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UNITED STATES DEPARTMENT OF THE INTERIOR
OFFICE OF HEARINGS AND APPEALS
BOARD OF LAND APPEALS

WESTERN WATERSHEDS PROJECT, CENTER FOR BIOLOGICAL DIVERSITY, and AMERICAN BIRD CONSERVANCY, Appellants, v. BUREAU OF LAND MANAGEMENT, Respondent.	IBLA No. _______________ Appeal of the Decision Record, Finding of No Significant Impact, Environmental Assessment DOI-BLM-UT-W020-2017-0001-EA for the September 2017 Competitive Oil and Gas Lease Sale

DECLARATION OF DR. CLAIT E. BRAUN

I, Clait E. Braun, declare:

1. My name is Clait E. Braun, and I reside in Tucson, Arizona. The statements and professional judgments below are based on my scientific training, knowledge and experience, including my 40+ years of professional experience researching, studying, and managing greater sage-grouse.

I. EDUCATION AND EXPERIENCE

2. A Biographical Sketch describing my profession education and experience is attached as Exhibit 1.

3. My education includes a B.S. in Technical Agronomy from Kansas State University (1962), an M.S. in Wildlife Management from the University of Montana (1965), and a Ph.D. in Wildlife Biology from Colorado State University (1969). In addition, I have attended numerous short courses, workshops, technical sessions, etc., to remain current in my professional work and am a Certified Wildlife Biologist.

4. I spent much of my professional career with the Colorado Division of Wildlife, where I was a Research Wildlife Scientist, Wildlife Research Leader, and Avian Program Manager for a thirty-year period (1969-99). In addition, I taught as an Instructor at the University of Montana (1963-65) and Colorado State University (1966-69), and have been an invited lecturer at more than 20 U.S. and Canadian universities. I also worked as a Soil Scientist in Kansas (1961) and Montana (1964) for the U.S.D.A., Soil Conservation Service and as a Research Technician with the Montana Department of Fish and Game (1965).

5. My field research was primarily on different species of birds especially grouse (1965-2017). I specifically conducted and directed research on sage-grouse throughout Colorado from 1973 through 1999. My research on sage-grouse has caused me to review sagebrush steppe ecosystems (plants and animals) throughout all western states and adjacent provinces. This research has led to more than 300 scientific publications, mostly in peer-reviewed journals. I am lead author or co-author on more than 65 articles on sage-grouse (including greater sage-grouse and Gunnison sage-grouse) and more than 50 technical abstracts

on sage-grouse in scientific publications. Attached as Exhibit 2 is a list of scientific publications that I authored or co-authored through 2017.

6. I have remained closely involved in many research and publications regarding sage-grouse and their habitats. Relevant here, I served as Technical Editor for the "Monograph" on greater sage-grouse, which was published in book form in 2011. *See* S. T. Knick and J. W. Connelly, Editors, C. E. Braun, Technical Editor, *Greater sage-grouse: Ecology and conservation of a landscape species and its habitats*, Studies in Avian Biology No. 38 (2011).

7. I also served for many years as Editor of *The Wilson Journal of Ornithology*, a leading international ornithology journal; and I am a principal in Grouse Inc., a consulting firm.

8. I have been retained through my consulting firm by Advocates for the West to provide my professional views in this declaration, based on my scientific expertise and knowledge, as discussed below.

II. BASIS FOR TESTIMONY

9. I am closely familiar with research and scientific literature that addresses the habitat needs and biological requirements of sage-grouse, and on the factors that cause or contribute to sage-grouse population losses or declines (including from habitat loss). I have also spent innumerable hours in the field studying sage-grouse populations and habitats over the last four decades, which I have used in my own publications addressing the relationships between sage-grouse and their habitats, as well as the management implications of these relationships (including from energy development). In addition, I have supervised many graduate students conducting field research on sage-grouse.

10. I am familiar with the locations and recent available population data and trends for greater sage-grouse populations in Utah, including the Sheeprocks population at issue here. I

previously visited (6-7 May 1996) the BLM's Fillmore Field Office in Juab County to provide assistance to a colleague who was a sage-grouse biologist located there, and I am familiar with the terrain and habitat types into the western desert areas.

