NORTH Dakota | Game and Fish
Be Legendary.™

May 20, 2021

Mr. Steven Kahl
ND Public Service Commission
600 E. Boulevard, Dept. 408
Bismarck, ND 58505-0480

SUBJECT: BOWMAN WIND ENERGY CENTER, BOWMAN COUNTY, ND

Mr. Kahl,

The North Dakota Game and Fish Department (Department) was first made aware of the proposed Bowman Wind Project in May of 2017. The following year, the Department met with Apex Clean Energy (Apex) twice in person, along with several emails and phone calls, to discuss initial concerns and early guidance recommendations. However, it wasn't until after a multi-year hiatus did project proponents contact the Department to solicit official comments on the project boundary (phone call, May 7, 2020). Approximately one week later, the Department received a near-final turbine layout (email correspondence, May 19, 2020) and it was not until after our meeting on May 28, 2020 that any pre-construction surveys were provided. The Department shared concern over the lack of Apex's coordination with the state and federal wildlife agencies in our initial letter (Attachment A), and little effort to improve communication has been made since. The Department attempted to contact Apex multiple times to schedule a meeting and discuss concerns and areas of disagreement, but this offer was declined. Instead, on March 22nd, 2021, Apex sent the Department an email (Attachment B) listing how they believed they'd addressed, or reasons why they disagreed with, our concerns. The Department will use this opportunity to respond to parts of that letter.

Greater sage-grouse:

The Department's primary concern is that the project overlaps with the Greater sage-grouse Priority Conservation Area (PCA), an area the Department has recommended no further energy development take place.

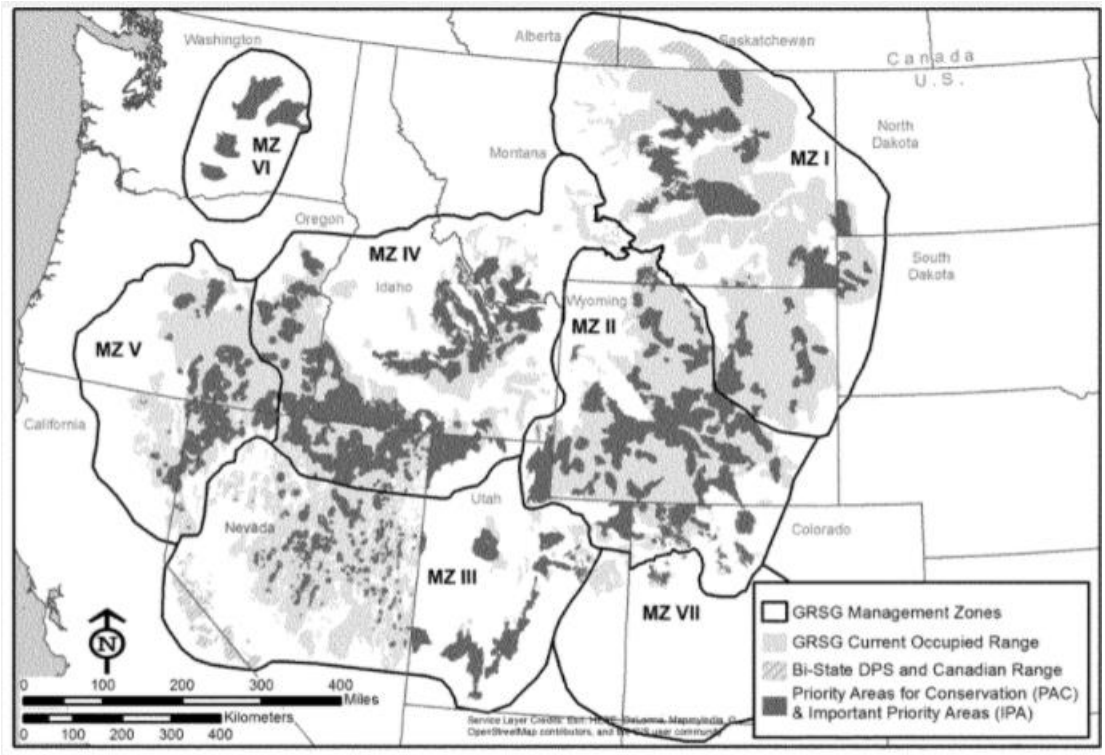
Greater sage-grouse background:

In its 2010 listing determination under the Endangered Species Act (ESA), the U.S. Fish and Wildlife Service (Service) determined that the greatest threat to Greater sage-grouse was habitat loss and fragmentation due to a variety of causes, including but not limited to, energy development, infrastructure, invasive species, and wildfire (75 FR 13910, March 23, 2010, p. 13986). The Service found it *warranted for listing* under the Act due to continued loss and fragmentation of habitat exacerbated by a lack of adequate regulatory mechanisms to address habitat loss. The primary drivers of habitat fragmentation

100 North Bismarck Expressway | Bismarck ND, 58501-5095 | 701-328-6300 | Fax: 701-328-6352

identified were renewable and nonrenewable energy development in prime sage-grouse habitats, continued expansion of supporting infrastructure, the spread of invasive annual grasses and associated changes in wildfire regimes, and the lack of adequate regulatory structures to address these impacts. When the Service evaluated the effect of infrastructure (including roads, railroads, power lines, communication towers, and fences) on sage-grouse, they concluded that it was a substantial contributor to habitat fragmentation throughout the species' range and that fragmentation from this source would increase in the future. The Service also found that infrastructure causes direct mortality from collisions and provides perches for predators. They further found that the regulations governing the location and installation of infrastructure were inadequate to address these threats. The 2010 finding concluded that habitat fragmentation, caused in part by infrastructure, and inadequate regulatory mechanisms to address the negative effects of infrastructure were significant threats to the species and likely to continue or increase into the future such that listing was warranted under the Act (75 FR 13910, March 23, 2010, pp. 13986-13988).

In an effort to prevent listing in the 2015 determination, states formulated plans such as North Dakota’ s Management Plan and Conservation Strategies for Greater sage-grouse in North Dakota to deter development within areas crucial to sage-grouse (see map below). It was these state-specific plans, along with commitments from energy developers, nonprofit organizations, and local landowners to work towards conserving the species that kept Greater sage-grouse off the Endangered Species List.



To address conservation of sage-grouse in North Dakota, the Department began the process of creating "**Management Plan and Conservation Strategies for Greater Sage-grouse in North Dakota"** (Plan) prior to 2005. The plan's long-term goal is to enhance sage-grouse habitats necessary to support a healthy self-sustaining sage-grouse population in North Dakota. The Department coordinated extensively with the United States Fish and Wildlife Service (Service), the U.S. Bureau of Land Management (BLM), U.S. Department of Agriculture- Natural Resources Conservation Service, the U.S. Forest Service, Soil Conservation Districts, and private land owners to develop the Plan. Since publication in 2015, the Department has used the Plan as the sole guiding document for sage-grouse conservation.

