BEFORE THE STATE OF WASHINGTON
ENERGY FACILITY SITING EVALUATION COUNCIL

In the Matter of the Application of: Scout Clean Energy, LLC, for Horse Heaven Wind Farm, LLC, Applicant.	DOCKET NO. EF-210011 REPLY TESTIMONY AND ATTACHMENTS OF TROY RAHMIG ON BEHALF OF SCOUT CLEAN ENERGY, LLC

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REPLY TESTIMONY OF TROY RAHMIG

ON BEHALF OF

SCOUT CLEAN ENERGY, LLC

EXH-1041_R_REDACTED

JULY 12, 2023

I. Introduction

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Q. Please describe the purpose of this rebuttal testimony.

A. I am providing reply testimony to Mr. Don McIvor's (McIvor) responsive testimony EXH-3000_R_CONFIDENTAL provided on behalf of the Counsel for the Environment (CfE), July 5, 2023 regarding materials in the updated Application for Site Certificate, Appendices, and related testimony from members of the Yakama Nation concerning the development of the Horse Heaven Clean Energy Facility (HHCEC or Project).

Q. What are some of the aspects to McIvor's testimony you would like to respond to?

A. First, I would like to acknowledge McIvor's knowledge of wind energy and wildlife issues and his understanding of the studies that have been conducted for the Project. He has previously worked on wind energy projects and is familiar with the general research and appreciated his thoughtful testimony. However, I would like to respond and elaborate on several points to add clarity and context.

Q. What specific topics would you like to respond to?

A. I would appreciate the opportunity to respond to McIvor's discussion of the Projects bat impact assessment and minimization measures, and the issues raised regarding habitat impact classifications, small mammal concerns, pronghorn antelope (*Antilocapra americana*) movement and use of the site, and the utility of the Technical Advisory Committee (TAC).

Q. To begin, what are the points you would like to clarify regarding bat impact assessments and minimization measures at the Project?

A. McIvor begins by correctly stating bats are a notoriously difficult taxon to study and our knowledge of local and regional bat populations are lacking (pg. 3 line 19). He then asserts the Project lacks a discussion of how an estimated fatality rate at the Project might impact regional bat populations and, in the context of cumulative impacts, whether bat populations can sustain such levels of mortality. He then uses an estimated fatality rate (bats/MW/yr.) from the adjacent Nine Canyon Wind Project (NCWP) as a bellwether to extrapolate the expected level of bat mortality at the Project (Erickson et al. 2003). McIvor continues to express concern whether bat populations can sustain cumulative impacts from wind-derived mortality at an undefined spatial or temporal scale. For the benefit of organization, I would like to first discuss bat population impacts, followed by the use of fatality rates, and lastly the application of minimization measures.

Bat Population Impacts

First, McIvor posits a paradoxical scenario where he states local and regional bats population data are unknown but then criticizes why impacts to bat populations were not quantified. Outside a few circumstances where populations are approximately known as with the heavily researched and federally endangered Indiana bat (*Myotis sodalis*) or gray bat (*M. grisescens*), uncertainty of bat populations is an issue that the vast majority of all wind energy facilities in the United States face and is not unique to this Project. Attempting to quantify impacts to bat populations entails understanding, to a reasonable degree of accuracy, the baseline population of 14 bat species that are present in the Columbia Plateau Ecoregion during the breeding and migratory seasons, March–November. Attempting to calculate impacts to unknown populations by essentially guessing the population size would introduce the same criticism McIvor states is currently missing.

An example of this population uncertainty is on full display in the Frick et al. (2017) paper McIvor cites where, through expert elicitation, the paper reported a wide range of opinion among experts regarding the likely continental population size for hoary bats (*Lasiurus cinereus*), ranging from a low of 10,000 to a high of 100,000,000. The "most likely" estimates of population size ranged from 1,000,000 to 10,000,000 with a median of 2,250,000 individuals (Frick et al. 2017). In defining impacts of wind