11. I have reviewed the BLM's Environmental Assessment DOI-BLM-UT-W020-2017-0001 and Decision Record for the September 2017 Oil and Gas Lease Sale at issue here. I have also reviewed the Utah Greater Sage-Grouse Approved Resource Plan Amendments ("Utah ARMPA") and Final Environmental Impact Statement ("FEIS"), issued by BLM and the Forest Service in 2015 as part of the National Greater Sage-grouse Planning Strategy that amended federal land use plans in Utah and across the sage-grouse range to adopt sage-grouse conservation measures.

12. I have also reviewed information through 11 August 2017 regarding the translocation of sage-grouse to supplement the Sheeprocks population, currently underway.

13. I reviewed the latest (dated 14 February 2013) Conservation Plan for Greater Sage-grouse in Utah, and also a paper by J. L. Beck, D. L. Mitchell, and B. D. Maxfield, *Changes in the distribution and status of sage-grouse in Utah*, Western North American Naturalist 63:203-214 (2003). I contributed greatly to the preparation of this paper (see page 212).

14. In preparing this declaration, I have relied on my scientific publications as well as the extensive body of other sage-grouse research and studies with which I am familiar, and my personal knowledge of Utah sage-grouse populations and habitats, including the Sheeprocks population at issue here.

III. BACKGROUND ON SAGE-GROUSE DECLINES

15. The scientific literature underscores that greater sage-grouse as a species continues to experience habitat loss and fragmentation which are contributing to population declines. In order to avoid further losses and irreparable harm both to the species, and to individual sage-grouse populations, it is essential to manage all remaining sage-grouse habitats to preserve the features needed for successful sage-grouse survival and reproduction. This is particularly true in areas, like Utah, where sage-grouse populations are now highly fragmented into peripheral populations that are small and may be teetering on the verge of extirpation, including the Sheeprocks population.

16. As the scientific literature demonstrates, greater sage-grouse historically occurred in at least 16 states and three Canadian provinces; but have been extirpated in five states and one Canadian province, and their overall distribution has become discontinuous. The changes in sage-grouse distribution have been attributed to loss, fragmentation, and degradation of habitats; and it is probable that at least one-half of the original occupied area can no longer support sage-grouse. Because of the reduced amount of available habitat, sage-grouse abundance has also markedly decreased, as much as 45 to 82 percent since 1980.

17. The known decreases in distribution and abundance have led to concern about the stability of sage-grouse populations and the health of sagebrush ecosystems on which they depend. *See* Braun 1998. These factors were cited by the U.S. Fish and Wildlife Service in its March 2010 determination that sage-grouse "warrant" protection through listing under the Endangered Species Act (ESA). *Endangered and Threatened Wildlife and Plants; 12-Month Findings for Petitions to List the Greater Sage-Grouse (Centrocercus urophasianus) as Threatened or Endangered*, 75 Fed. Reg. 13,910 (U.S. Fish and Wildlife Service, March 23,

2010). Notable among the Service's determinations are that further habitat deterioration, degradation, and losses will continue to depress and isolate sage-grouse populations; and that existing regulatory mechanisms are inadequate to redress these threats.

18. In response to that 2010 finding, the BLM and Forest Service undertook the National Greater Sage-grouse Planning Strategy as a multi-year planning process to amend federal land use plans across the range of greater sage-grouse, which culminated in 2015 with issuance of FEISs and Records of Decisions (RODs) that adopted the ARMPAs amending 98 federal land use plans, including in Utah. In October 2015, the Fish and Wildlife Service issued a new "not warranted" finding for the proposed ESA listing of greater sage-grouse, citing the ARMPAs approved by BLM and Forest Service in September 2015. These plans are now (2017) under review by the Secretary of Interior and may be altered.

19. I understand that both the ARMPAs and the Service's "not warranted" finding were predicated on the scientific findings and recommendations of the Service's "Conservation Objectives Team" (COT) Report for greater sage-grouse, which was distributed in March 2013. *See* Greater Sage-grouse (*Centrocercus urophasianus*) Conservation Objectives: Final Report (U.S. Fish and Wildlife Service, 2013).

