouse avoid wind turbines. The Wild Horse Project has been designed to be
21 permeable to wildlife movement. Turbines will be approximately 150 m apart and
22 turbine rows are at least 800 m apart. The 165 acres of permanent Project footprint is
23 only 0.13% of the total area of the Colockum Sage Grouse Management Unit. It is not
24 expected that the Project will significantly limit any potential sage grouse movement
25

1 across the Project area. However, several turbine rows which were originally considered
2 to be located along Beacon Ridge Road to the west of the Pines Area, Government
3 Springs, and Seabrook Springs, have been eliminated, leaving a distance of
4 approximately 1200 m between the nearest wind turbine and the western Project
5 boundary. This layout modification provides additional potential movement corridors
6 for sage grouse and other wildlife within the Project boundary.

7
8 *Summary of Mitigation Measures*

9 Proposed mitigation measures that could improve habitat for sage grouse and other
10 sagebrush obligate species include protection for the life of the project of over 600 acres
11 of shrub-steppe and riparian habitat in Section 27. A grazing management plan will be
12 developed in coordination with the TAC for the entire Project site which will likely
13 improve residual grass cover and potential nesting, brood-rearing, and wintering habitat
14 for sage grouse on the Project site. Livestock grazing near the springs within the Project
15 area will be eliminated, yet if fences are needed to protect these springs, they will be
16 developed using fence designs conducive to passage by other wildlife. Approximately
17 half of the Project roads follow existing road corridors (e.g., Beacon Ridge Road). An
18 aggressive weed control program will be implemented in coordination with the Kittitas
19 County Weed Control Board. Controlled access to the Project area during operations
20 will limit human activity, and in fact may reduce human disturbance levels compared to
21 current levels. Posted and enforced driving speeds of 25 mph will minimize potential for
22 vehicle collisions with sage grouse. Perch guards will be installed on the overhead lines
23 to reduce perching and nesting by sage grouse predators, such as raptors, in the Project
24 area. Un-guyed met towers will be used, eliminating guy wire hazards.

1
2
3
4 Q. Would you briefly describe any habitat connectivity issues related to the proposal of
5 Friends of Wildlife and Wind Power?

6
7 A. The Alternative Area proposed by Friends of Wildlife and Wind Power lies entirely
8 within the Whiskey Dick Wildlife Area; an area set aside by WDFW to support the
9 Colockum elk herd. The Whiskey Dick Wildlife Area is south of and adjacent to the
10 Quilomene Wildlife Area which is south of the Colockum Wildlife Area. All three areas
11 are bounded by the Columbia River to the east. The Wild Horse Wind Power Project is
12 currently located in an area which is roughly 4 miles by 5 miles and is located to the west
13 of these wildlife areas and approximately 7 miles east of the Columbia River. The
14 relocation of approximately 2/3 of the Project turbines to the Alternative Area would
15 drastically alter the layout of the Project to cover an area roughly 5 miles north-south and
16 10 miles east-west spanning an area from the current Project location to within less than 2
17 miles of the Columbia River to the east. The development of a wind power project as
18 proposed by Friends of Wildlife and Wind Power may present a far greater impact to the
19 habitat connectivity of the three above-mentioned wildlife areas, by leaving only a
20 narrow area, approximately 1.75 miles east-west, of undeveloped land between the
21 Columbia River and the Alternative Area.

22
23 Friends of Wildlife and Wind Power has expressed concern that the Project, as proposed,
24 will contribute to habitat fragmentation and may displace local elk. The Alternative Area
25 is also located in elk and deer winter range. If it were true that elk avoided operating

1 wind farms, the Alternative Area proposed by Friends of Wildlife and Wind Power may
2 pose a much greater threat to the Colockum elk herd's ability to move freely between
3 these three wildlife areas than the currently proposed Project configuration since
4 development over the Alternative Area would leave only a narrow (~1.75 mi) corridor of
5 undeveloped land to connect the Whiskey Dick Wildlife Area to the Quilomene and
6 Colockum Wildlife Areas to the north.

7
8 The Alternative Area is located closer to the Columbia River than the Proposed Project,
9 and based on this closer proximity, may have higher use by sensitive raptor species such
10 as wintering bald eagles and breeding peregrine falcons, which are found along the River.
11 Migration rates of birds (e.g., waterfowl, raptors, songbirds) closer to the Columbia River
12 may also be higher than in the area of the proposed Project, since this is a major north-
13 south topographic feature in the area. Furthermore, sage grouse habitat, as well as some
14 historic observations of sage grouse, are present near the Alternative Area (WDFW PHS).
15 The larger east-west footprint that would result if the Alternative Area were developed
16 would appear to increase the habitat fragmentation for sage grouse and decrease potential
17 habitat connectivity compared with the proposed Project.

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