As described in the Plan, *"Sage-grouse have minimal tolerance of energy development resulting in significant reductions and localized extirpation (Walker et al. 2007). Oil and gas development structures, roads, pipelines, storage facilities, mines, electrical generation facilities (wind turbined), transmission lines, and other infrastructure associated with industry can decrease the available habitat base and/or effectiveness of habitat (Braun et al. 2002, Doherty et al. 2008, Holloran 2005, Lyon and Anderson 2003). Both transmission lines and fences provide perches for raptors and have been found to increase the risk of collision mortalities (Aldridge 1998, Borell 1939, Stevens et al. 2012)."* Further, since the publication of this plan, a number of other studies have addressed impacts of energy development on sage-grouse. Lek abandonment has been shown to increase and nest and brood survival has been shown to decrease as surface disturbance increases (LeBeau et al. 2014, LeBeau et al. 2020, Kirol et al. 2020).

Despite these studies, there are still many unknowns. In some instances, across their range, there has been little to no effect observed on sage-grouse adjacent to energy development. However, many of these studies do not have sufficient pre- and post- development data, provide only a small snapshot in time, or are done in an area where sage-grouse are much more common. The Department does not believe that any of these studies truly represent the unique and complex challenges to managing sage-grouse in North Dakota. Therefore, the Department continues to recommend following the guidance within the Plan, including the documents first and second recommendations **1) Discontinue permitting energy development (including oil and gas exploration, surface mining, and wind development) within PCA (priority conservation area) and 2) No surface occupancy within 4-miles of an active lek.**

In the March 22nd email, Apex inaccurately suggests that no recommendations for wind were provided in the Plan-

> *" However, due to the lack of information available at the time of the publication in 2014, no strategies or conservation actions were presented for wind energy development (Robinson 2014). As a result, Bowman Wind analyzed other State-specific documentation to identify appropriate measures to avoid and/or minimize potential impacts to sage grouse. The State Wildlife Action Plan states that conservation efforts should focus on leks and areas within 2 mile (mi; 3.2 kilometer [km]) of leks (Dyke et al. 2015). Data on sage-grouse monitoring in North Dakota indicates that areas within 2 miles of a lek are important for breeding and nesting, as 68% of all nests were located within 2 miles of a lek (average 1.7 mi [2. 7 km]; Herman-Brunson 2007, Herman-Brunson et al. 2009).*

The Department disagrees with this account. As stated above, the Department clearly specifies that discontinuing permitting energy development within the PCA is top priority in the Plan. This recommendation specifically includes wind energy development as an example of the kind of

energy that should not be permitted (page 40). Second, the State Wildlife Action Plan (SWAP) is a broad scale strategic planning document for 115 species. The SWAP provides a coarse overview for species thought to be rare or in serious decline in the state. However, when a species-specific conservation plan exists, as in this case, those plans provide a much more in-depth documentation of management considerations for the species and are the principal document used to guide conservation. Since being introduced to the project, the Department has recommended following the sage-grouse Plan.

The sage-grouse population in North Dakota is near extirpation, with less than 30 males counted in all known displaying areas (leks) each year since 2015. The Department believes that any further energy development within the PCA will reduce the chances of the sage-grouse from ever making a full recovery. This could have national consequences, as the loss of the species from part of its range (referred to by the US Fish and Wildlife Service as "representation") may bolster rationale for the Service to list the species under the Endangered Species Act, as the species has been determined to be "warranted but precluded" in the past. Because of this, the Department must continue to adamantly recommend that no further energy development take place within this landscape. Currently, the developer is proposing to site 12 turbines within the PCA (Attachment C), of which, 6 are within the 4-mile buffer of an active lek (Attachment D).

The Department acknowledges that even without additional habitat fragmentation from wind development, it may already be impossible to reverse the declining population trend of Greater sage-grouse in North Dakota. The Department continues to strive for protections for sage-grouse because they are a charismatic native species in North Dakota, and adequate remnants of the unique big sagebrush (*Artemesia tridentata*) habitat persist on our state's landscape. The Department believes it would be irresponsible to abandon efforts to protect what little remaining sage-grouse habitat we have in North Dakota.

Sharp-tailed Grouse:

The Department is also concerned about the lack of sharp-tailed grouse surveys conducted within the project boundary. The Department shared known lek locations with Apex and the consultant to supplement their lek surveys. However, it was mis-interpreted that the Department only expected surveys to be conducted at those known locations. Despite the miscommunication, the developer must use due diligence to ensure a responsible project with minimal impacts to key wildlife species and habitat. The Department has always and will continue to stress the importance of sharp-tailed grouse lek surveys, as nearly 31% of the global population falls within North Dakota and declines to the state's population will likely lead to range-wide population declines. Since the developer did not conduct surveys for new or undocumented leks, they cannot assure "the closest turbine to a sharp-tailed grouse lek is 0.6 miles" (page 72 of permit application).

PLOTS Land (Private Lands Open to Sportsmen):

Next, in the permit application, Apex specifies that PLOTS land will be closed during construction. The Department's Private Land Initiative (PLI) biologists have met with the developer and consultants on numerous occasions to discuss the impacts of wind development

on PLOTS land. It was made abundantly clear that any closure of PLOTS land to sportsmen would be a breach of contract and could possibly lead to the termination of that landowner's PLOTS contract. Many PLOTS tracts see other activity during hunting season, from farming practices to other types of development. These lands must remain open to sportsmen and this is no exception. Furthermore, specific PLOTS agreements may contain land enrolled in other USDA programs, such as the Conservation Reserve Program (CRP), which have provisions and rules pertaining to allowable activities during the primary nesting season. Construction during these times may also conflict with those program provisions.

Unbroken Grasslands:

Finally, the project landscape encompasses a significant amount of relatively undisturbed native habitats, primarily unbroken grasslands (also referred to as prairie).Unbroken grasslands defined as grasslands that have not been broken, tilled, or disturbed through the removal of native vegetation and topsoil, is the most endangered ecosystem in North Dakota and, as we are a prairie state, the majority of our native species are linked to, and dependent upon, unbroken grasslands (see Attachment C for unbroken grassland within the project boundary). Because of this, the Department has continued to stress the importance of careful micro-siting to avoid impacts to this vital ecosystem. Though Apex has made substantial improvements to their turbine layout since May 2020, this project will still have significant impacts. There are at least 4 turbines directly on unbroken grassland, and another 5 directly adjacent to unbroken grassland. With several acres of land cleared for each turbine, this will likely lead to additional loss of unbroken grassland.

According to the Apex's permit application, the company plans to "implement additional conservation actions, including the acquisition and protection of additional habitat through the use of various conservation partnerships and funding opportunities". Although it is important to protect native habitats, the Department has and continues to recommend that offsetting impacts be executed through the creation of new habitat versus acquisition or conservation easements. Not only is unbroken grassland being lost for development, large vertical structures also displace many species from the remaining habitat. Without additional habitat resources on the ground, these individuals may be lost all together, rather than just displaced. Because of this, the Department believes the most viable way to support and maintain both ecological biodiversity and local landowners is to re-establish native habitats on unprofitable or problematic agriculture land.