IV. IMPORTANCE OF PROTECTING PRIORITY AREAS

20. The COT Report identified "Priority Areas for Conservation" ("PACs") as "key habitats necessary for sage-grouse conservation." COT Report, *supra*, at 36. "PACs do not represent individual populations, but rather key areas that states have identified as crucial to ensure adequate representation, redundancy, and resilience for conservation of its associated population or populations." *Id.* The PACs were identified using the best available information and designed to maintain sage-grouse representation, redundancy, and resiliency across the

landscape. *Id*. The COT Report further states that "maintenance of the integrity of PACs . . . is the essential foundation for sage-grouse conservation." COT Report, *supra*, at 36.

21. In approving the Utah ARMPA and other sage-grouse plan amendments, BLM explicitly stated that it was seeking to adhere to the COT Report recommendations in identifying priority sage-grouse habitats for increased levels of protections. *See* Record of Decision and Approved Resource Management Plan Amendments for the Great Basin Region at I-20 (U.S. Dep't of Interior, 2015) ("Great Basin ROD"). Its Priority Habitat Management Areas (PHMAs) "largely coincide with areas identified as PACs in the COT Report." *Id.*

22. Likewise, the Service's October 2015 "not warranted" determination relied on BLM's commitment to protecting PACs and adhering to COT Report recommendations in concluding that the ARMPAs constitute sufficient protection against threats to sage-grouse habitats and populations. 80 Fed. Reg. 59,857 at 59,873-77 (October 2, 2015).

23. I concur that the COT Report presented the best available science on sage-grouse conservation needs at that time, including the designation of PACs and need to protect them from threats including oil and gas development.

24. The COT Report describes the Sheeprock population as "high risk" and designates the majority of the Sheeprock occupied range as a PAC. *See* COT Report, *supra*, at 30, 71; *see also* 80 Fed. Reg. at 59,873.

V. SHEEPROCKS GREATER SAGE-GROUSE POPULATION

25. The Utah ARMPA and EIS approved in 2015 confirm that Utah sage-grouse populations remain at high risk for further declines and extirpations. Because of loss, fragmentation and degradation of historic habitat, sage-grouse populations in Utah are now largely isolated from each other with low connectivity, and have low numbers of birds.

26. The Sheeprocks greater sage-grouse population is low and on a downward trend. This population experienced an approximately 40 percent decrease over the last 4 years and annual decreases have been observed in 8 of the last 10 years. *See* Greater Sheeprocks Sage-Grouse Habitat Restoration and Hazardous Fuels Treatment at 40, DOI-BLM-UT-W020-2016-0008-EA (June 2017) ("Habitat Restoration EA").

27. There are 10 known leks within the Sheeprocks area. *Id*. The average number of males per lek has declined from a high of 36.5 in 2005 to just 6.6 in 2013. *See* Utah ARMPA, Appendix I, "Adaptive Management," at I-27. The total Sheeprock male population decreased from 190 males counted in 2006 to 25 males counted in 2016. *See* Melissa Chelak and Terry A. Messmer, *Population Dynamics and Seasonal Movements of Translocated and Resident Greater Sage-Grouse (Centrocercus urophasianus), Sheeprock Sage-Grouse Management Area: 2016 Annual Report* at 8, 14 (Dec. 2016). This projects to an estimated total population between 75 and 100 birds. This population is not viable in the short term.

28. A translocation program was initiated in 2016 in an attempt to augment the resident population in the Sheeprocks area and bolster reproduction. *See id.* The first year of the study, 2016, researchers released 40 captured sage-grouse from other Utah populations (30 females and 10 males). *Id.* at 12. The 40 translocated birds, along with 7 resident birds, were radio collared and tracked to gather data on seasonal movements and landscape use; nesting and reproduction; survivorship; and habitat characteristics.