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project mortality on hoary bats, the 90% confidence region of outcomes reported in Frick et al. (2017) covers results with inferences that range from near certainty of extinction all the way to robust population growth. As Frick et al. (2017) notes, this wide range of outcomes and associated conclusions reflects a lack of empirical data. Another paper McIvor cites (Friedenberg and Frick 2021) and others (e.g., Electric Power Research Institute 2020), suffer the same deficiency where the baseline population size is too uncertain to offer accurate impact assessments, particularly at a local (Project) level. The work of Rodhouse et al. (2015, 2019) is a contemporary surrogate for regional bat population patterns that showed a decline in hoary bat occupancy (Ψ; an index of abundance) but did not observe a decline in little brown bat from data collected 2003–2010, 2016–2018 in Washington and Oregon. Their research concluded that overall occupancy rates within the Columbia Plateau are substantially lower for nearly every bat species than the surrounding mountainous and forested ecoregions of the Blue Mountains, North Cascades, Eastern Cascades and Foothills, and Northern Rockies ecoregions that surround the Columbia Plateau (updated ASC, Jansen 2023 Appendix F5).

It would take an extraordinary long-term, multi-agency, multi-million-dollar effort of summer roost counts, hibernacula exit counts, and other means throughout the entire Columbia Plateau Ecoregion to begin to understand baseline bat populations, which is well outside the scope of an individual wind energy project. At this point, I believe it would be highly speculative for a Project analysis to presume population sizes for 14 bat species that occur in the Columbia Plateau Ecoregion and calculate Project and regional affects to bat populations when baseline population sizes are largely unknown.

<u>Bat Fatality Rates</u>

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For a volant, highly migratory taxon as bats, I believe the spatial representation of fatality rates in context of regional population mortality is important to help understand local effects. The impact to bats from one wind energy facility does little to quantify the population effects at a larger scale. McIvor calculates predicted annual bat mortality at the Project from an estimated bat fatality rate at the adjacent NCWP (2.47 bats/MW/yr.; Erickson et al. 2003). There is strong concern about using bird and bat fatality estimates from NCWP to extrapolate potential impacts to the Project. McIvor's testimony that exclusively uses NCWF as a proxy to estimate bat fatalities is highly problematic. At the risk of redundancy, I will briefly address why the exclusive use of the NCWF to estimate fatality rates and mortality at the Project is problematic:

- Failure to use a statistically robust number of carcasses to calculate bias parameters in the detection process. The number of carcasses used to estimate persistence per season and size class was much lower (4 carcasses) than the 30 carcasses per season and size class that is used in contemporary studies. This resulted in a wide statistical variance.
- Search intervals at NCWP were conducted twice monthly (e.g., approximately every two weeks) yet persistence rates for small birds (assumed inclusive of bats which was another issue with this study) was an average of 11 days, thus increasing the fatality estimates.
- Analytically, the statistical framework used a naïve estimator that did not account for elements in the detection process (e.g., search area correction [Hull and Muir 2010], detection reduction factor [k; Huso et al. 2017]), that are incorporated into contemporary analyses of fatality rates.
- The 2002–2003 study at Nine Canyon represented pioneering research at one of the first wind energy facilities in the region, used best available science and

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our understanding of wind/wildlife interactions at the time; however, the comparison of fatality estimates from Nine Canyon to HHCEC should be cautioned due to the deficiencies inherent to the study design (Erickson et al. 2003).

The utility of one project to discuss potential fatality rates lacks predictive inference, you are essentially limited to a sample size of one. I calculated a mean bat fatality fate of 1.08 bats/MW/year (medium = 0.77; quartiles = 0.41–1.75) from 37 wind energy facilities during 48 studies conducted in the Columbia Plateau Ecoregion from 1999−2020 (Jansen 2023), resulting in approximately 7,292 bat fatalities at the 2021 installed capacity of 6,757 MW. The bat fatality rate was consistent with the calculations from American Wind Wildlife Institute (2020; Table 1). Although AWWI (2020) cautions the comparison of fatality rates between regions because the data were not standardized for differences in study methodology (e.g., bias trials, search area, etc.), bat fatality rates in the Pacific Northwest, namely the Columbia Plateau Ecoregion, where most of the wind energy is generated, are the lowest in the nation (Table 1).