Conclusion:

As the Department continues to uphold its trust responsibility in stemming the decline of our state's most sensitive species, we cannot ignore the further disturbance, fragmentation, and loss of the remaining high value habitats essential to Species of Conservation Priority. The Department does not believe the developers have fully acknowledged, accepted, or addressed what is potentially "at stake" regarding the concerns we have brought forward both in coordination meetings and correspondence. This disregard is of particular concern when it involves a high-profile species such as sage-grouse. Ensuring habitats critical to these species remain viably intact on the landscape is the only way to curb their decline, prevent further

listings through the ESA, and maintain business as usual. Additional listings would ultimately impact both the state, and its agriculture and industry stakeholders, by placing additional restrictions on the development, management, and use of both public and private land. Although improvements have been made since the first turbine layout, the Department believes the project still has considerable impacts to both highly sensitive landscapes and imperiled species.

As a result, the Department suggests that Apex commit to the following recommendations:

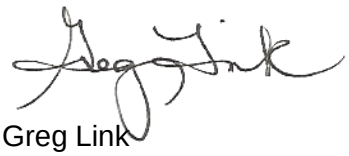
1. All proposed turbines be removed from within the Greater sage-grouse PCA and at least 4 miles from known sage-grouse leks.

2. If voluntary offsets are pursued, the primary strategy should be to re-create grasslands on broken land (e.g. cropland) rather than preserve existing grasslands.

3. In the absence of two years pre-construction sharp-tailed grouse surveys, all turbines should be sited off unbroken grasslands to avoid disturbance to any leks which may be present.

4. Acknowledge that PLOTS tracts agreements cannot be altered without landowner and Department consent.

Sincerely,



Greg Link

Chief, Conservation and Communications Division

Cc: Drew Becker, US Fish and Wildlife Service
Ryan Henning, Apex
Lynn Brackel, Bowman County Commission
Jared Janikowski, Bowman County Planning and Zoning

Literature Cited

Aldridge, C. L. 1998. Status of the Sage Grouse (Centrocercus urophasianus urophasianus) in Alberta. Alberta Environmental Protection, Wildlife Management Division, and Alberta Conservation Association, Wildlife Status Report No. 13, Edmonton, AB. 23 pp.

A. E. Borell, Telephone Wires Fatal to Sage Grouse. The Condor, Volume 41, Issue 2, 1 March 1939, Pages 85–86, https://doi.org/10.1093/condor/41.2.85a

Braun, C. E., O. O. Oedekoven, and C. L. Aldridge. 2002. Oil and Gas Development in Western North America: Effects on Sagebrush Steppe Avifauna with Particular Emphasis on Sage-grouse. Transactions of the North American Wildlife and Natural Resources Conference 67:337-349.

Doherty, K. E., D. E. Naugle, and B. L. Walker, 2010. Greater Sage-Grouse Nesting Habitat: The Importance of Managing at Multiple Scales. Journal of Wildlife Management 74:1544-1553.

Holloran, M. J. 2005. Greater Sage-Grouse (Centrocercus urophasianus) Population Response to Natural Gas Field Development in Western Wyoming. University of Wyoming Laramie.

Kirol, C.P., K.T. Smith, N.E. Graff, J.B. Dinkins, C.W. LeBeau, T.L. Maechtle, A.L. Sutphin, and J.L. Beck. 2020. Greater sage-grouse response to the physical footprint of energy development. Journal of Wildlife Management 84:989–1001.

LeBeau, C. S., J. L. Beck, G. D. Johnson, and M. J. Holloran. 2014. Short-term impacts of wind energy development on Greater Sage-Grouse Fitness. The Journal of Wildlife Management 78(3):522-530.

LeBeau, C., S. Howlin, A. Tredennick, and K. Kosciuch. 2020. Grouse Behavioral Response to Wind Energy Turbines: A Quantitative Review of Survival, Habitat Selection, and Lek Attendance. Prepared for the National Wind Coordinating Collaborative, Washington, D.C. Prepared by Western EcoSystems Technology, Inc. (WEST).

Lyon, A. G., and S. H. Anderson. 2003. Potential Gas Development Impacts on Sage Grouse Nest Initiation and Movement. Wildlife Society Bulletin 31:486-491.

Robinson A. C. 2014. Management Plan and Conservation Strategies for Greater Sage-Grouse in North Dakota. North Dakota Game and Fish Department. Bismarck, ND, USA.

Stevens, B. S., J. W. Connelly, and K. P. Reese. 2012. Multi-Scale Assessment of Greater Sage-Grouse Fence Collision as a Function of Site and Broad Scale Factors. Journal of Wildlife Management 76:1370-1380.

Walker, B. L. 2007. Greater Sage-Ggrouse Population Response to Energy Development and Habitat Loss. Journal of Wildlife Management 71:2644-2654.

Attachment A – Original NDGF letter

"VARIETY IN HUNTING AND FISHING"

NORTH DAKOTA GAME AND FISH DEPARTMENT

100 NORTH BISMARCK EXPRESSWAY BISMARCK, NORTH DAKOTA 58501-5095 PHONE 701-328-6300 FAX 701-328-6352

19 June 2020

Scott Jansen
Senior Development Manager
Apex Clean Energy
8665 Hudson Blvd North, Suite 110
Lake Elmo, MN 55042

Dear Mr. Thomas:

RE: Requesting Comments on an up to 200-megawatt Wind Farm in Bowman County, North Dakota

The North Dakota Game and Fish Department (Department) was first introduced to the Bowman Wind Farm in fall of 2018. In early coordination meetings, the Department expressed concerns on the negative impacts the project may have on native habitats, particularly, unbroken grasslands, as well as species of concern such as the Greater Sage-Grouse. Despite these concerns, there has been virtually no coordination during project development. It wasn't until receiving your letter, dated May 11, 2020, that the Department was solicited for official comments on the project boundary. However, only one week later, the Department received a near-final turbine layout (email correspondence, May 19, 2020). Further, it was not until after our meeting on May 28, 2020 that any pre-construction surveys were shared. In this letter, the Department will provide initial comments based on the project boundary and turbine locations only. Comments, questions, and/or concerns based on the wildlife reports will be provided once the Department has had sufficient time to review all documents. However, with an expectation to submit a permit application to the Public Service Commission in July 2020, these discussions and information-sharing should have taken place long ago.

First and foremost, the project landscape encompasses a significant amount of relatively undisturbed native habitats (Map A). Native prairie is the most endangered ecosystem in North Dakota and, as we are a grassland state, the majority of our native species are linked to, and dependent upon, prairie. Disturbance, fragmentation, and loss of native prairie have adversely impacted a wide variety of species and these negative impacts will only continue to compound as more development takes place on the landscape. The remaining tracts of unbroken prairie, regardless of size, are becoming more and more vital to many declining bird and pollinator species. This habitat supports 30 or more of the 115 Species of Conservation Priority identified in the North Dakota State Wildlife Action Plan (Dyke et. al 2015). For species of conservation priority, such as the Chestnut-collared Longspur with a trend of -4.3 (4.3% of the population is lost annually), Lark Bunting with a trend of -3.4, and Grasshopper Sparrow with a trend of -2.8 (Breeding Bird Survey trend data, U.S. Department of Interior), the loss and fragmentation of native prairie in the project area may further negatively impact these rapidly declining species (Maps B, C, and D).