29. Four of the 30 translocated hens (13.3%) initiated nests and one hen successfully raised a brood (1 chick) to 50 days of age. *Id.* at 6. A total of 15 of the 40 (37.5%) translocated birds died from one cause or another. The translocated birds also exhibited more extensive seasonal movements than resident birds. *Id.* at 20. The researchers explored changes to protocols

and timing of releases to increase nest initiation rates (and nest success, and chick and adult survival rates) for the 2017 season. The results of these changes, if any, are not yet available.

30. I also note that large habitat improvement projects are planned and underway in the Sheeprocks area. *See* Habitat Restoration EA, *supra*. The evidence from these types of projects in Oregon and elsewhere suggest that hen sage-grouse select areas for nesting that have a sagebrush understory even after the juniper has been removed. There is no measure yet of sustainable success in increasing the number of chicks that survive to the next year and males that recruit to leks. This could happen but it may take 10-20 years to be measurable at the population level.

31. The present data (through 2016) in terms of nest success, chick survival, and survival of adults strongly suggest the present population is not viable. Further, none of the radio-marked birds moved from the area, even though there were extensive movements within the general area, suggesting that connectivity with populations to the west, east, and southeast or in any direction was nonexistent. Despite the release of sage-grouse from other more distant populations, there was no measureable improvement in any measure of population vital rates. Thus, for the Sheeprocks population to become sustainable, changes are needed in how habitats are managed if sage-grouse in this area are to persist. Given the site characteristics (*see* Haak Declaration) and past land use practices, any changes in habitat management will likely be too slow to allow the population to recover.

VI. IMPACTS OF OIL AND GAS LEASING ON SAGE-GROUSE

Noise and Physical Disturbance

32. Greater sage-grouse are negatively impacted by activities associated with mining and oil/gas exploration and development, including construction and operation of well pads and

associated drilling and production facilities. Beyond the actual physical disturbance caused to the landscape by mining and oil/gas development activities, the impacts of roads are also negative for sage-grouse (Connelly *et al.* 2004). There are numerous examples of active leks being abandoned once road use associated with mining and oil/gas development increased in close proximity (<1 km) to leks and nesting habitat

33. "Buffers" around sage-grouse lek areas and their surrounding nesting habitats are used to define areas of potential adverse impacts from human activities, particularly energy and infrastructure development. Manier *et al.* (2014) reviewed existing studies concerning lek buffers, and recommended an "interpreted range" of lek buffers of 3.1 to 5 miles for surface disturbance and energy facilities. *See* Manier *et al.*, *Conservation Buffer Distance Estimates for Greater Sage-Grouse - A Review*, USGS Open-File Report 2014–1239 (2014). However, that study also cautioned that "for some populations, the minimum distance inferred here (5 km [3.1 mi]) from leks may be insufficient to protect nesting and other seasonal habitats." *Id*. at 2. Manier *et al.* (2014) thus recommended that, in the absence of other information, the larger 5-mile buffer should be used:

> Without population-specific information regarding the location of habitats and movement of birds, which may be utilized when available (for an example see, Colorado Greater Sage-grouse Steering Committee, 2008), this generalized protection area (circular buffer around active leks with radius of 8 km [5mi]) offers a practical tool for determining important habitat areas.

Id. at 4. Manier *et al.* (2014) further explained that even the larger 5-mile buffer does not eliminate all industrial impacts, because "the cumulative effect of development may extend across the landscape many kilometers (>10 km [6 mi]) beyond the immediately affected areas." *Id.* at 5.

34. Sage-grouse are known to select display sites (leks) that are highly visible

and have good acoustic properties. Studies report that lek activity by sage-grouse decreased downwind of energy drilling activities, and that sage-grouse numbers on leks were consistently lower within 1.6 km (1 mi) of compressor stations in Wyoming, suggesting that noise has measurable negative impacts on sage-grouse (Braun *et al.* 2002, Holloran and Anderson 2005, Blickley *et al.* 2012).

35. Clearly, the amount and likely frequency of noise associated with energy development has major negative effects on greater sage-grouse. Consequently, all drilling activities for oil and gas development should be prohibited within a minimum of 5.5 km (3.3 mi) of active leks and their associated nesting areas (Holloran 2005, Braun 2006); note this means that nesting areas must be identified and protected, not just lek areas themselves.