Table 1. Estimated bat fatalities per MW by USFWS Region. Number of studies in parentheses. The region where the Project is located in **bold.**

Region	Mean	25th percentile	Median	75th percentile
Midwest (68)	10.87	4.54	8.39	11.93
Northeast (59)	8.65	2.28	3.99	12.43
U.S. (271)	6.35	1.47	3.01	7.72
Southwest (36)	6.01	1.98	3.00	6.12
Mountain Prairie (43)	3.66	1.49	2.60	3.78
Pacific Southwest (28)	1.99	0.82	1.62	3.22
Pacific (37)	**1.11**	**0.39**	**0.69**	**1.88**

Source: AWWI 2020

Absent reliable bat population data in the western US, impacts to bat populations from wind energy operation can be compared to the sources of bat mortality. In a review of 688 reports of bat mortality events (defined as studies that reported ≥ 10 bat fatalities counted or estimated) in North America from 1790–2015, O'Shea et al. (2016) classified the causes of bat mortality into nine groups including abiotic, accidental, bacterial/viral disease, biotic, contaminants, intentional killing, unexplained, wind turbines, and white nose syndrome (WNS). Anthropogenic sources (e.g., intentional killing, contaminants, wind energy) of mortality accounted for 41% of the reported sources of mortality whereas 59% of the reported mortality sources were from other causes listed above (e.g., abiotic, accidental, bacterial/viral disease, etc.; O'Shea et al. 2016). Clearly there are impacts to bats from wind energy but I think that it is important to provide context regarding the other stressors bats face.

<u>Bat Minimization Measures</u>

Turbine curtailment keeps being brought up as a method to minimize bat mortality; however, acoustic deterrents are another method that has been used (Whitby et al. 2021). For example, acoustic deterrents reduced hoary bat mortality by 78% at wind energy facilities in south Texas (Weaver et al. 2020). In another recent example, a combination of blanket curtailment and acoustic deterrents reduced hoary bat mortality by 71% at wind energy facilities in Illinois (Good et al. 2022). New, targeted smart or optimized curtailment approaches have the potential to reduce hoary bat mortality while increasing energy production compared to blanket curtailment. These examples are to illustrate that new methods and measures are continually developed to minimize bat impacts. It is for this very reason that Project-specific measures to minimize impacts to bats (or other taxon) should be left to specialists in a post-construction TAC (WDFW 2009) in an adaptive management framework (Williams et al. 2009) and not rigidly prescribed *a priori* by non-technical experts.

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Overall, I believe McIvor's assessment of how minimization measures should be implemented is correct.

Q. Turning to aspects of the habitat mitigation plan (HMP), McIvor offered several concerns that included how impacts are classified and the mitigation ratios that were used. What specific areas do you agree or disagree with?

A. I will have to reiterate the testimony Erik Jansen provided in response to the direct testimony of Yakima Nation Wildlife Biologist Mark Neutzmann. In the absence of state-recognized wildlife guidelines for utility scale solar energy in Washington, biologists must rely on various federal (e.g., USFWS 2012) and state guidelines and policies (WDFW 1999, 2009) as a baseline standard and adjust the standards based on input and consultation from WDFW area and habitat biologists. McIvor may disagree with the classification within the fenced area classified as modified habitat; however, the classification was made in consultation with WDFW and EFSEC after multiple meetings and document sharing. There are numerous studies of endangered and threatened wildlife species using solar facilities. For example, 58 observations of 27 groups of greater sage grouse (*Centrocercus urophasianus*) were observed inside the Sweetwater solar facility in Wyoming (Gerringer et al. 2022). Wilkening and Rautenstrauch (2019) listed black-tailed jackrabbit (*Lepus californicus*) inside a solar facility. Twelve federal or state threatened species have been documented using solar facilities in California including San Joaquin antelope squirrel (*Ammonspermophilus nelson*), giant kangaroo rat (*Dipodomys ingens*), San Joaquin kit fox (*Vulpes macrotis mutica*), Swainson's hawk (*Buteo swainsoni*) and burrowing owl (*Athene cunicularia*; Cypher et al. (2021). In fact, some research has documented a positive effect for some species. Boroski (2019) conducted a multi-year study at the California Valley Solar Ranch facility in San Luis Obispo County, California, examining the federally listed San Joaquin kit fox and giant kangaroo rat presence before and after the construction