Wetlands are another productive wildlife habitat in North Dakota, supporting 54 Species of Conservation Priority, as well as a considerable number of waterfowl, shorebirds and cranes throughout the year. Although wetlands within the project area are minimal, the resources they provide are still of value to many of our native species, especially in a landscape where these resources are so limited.

Finally, although the Department believes the best way to protect our species of conservation priority is by taking a habitat-focused approach, we would also like to reiterate the following species-specific concerns.

- Greater Sage-Grouse have been experiencing sharp declines nationwide, have a highly restricted geographic range in North Dakota, and have been shown to be negatively impacted by energy development, including wind development. For these reasons, the Department's first recommendation is to discontinue permitting energy development within the Priority Conservation Areas. Further, the Department also recommends no surface occupancy within 4 miles of an active sage-grouse lek (active is defined by being attended by ≥1 male Sage-grouse in the previous 5 years) (Map E).

- Nearly 31% of the global population of Sharp-tailed Grouse falls within North Dakota and declines to the state's population will likely lead to range-wide population declines. Sharp-tailed Grouse are a high-valued upland game bird, and because research indicated that prairie grouse may be adversely affected by energy development, it is important that lek surveys be conducted to understand the risk associated with development. The Department does not survey the entire state for lek activity; however, based on counts conducted in nearby areas, it can be estimated that there are approximately 0.5-1 Sharp-tailed Grouse leks per square mile in areas predominated by grassland habitats (Map F).

- The greatest density of Golden Eagle nests in the state lies along the Little Missouri River, west of the project boundary. Golden Eagles have also been known to use the project area quite extensively (Map G). Further, as Bald Eagle numbers increase each year in North Dakota, it is possible that Bald Eagle nests may be found anywhere within the project boundary where large trees are present. Therefore, it is highly recommended that Apex work closely with the United States Fish and Wildlife Service to comply with federal law regarding both Golden and Bald Eagles.

- Bats are long-lived, reproduce slowly, and migrate long distances, making them particularly susceptible to wind development. Acoustic surveys should begin at a minimum two years pre-construction to assess the risk the project poses to local bat populations.

- Whooping Cranes are a federally listed endangered species that use a wide variety of shallow wetlands for roosting and foraging. Though risk may be low within this project boundary, the Department recommends Apex contact HAPET in Bismarck to request the Whooping Crane model of predicted use of landscapes.

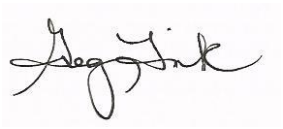
The Department has a number of resources available for the benefit of the developer and consultant, including maps and information on native habitats, priority areas, and sensitive species. Core native habitat layers are available via Esri REST Services https://gf.nd.gov/maps/data then selecting North Dakota Game and Fish Department Species Range and Habitats. In early 2020, the North American Migratory Bird Joint Ventures released a Potentially Undisturbed Lands report and GIS layer. Again, if project proponents had maintained better communication with the Department during project development, you would have been aware of these resources earlier on. Including the Department's stance on avoiding siting wind turbines and associated infrastructure on any size tract of unbroken grassland. It appears more than half of the turbines (from the near-final layout) will be sited on unbroken grassland which is both disappointing and disconcerting considering the efforts other wind proponents have recently made to avoid destroying this irreplaceable habitat. The Department also recommends working with the U.S. Fish and Wildlife Service, as any state guidelines or recommendations do not relieve the developer of its obligations to comply with any applicable federal regulations. It is to our knowledge that the Service provided comment on many of these issues in a 2019 letter.

As we continue to address the challenges of stemming the decline of our state's most sensitive species, we cannot endorse or consent to the disturbance, fragmentation, and loss of the remaining high value habitats essential to Species of Conservation Priority without recommending that suitable replacement or offsets be applied back onto the landscape. Ensuring these habitats remain on the landscape is the only way to stem the decline of these species and prevent further listings through the Endangered Species Act, which could impact both the state and its citizens by placing further restrictions on the development and management of both private and public land. The Department has stressed the importance of following the best available science in determining impacts and voluntary offsets. The best science addressing North Dakota resources are Loesch et al. 2013, Shaffer and Buhl 2016, and Shaffer et

al. 2019 and these papers should be used to help guide Apex if it is decided that a voluntary offset package should be created.

As Apex moves forward with this project, the Department requests to remain informed. To accurately analyze the project and provide valuable feedback to the PSC, it is important that the Department receives all documents, including wildlife surveys, spatial data, and any voluntary offsets being proposed 100 days prior to the hearing date.

Sincerely,



Greg Link

Chief, Conservation and Communications Division

Cc: Drew Becker, US Fish and Wildlife Service
ND Public Service Commission
Bowman County Planning and Zoning

References:

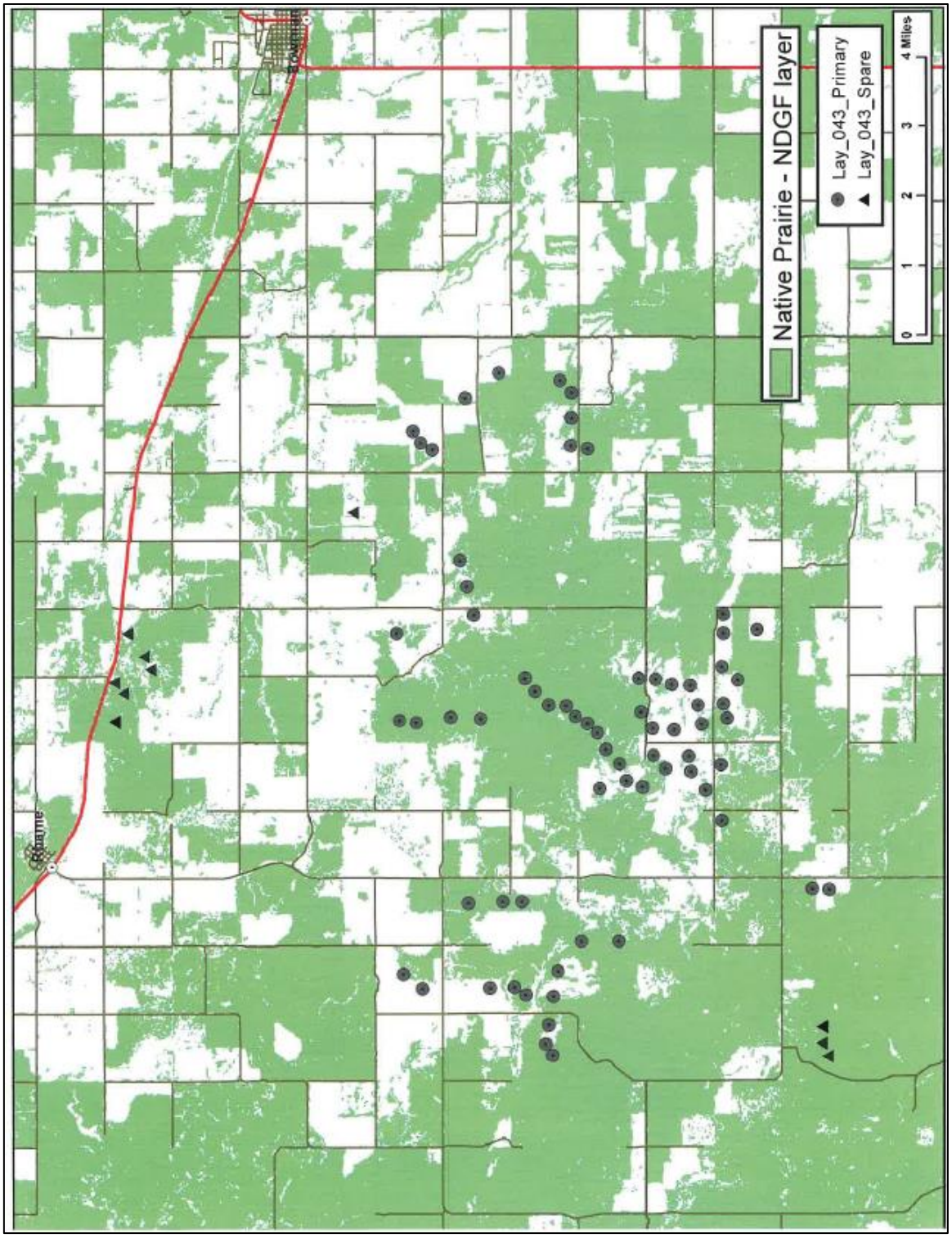
Dyke, S. R., S. K. Johnson, and P. T. Isakson. 2015. North Dakota State Wildlife Action Plan. North Dakota Game and Fish Department, Bismarck, ND.