36. Noise and physical presence of energy exploration should be avoided in sage-grouse winter habitats, particularly known winter concentration areas where sage-grouse may be disturbed and abandon necessary habitat to survive winter conditions.

37. Studies also indicate there is a typically a time lag, of perhaps 2-10 years, in sage-grouse response to infrastructure development or other habitat changes. This time lag occurs because sage-grouse are relatively long-lived birds that will continue to return to altered breeding areas (i.e., leks, nesting, and early brood-rearing habitats), due to strong site fidelity, even despite nesting or productivity failures (lack of recruitment) caused by habitat disturbance or fragmentation associated with energy development activities. USFWS 2010 at 13928; Garton *et al.* 2011.

38. Under the best circumstances, habitat reclamation useful to sage grouse to sustain all life processes may take at least 20 to 30 years. Thus, there is substantial uncertainty that habitats useful to sage-grouse can be reclaimed and that sage-grouse populations will respond.

Connectivity and Habitat Fragmentation

39. Greater sage-grouse are a landscape scale species, requiring large expanses of sagebrush to meet all seasonal habitat requirements. The loss of habitat from fragmentation and conversion decreases the connectivity between seasonal habitats potentially resulting in the loss of the population. USFWS 2010, *supra*, at 13923. Fragmentation of sagebrush habitats has been documented as a primary cause of the decline of sage-grouse populations because the species requires large expanses of contiguous sagebrush. *Id.*

40. There are many factors that can fragment sage-grouse habitats, from conversion of habitat type (e.g., agricultural conversion of sagebrush steppe) to fences, powerlines and other tall structures, roads, reservoirs, wild fire, and prescribed burns. Essentially, any land use that subdivides blocks of intact sagebrush habitat causes fragmentation.

41. The U.S. Fish and Wildlife Service, in the March 2010 Listing Determination, defined habitat fragmentation as:

> the separation or splitting apart of previously contiguous, functional habitat components of a species. Fragmentation can result from direct habitat losses that leave the remaining habitat in noncontiguous patches, or from alteration of habitat areas that render the altered patches unusable to a species (i.e., functional habitat loss). Functional habitat losses include disturbances that change a habitat's successional state or remove one or more habitat functions; physical barriers that preclude use of otherwise suitable areas; and activities that prevent animals from using suitable habitat patches due to behavioral avoidance.

See USFWS, *supra* at 13927. I concur in this definition.

42. The 2011 Studies in Avian Biology Monograph includes analysis of connectivity of greater sage-grouse across the sagebrush landscape (Knick and Hanser 2011). They found the

average movement between population centers (leks) of sage-grouse rangewide was 16.6 km (10.3 mi) with a standard deviation of 7.3 km (4.5 mi). Leks within 18 km (11.2 mi) of each other had common features when compared to leks further than this distance. Therefore, they used a distance of 18 km (11.2 mi) between leks to assess connectivity (movement between populations), but cautioned that this distance may not accurately reflect genetic flow, or lack thereof, between populations. *Id.*

43. Their analysis of historical population data further revealed that historic leks with low connectivity have been lost, indicating that isolation of leks by distance (including habitat fragmentation) will likely result in their future loss (Knick and Hanser 2011). Small decreases in lek connectivity resulted in large increases in probability of lek abandonment. *Id.*

44. Recent studies have documented negative effects of habitat fragmentation upon sage-grouse due to energy development and associated infrastructure, including on lek persistence, lek attendance, winter habitat use, recruitment, yearling annual survival rate, and female nest site choice (USFWS 2010, p. 13928; citing Holloran 2005, p. 49; Aldridge and Boyce 2007, pp. 517-523; Walker *et al*. 2007a, pp. 2651-2652; Doherty *et al*. 2008, p. 194; Crist et al. 2017).

VII. LEASE SALE EA AND SAGE-GROUSE IMPACTS

45. I have reviewed relevant portions of the September 22, 2017 Final Environmental Assessment issued by BLM for the September 2017 Oil and Gas Lease Sale ("EA"). My review focused on the sections of the EA addressing the affected environment and environmental consequences of the proposed alternatives with respect to greater sage-grouse habitat and populations, including cumulative effects. The following sections identify several key deficiencies in the EA's analysis of impacts to greater sage-grouse.