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of the 250-megawatt solar facility. Operational in 2013, the solar facility was sited and designed to avoid giant kangaroo rat precincts and San Joaquin kit fox dens where feasible and facilitate species' persistence within the security fence. Through careful planning, 61% of the 427 giant kangaroo rat precincts mapped in planned construction areas were avoided during construction. Four years after construction was completed, surveys recorded an over 210% increase in the number of giant kangaroo rat precincts. Although precinct densities were higher within 15 meters of the array (11.54 precincts/hectare) compared to directly underneath the array (1.16 precincts/hectare) which were trapped and cleared prior to construction and indicated some level of recolonization (Boroski 2019). These are just several examples. As discussed in the updated Habitat Mitigation Plan (Appendix L §7.1), the Project fence design will be lifted by an average of 4 inches above grade to increase wildlife permeability for medium to small sized mammals. It is for these reasons the habitat is not considered permanently or temporarily impacted but modified. Again, WDFW guidelines do not require compensatory habitat mitigation for croplands (WDFW 2009). Although not formal, WDFW maintains internal Standard Operating Procedures that help direct solar evaluations (Ritter, M., WDFW Renewable Energy Lead, pers comm.). Further, the concept of modified habitat has evolved with WDFW through solar permitting with county planning departments and has precedent with EFSEC Projects including the Goose Prairie Solar Project in Yakima County. In addition, previous EFSEC projects, including the High Top and Ostrea projects, included modified habitat in their Habitat Management Plan. (Docket EF-220212, Revised Mitigated Determination of Non-Significance (MDNS), High Top Solar and Ostrea Solar Projects, Oct. 28, 2022, pg. 3).

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Q. There were some concerns regarding the occurrence of small mammals and how the project may affect them. Do you believe McIvor characterized the issues with small mammals appropriately.

A. Yes. I agree with McIvor's characterization of small mammals at the Project and that pre-construction surveys and avoidance measures that would be taken if a ground squirrel colony is detected. As discussed in the Habitat Mitigation Plan of the updated Application (Appendix L §7.1), adjustments to the fencing surrounding the solar arrays will include average 4" gap between the bottom of the fence and the ground and use square gauge cattle panels to increase wildlife permeability through the fence. McIvor mentioned surveys recorded Washington ground squirrels incidentally. If in the survey reports, this is an unfortunate error – only Townsends ground squirrel are found west of the Columbia River, Washington ground squirrels are east of the river.

Q. McIvor discusses the pronghorn data presented by Yakama Nation Wildlife Biologist Leon Ganuelas. Are there any aspects that you would like to comment on?

A. [redacted].

The Projects assessment of pronghorn relied on publicly available data – reports from surveys conducted by WDFW and the Yakama Nation (Oyster et al. 2015, 2017 Fidorra et al. 2019, 2021). Indeed the telemetry data were not used in the Application because it was not provided by EFSEC, WDFW, or the Yakama Nation and was only made partially available to the Applicant as a follow up request to Ganuelas's rebuttal testimony through this formal process. The follow up request was made for all

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telemetry data as displayed in Appendix A of Ganuelas's testimony to be provided in order to conduct an appropriate analysis. [redacted]

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[redacted]. McIvor mentions the East Solar as being within a north-south connectivity corridor as modeled by Washington Wildlife Habitat Connectivity Working Group. The portion of East Solar McIvor refers to has been dropped from the Project design and is no longer within the modeled corridor mentioned. The size of East Solar has been reduced by approximately 67% and moved entirely to the east side of Interstate 82, located entirely on croplands. Interstate 82 serves as a strong barrier to pronghorn dispersal, thus, impacts to pronghorn from the development of East Solar are considered none.

Q. McIvor discusses the TAC envisions a process where a range of stakeholders collaborate to advise, review, and recommend actions. Is this the process that has been used in the past?

A. Yes. I agree with McIvor's interpretation of the utility and function of the TAC. The TAC will be established prior to commercial operations with representation from, but not limited to: WDFW, the Washington Department of Natural Resources (DNR), Yakama Nation resource experts, Benton County, the USFWS and other local interest groups. The TAC will provide a neutral forum in which independent and informed parties can collaborate with the Certificate Holder, and make recommendations to the Certificate Holder and EFSEC, if the TAC deems additional studies or mitigation are warranted to address impacts that were either not foreseen in the Application or the Environmental Impact Statement (EIS), or exceed impacts that were projected

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(WDFW 2009, Section 3).

Q. Does your testimony rely on any literature to support your conclusions?

A. Yes. Please see below.

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