Loesch, C. R., J. A. Walker, R. E. Reynolds. J. S. Gleason, N. D. Niemuth, S. E. Stephens, and M.A. Erickson. 2013. Effect of wind energy development on breeding duck densities in the Prairie Pothole Region. Journal of Wildlife Management 77:587-598.

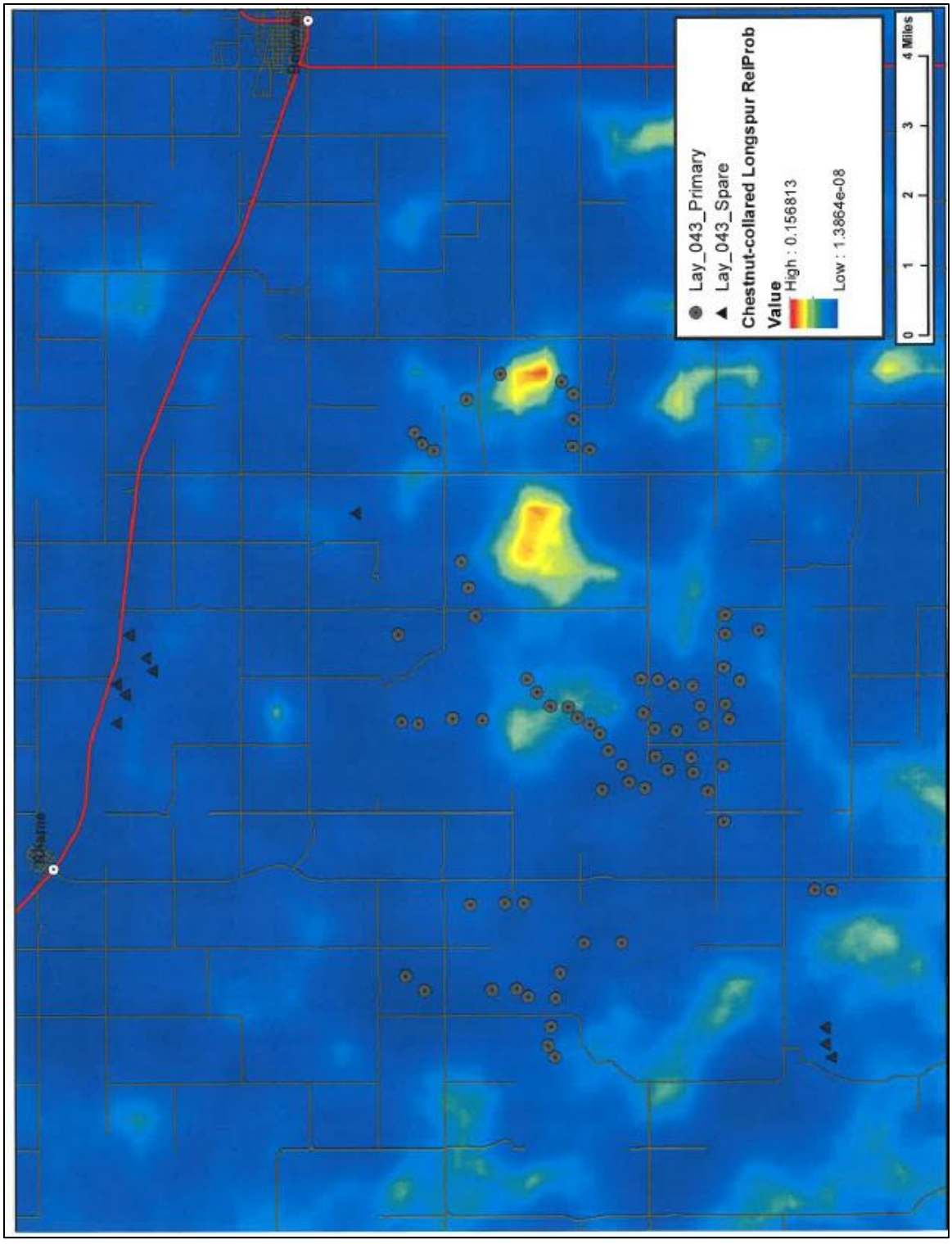
Shaffer, J. A., C. R. Loesch., D. A. Buhl. 2019. Estimating offsets for avian displacement effects of anthropogenic impacts. Ecological Applications 29(8): e01983. 10.1002/eap.1983

Shaffer, J. A. and D. A. Buhl. 2016. Effects of wind-energy facilities on grassland bird distributions. Conservation Biology 30:59-71.