Impacts to the Sheeprocks Population Are Likely Significant

46. In my professional judgment, the scope of potential impacts to the Sheeprocks population of greater sage-grouse are far greater than portrayed in the EA.

47. As summarized above, energy development has well-documented adverse impacts on sage-grouse, even on the scale of development forecasted in the EA. The expected effects include reduction in population size through disrupted breeding, reduced nest success, reduction in chick survival, and bird kills by vehicle strikes, along with losses in valuable seasonal habitat.

48. The EA acknowledges that sage-grouse outside the lease area will be indirectly impacted by oil and gas development, both through noise and surface disturbances on non-PHMA lease parcels and through increased development on adjacent non-federal lands. However, it fails to accurately or adequately estimate the likely extent, severity, or location of these impacts. For example, the EA understates the potential impacts on sage-grouse from development on non-PHMA portions of the lease sale parcels. It concludes that no direct or indirect impacts are anticipated to occur to greater sage-grouse from development on Parcels 004, 005, 006 and 009, as these parcels are at least one-half mile or greater from the outside boundary of the mapped PHMA. *See* Final EA at 32. The EA also concludes that any impacts from parcel 008, which is adjacent to the identified PHMA, will be restricted to one-half mile of the northern portion of this parcel, near the PHMA boundary. BLM's analysis of the impacts from development on these non-PHMA parcels (parcels 004, 005, 006, 008, and 009) rest on the flawed assumption that oil and gas development has no impacts on birds more than one-half mile away. The best available science suggests that impacts reach much farther. For example, a 2012 study commissioned by the BLM estimates that drilling activity can affect sage-grouse more than

12 miles away. *See* Rebecca L. Taylor, David E. Naugle and L. Scott Mills, *Viability analyses for conservation of sage-grouse populations: Buffalo Field Office, Wyoming* (Feb. 2012).

49. The EA also places undue emphasis on the fact that the closest active lek is 5.0 miles from the lease sale area. *See* EA at 21 (asserting that the lease area is "well beyond the edge of the 3.1 mile lek buffer established by the ARMPA . . . intended to protect nesting and early brood-rearing habitat.") While nesting habitat typically occurs within about 2 miles of leks, it has been well documented that nesting can occur as far as 12 miles away. *See, e.g.*, R.E. Autenrieth, *Sage grouse management in Idaho*, Idaho Department of Fish and Game, Wildlife Bulletin Number 9 (1981); W.L. Wakkinen, *Nest site characteristics and spring-summer movements of migratory sage grouse in southeastern Idaho,* Thesis, University of Idaho, Moscow, USA (1990); A.G. Lyon, *The potential effects of natural gas development on sage grouse (Centrocercus urophasianus) near Pinedale, WY*, Thesis, University of Wyoming, Laramie, USA (2000). Brood-rearing habitats may be even further away. A recent, long-term study of Utah greater sage-grouse tracked movements of over 16 miles from leks to seasonal habitat; females moved up to 36 miles from nest to summer habitat. Dahlgren *et al.*, *Seasonal Movements of Greater Sage-grouse Populations in Utah: Implications for Species Conservation*, Wildlife Society Bulletin 40:288–299 (2016) (converted from km to miles using data found in Tables 6 and 7). Thus, even a 5.0 mile distance will not protect all potential nesting and brood-rearing habitat.

50. The EA indicates that lease stipulations will prevent all surface disturbing activities on PHMA. However, these stipulations are subject to waivers, modifications, and exceptions. My experience and BLM's own records indicate that few requests for waivers,

exceptions, and modifications are refused. Thus, even with stipulations intended to protect sage-grouse, there is little on-site protection.

51. Further, the BLM failed to assess the habitat value of areas outside of PHMA. As acknowledged in the Utah ARMPA, habitat outside PHMA is important to improving and restoring historical sage-grouse habitat, improving connectivity, and supporting recovering sage-grouse populations. Utah ARMPA at 2-7. Moreover, there may be seasonal habitats located outside of current PHMA and GHMA designations, whether on public or private lands.