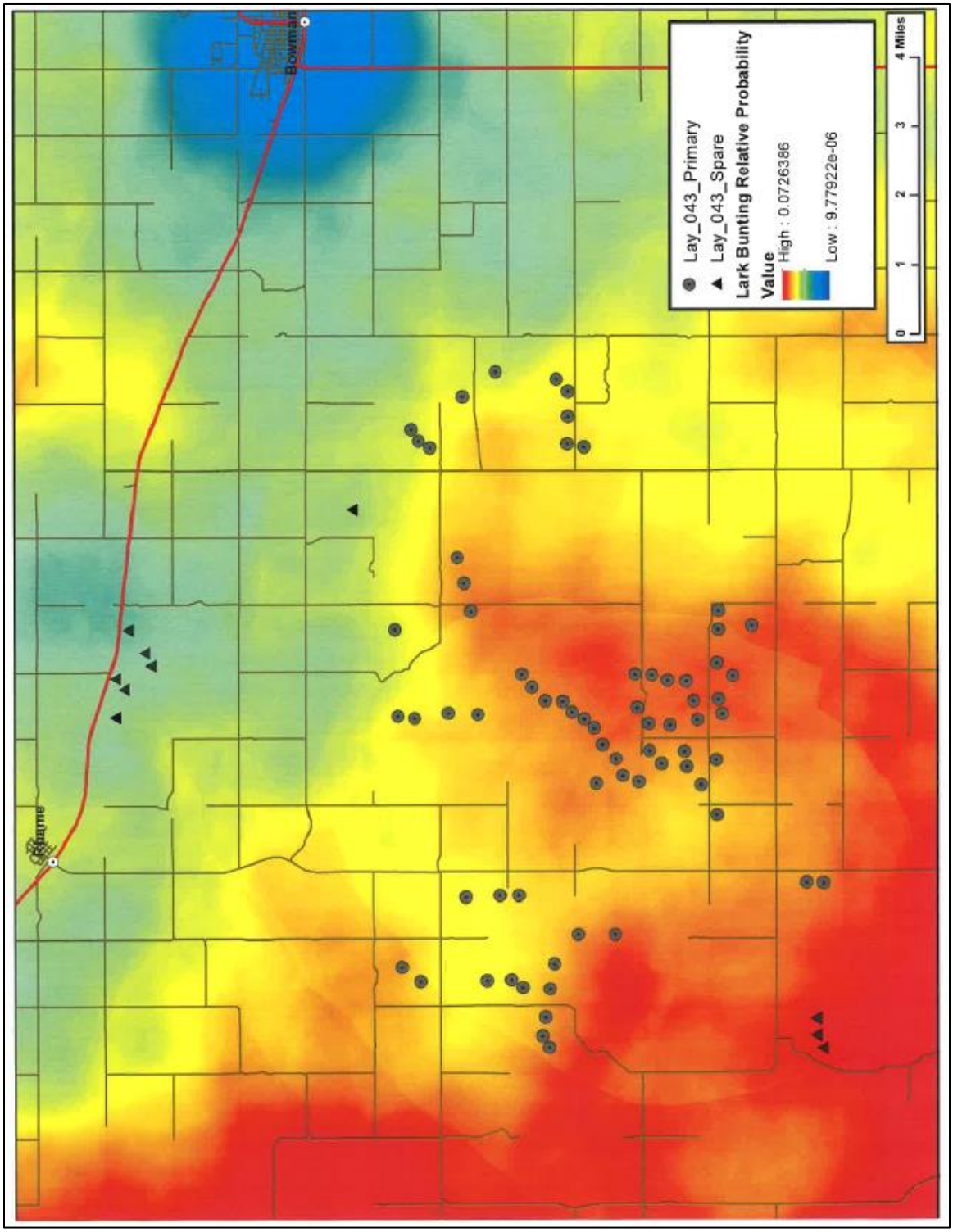
Map A


Native Prairie - NDGF layer
Lay_043_Primary
Lay_043_Spare
0
1
2
3
4 Miles

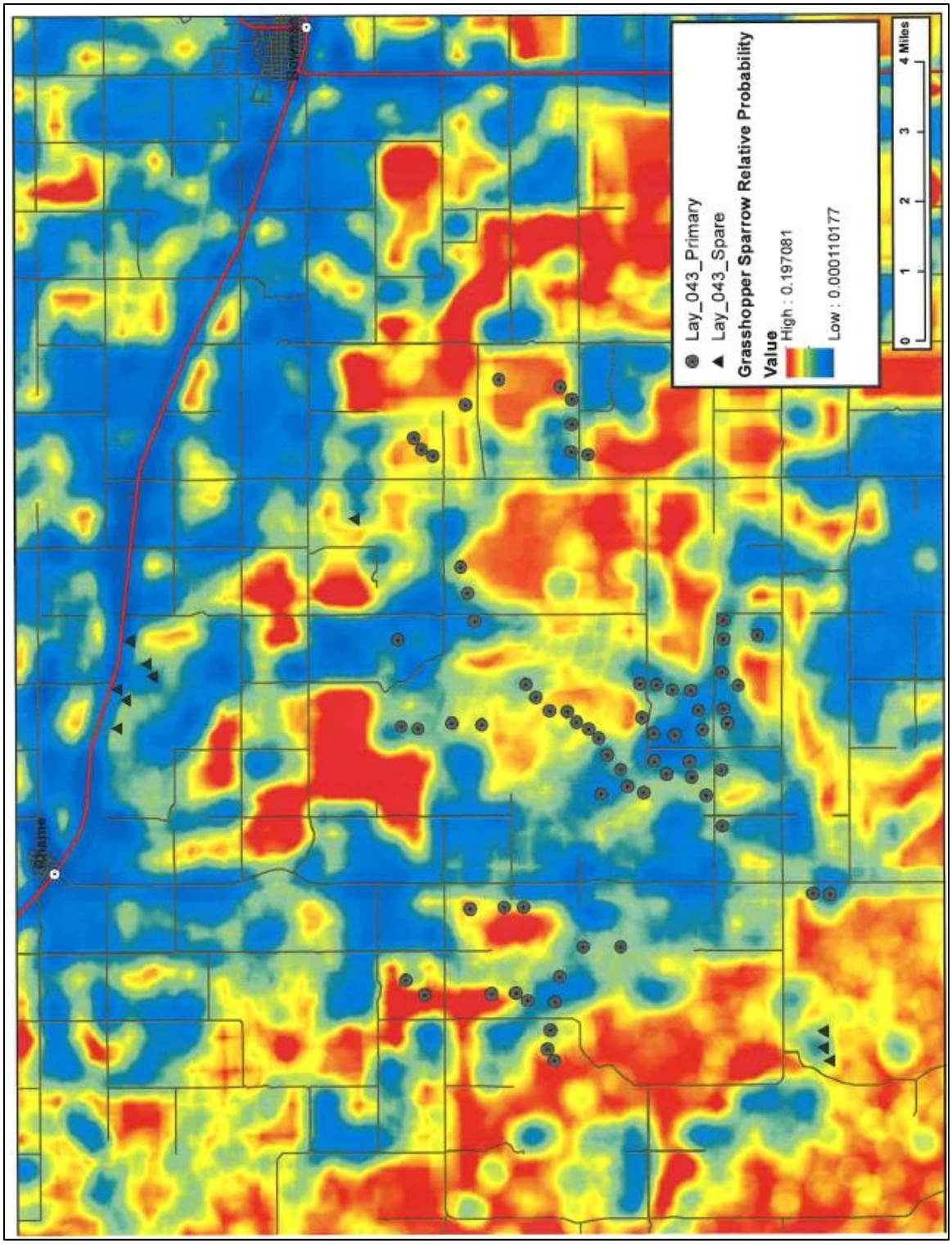
Map B


Lay_043_Primary
Lay_043_Spare
Chestnut-collared Longspur RelProb
Value
High : 0.156813
Low : 1.3864e-08
0
1
2
3
4 Miles

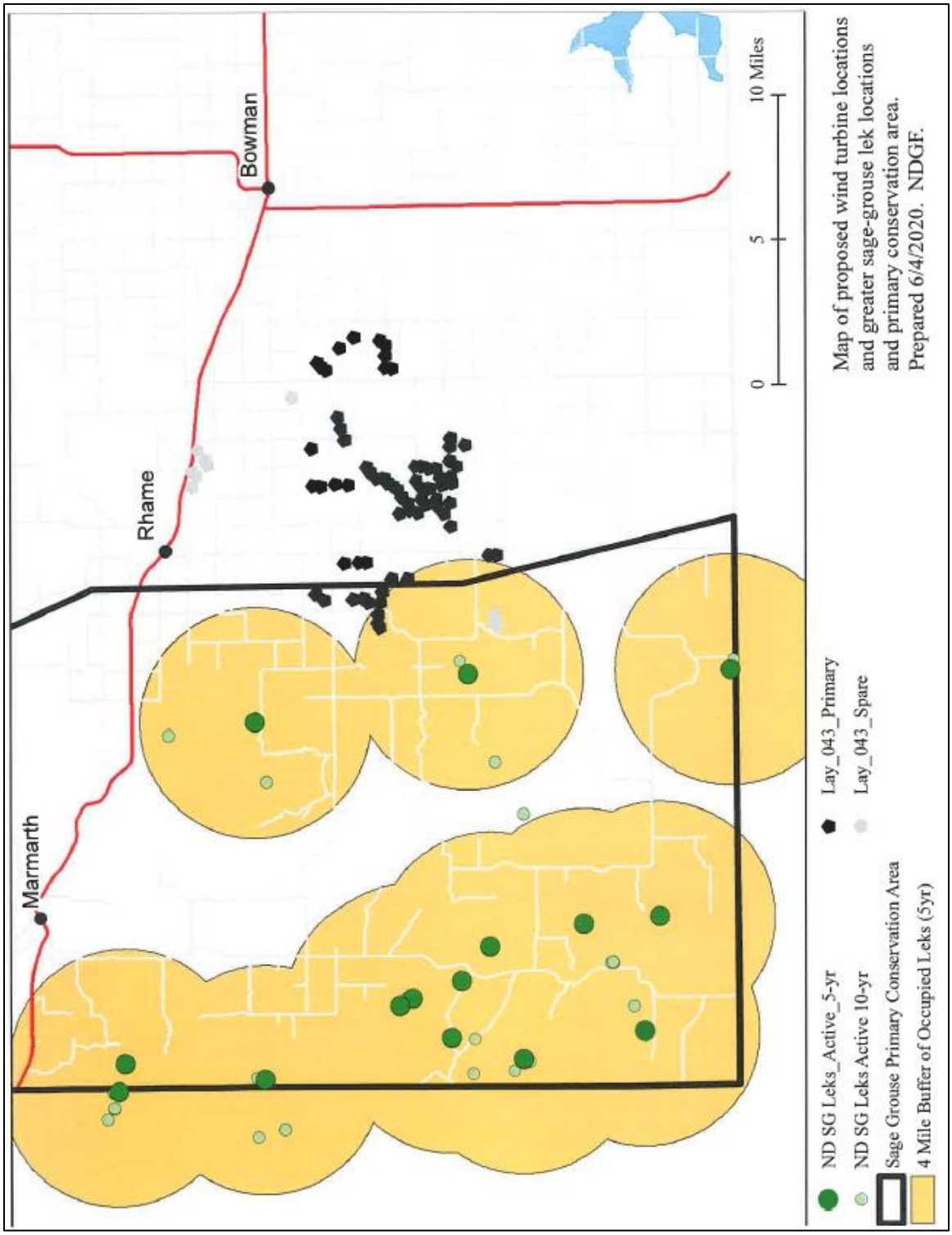
Map C


Bowman
Lay_043_Primary
Lay_043_Spare
Lark Bunting Relative Probability
Value
High : 0.0726386
Low : 9.77922e-06
0
1
2
3
4 Miles

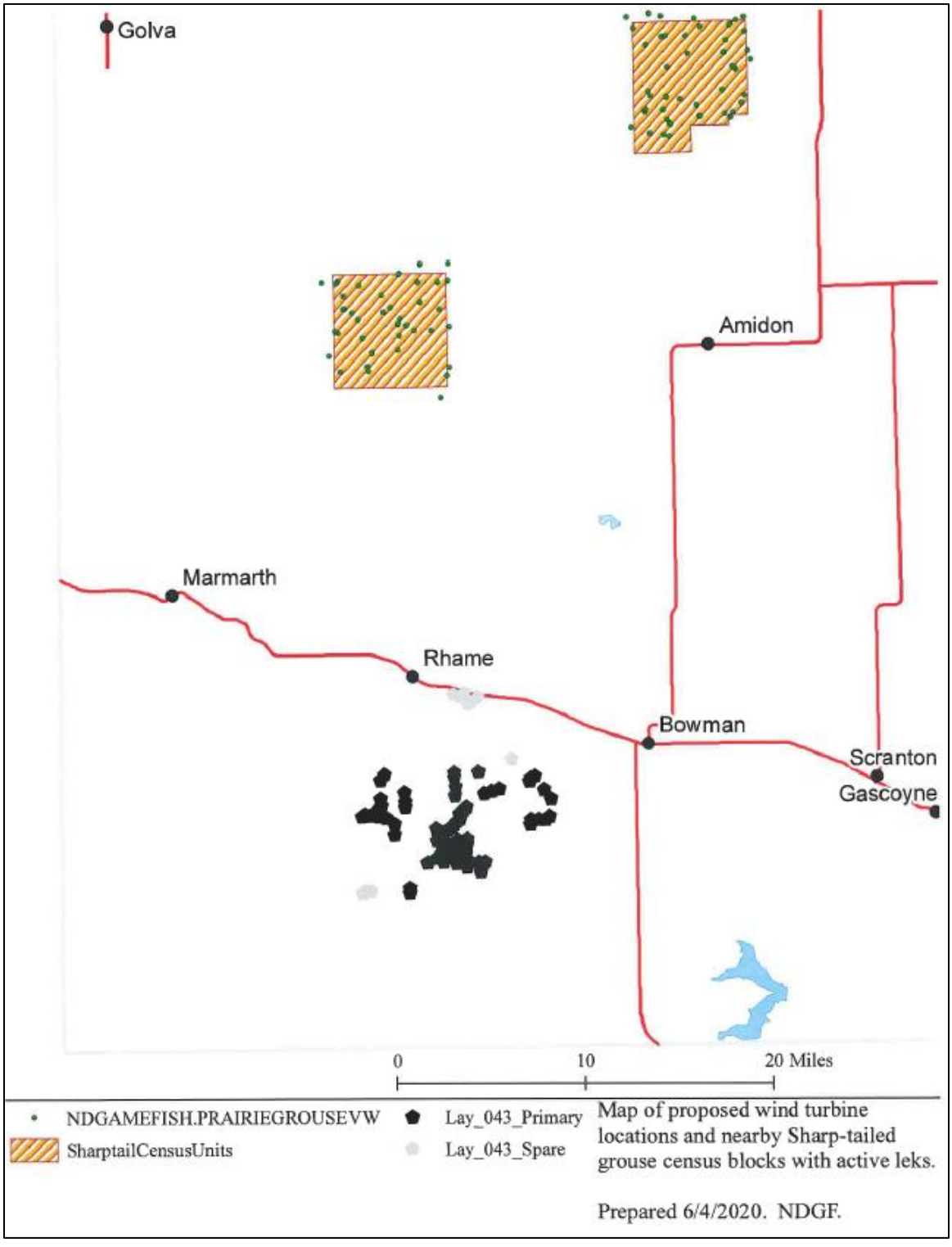
Map D


Lay_043_Primary
Lay_043_Spare
Grasshopper Sparrow Relative Probability
Value
High : 0.197081
Low : 0.000110177
0
1
2
3
4 Miles
Rhame