52. BLM's analysis fails, in my professional judgment, to adequately identify the likely extent and severity of impacts on the Sheeprocks population of greater sage-grouse. I conclude that authorizing oil and gas development in the lease sale area will have a significant adverse impact on the Sheeprocks sage-grouse and, given the size of the present population, lead to extirpation. The Sheeprock greater sage-grouse population is already critically endangered and not likely to recover if oil and gas development is pursued. The obvious and supportable conclusion is that the likely impact of oil/gas development in the Sheeprocks area will be to cause an already imperiled population to be extirpated.

Failure to Use Available Telemetry Data to Assess Seasonal Habitats

53. Sage-grouse typically move between seasonal habitats through the year. The attributes of sage-grouse seasonal habitats have been widely studied and reported in the literature, including articles which I have authored or co-authored (e.g., Braun *et al*. 1977; Connelly *et al* 2000; Braun *et al.* 2005).

54. Sage-grouse breeding habitats, known as "leks," are open areas or areas of low sage used for male breeding displays and mating. Once impregnated, sage-grouse hens move to nesting habitat, which is generally areas of taller sagebrush cover and good quality understory of

native grasses and forbs. Once chicks are hatched, hens and chicks move to brood-rearing habitat, which is typically wetland or more mesic areas offering forbs and insects required for chicks' rapid growth. Winter habitats are determined largely by snow depth and vegetation height, as the birds seek sagebrush exposed above snow for forage.

55. Considerable variation exists between populations with respect to the configuration of seasonal ranges and distances between leks, nesting, brood-rearing, and winter habitats. While nesting habitat may occur within about 2 miles of leks, it has been abundantly documented in the literature that nesting can occur much further—even 10-12 miles—from leks. *See* A.G. Lyon, *The potential effects of natural gas development on sage grouse (Centrocercus urophasianus) near Pinedale, WY*. Thesis, University of Wyoming, Laramie, USA (2000). Brood-rearing and winter habitats may be even further away. *See* Dahlgren et al., *Seasonal Movements of Greater Sage-grouse Populations in Utah: Implications for Species Conservation*, Wildlife Society Bulletin 40: 288–299 (2016).

56. While surveying leks is an important tool for monitoring population trends, focusing exclusively on lek locations is inadequate to provide a meaningful forecast of impacts to greater sage-grouse populations from human activity. Disturbances to nesting, brood-rearing, winter habitats, and associated migration and connectivity corridors, can significantly impact sage-grouse reproduction and recruitment.

57. It was certainly possible and feasible for BLM to undertake GIS mapping to identify seasonal habitats potentially impacted by its leasing action. A recent study by Melissa Chelak and Terry Messmer produced new telemetry data on the habitat use and seasonal movements of 47 radio-marked sage-grouse in the Sheeprocks area. *See* Chelak and Mesmer, *supra*. The EA acknowledges that BLM had access to the data. However, it states only that "no

data points were identified within the parcels being analyzed in this action." *See* Final EA at 21. Notably, BLM did not use the data to identify and map sage-grouse seasonal habitats in the areas within the vicinity of the lease parcels.

58. The failure of BLM to undertake such analysis in the EA here is wholly inconsistent with standard practices and the best available science. The U.S. Fish and Wildlife Service's October 2015 and March 2010 determinations for Endangered Species Act listing of greater sage-grouse, Federal and State sage-grouse planning efforts, and scientific literature all underscore the importance of surveying and identifying seasonal sage-grouse habitats. Agency scientists regularly map and analyze seasonal habitat locations and quality through GIS mapping as well as field inspections.

59. In assessing the potential impacts on sage grouse, the EA rested instead on prior, landscape-level mapping which designated all PHMA in the parcels as "brood-rearing" and "winter" habitat. *See* Final EA at 22, Table 5. The EA also assumes that the parcels contain no value as nesting habitat because they are farther than 3.1 miles from the closest lek. *Id.* This assumption is not supported by data. *See* A.G. Lyon, *supra*. Sage-grouse are considered a landscape scale species as their requirements for specific habitats vary seasonally depending upon vegetation, climatic, elevation, and other considerations. *See* Braun *et al.*, 2005. However, they use site specific characteristics to select breeding and nesting areas, brood rearing areas, hiding cover, and especially taller sagebrush in winter. Thus, site specific measurements are needed to be able to compare areas used seasonally over a large landscape. Mapping of sagebrush habitat at the landscape level is not adequate to reveal specific sites useful to sage-grouse.

60. While BLM officials conducted a site-visit to assess whether "fundamental elements of sage-grouse habitat" were present, the EA provides only general observations about the habitat qualities. *See* Final EA at 22. It did not report actual sage-grouse use of the habitat potentially affected by the lease sale.

61. BLM's analysis fails, in my professional judgment, to adequately identify the likely extent and severity of impacts on the Sheeprocks sage-grouse population. A more detailed analysis of the seasonal habitats potentially impacted by the proposed project, based on newly available telemetry data, should have been provided in the EA.

Failure to Assess Rangewide Impacts

62. Given the decline of sage-grouse on a range-wide basis and threats to remaining sage-grouse populations and habitats, as documented in the scientific literature, I can say without reservation that protecting the remaining sage-grouse population and habitats in the Sheeprocks area is important to prevent further decline of the species and possible Endangered Species Act listing. The failure of the EA to assess the importance of the Sheeprocks population in terms of its contributions to genetic and habitat diversity is contrary to the best available scientific literature and core conservation biology principle of "Resilience, Redundancy, and Representation" ("Three Rs").

63. I have reviewed the Declaration of Dr. Amy Haak, concerning the importance of protecting the Sheeprock Mountains PAC from a habitat diversity perspective. See Haak Declaration. I agree with her analysis and conclusion that this habitat makes a significant contribution to the "Representation" and "Redundancy" of the greater sage-grouse's conservation portfolio.

64. Specifically, I concur with Dr. Haak's analysis of the habitat composition of the Sheeprock Mountains PAC in relation to elements of historical sage-grouse habitat diversity that have been lost or diminished. I agree with her conclusion that preserving this habitat is important to maintaining adequate Representation of habitat types that were historically more prevalent, to maintaining the Redundancy of these habitat types within the sage-grouse range, and to preserving a diverse conservation portfolio for the species.

65. I likewise concur with Dr. Haak's explanation of the importance of habitat biodiversity to the long-term viability and stability of species. Communities that occupy a wide and varying landscapes—i.e., those with diverse "conservation portfolios"—are better able to withstand disturbance events and swings in environmental conditions that would destabilize with a less diverse portfolio. I also note that the principles of Resilience, Redundancy, and Representations (the "Three Rs") (but primarily Representation and Redundancy), used as guiding concepts in her analysis, are fully consistent with the COT Report and the Fish and Wildlife Service's October 2015 "not warranted" finding, which likewise underscore the importance of the "Three Rs" from a conservation biology perspective. *See* COT Report at 12; 80 Fed. Reg. at 59,872.

66. Dr. Haak has done an admirable job of displaying how the Sheeprock Mountains PAC contributes to the viability of the greater sage-grouse, from a habitat diversity perspective. This type of analysis should have been provided in the EA and fully assessed by BLM before it approved the proposed project; and the failure to do this analysis renders the EA critically flawed, in my professional judgment.

VIII. CONCLUSIONS

67. My professional analysis, based on 40+ years of research, data analysis, and scientific writing is that oil and gas development in the challenged lease sale area will exacerbate the current downward trend of the Sheeprocks population of greater sage-grouse and risk extirpation of this local population. Further, the EA does not present a scientifically credible analysis of current sage-grouse habitats and populations in the Sheeprocks area or the potential impacts of the proposed oil and gas leasing. BLM should be required to conduct a thorough analysis of existing sage-grouse conditions and analyze likely impacts before any decision is made on whether to approve the proposed action.

I declare under penalty of perjury pursuant to the laws of the United States that the foregoing is true and correct to the best of my knowledge. Executed this 25th day of October 2017, at Tucson, Arizona.

/s/ Clait E. Braun___________________
Clait E. Braun

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