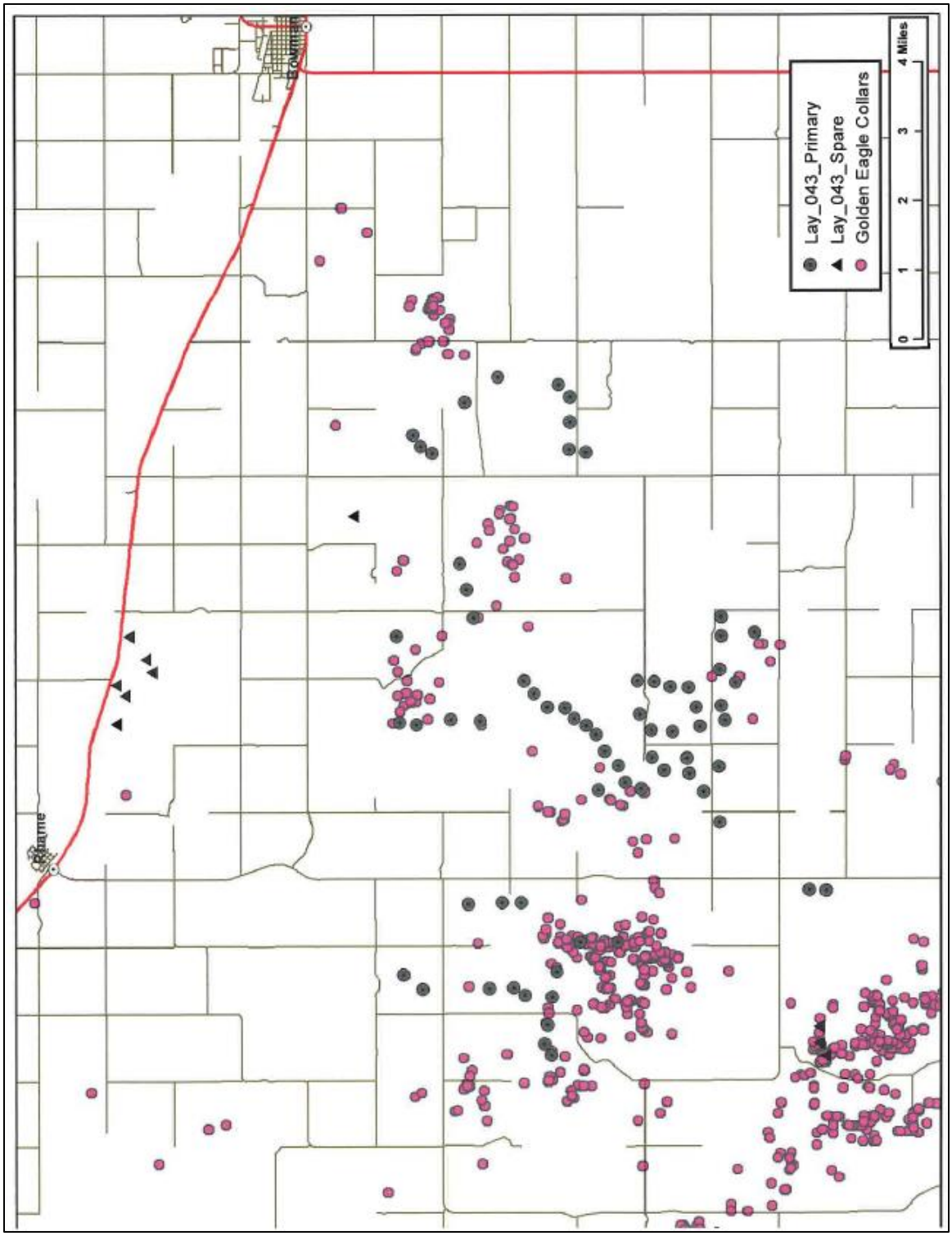
Map E


Marmarth
Rhame
Bowman
0
5
10 Miles
Map of proposed wind turbine locations and greater sage-grouse lek locations and primary conservation area. Prepared 6/4/2020. NDGF.
ND SG Leks_Active_5-yr
ND SG Leks Active 10-yr
Sage Grouse Primary Conservation Area
4 Mile Buffer of Occupied Leks (5yr)
Lay_043_Primary
Lay_043_Spare

Map F


Golva
Amidon
Marmarth
Rhame
Bowman
Scranton
Gascoyne
0
10
20 Miles
NDGAMEFISH.PRAIRIEGROUSEVW
SharptailCensusUnits
Lay_043_Primary
Lay_043_Spare
Map of proposed wind turbine locations and nearby Sharp-tailed grouse census blocks with active leks.
Prepared 6/4/2020. NDGF.

Map G


Bowman
Rhame
Lay_043_Primary
Lay_043_Spare
Golden Eagle Collars
0
1
2
3
4 Miles

Attachment B – March 22nd email from Apex

Hi Elisha,

Thanks for your email. We thought it would be beneficial to provide detailed written responses to your three comments:

1. Turbines 3, 11, 16, 77, and 37 from layout 59 (no turbine number was attached to that data set, so these are the field IDs… hopefully that makes sense). We have identified these turbines as being on native prairie.

A grassland assessment was conducted to identify unbroken native prairie or previously broken grasslands to help inform siting within the proposed development areas of the Bowman Wind Project (Project). Unbroken native prairie was defined as grassland in its original or natural state showing no evidence of soil disturbance, with a dominance of native plant species present (i.e., western wheatgrass, big bluestem, sideoats grama, purple coneflower, blanket flower, etc.). Previously broken grasslands were identified based on features such as rock piles; presence, amount, and apparent height of trees and shrubs; field edge changes; straight line features indicating plowing, disking, harvesting, or planting; non-native plant species present (i.e., smooth brome, alfalfa, etc.), and any other features indicating human disturbance.

The 2020 native prairie/grassland assessment was a three-step process that included interviewing landowners, a desktop review, and a field assessment of grassland parcels within a 400-meter buffer of proposed turbines (Assessment Area). The desktop review included a review of current publicly available datasets (i.e., aerial photography, landowner input, Crop Data Layer 2019, SWCA data from the 2018 assessment, existing land cover data, etc.) and NDGFD Native Habitat Layer. All grassland parcels were digitized using ESRI software (ArcGIS 10.7). During the field assessment, grasslands within the Assessment Areas were visually evaluated on foot where access was permitted or from public roads to confirm the native prairie state (e.g., broken or previously broken).

Based on the native prairie/grassland assessment, turbines with FIDs 3, 11, 16, 37, and 77 (Figure 1) were located in areas identified as previously broken grasslands for the following reasons:

- Grasslands within the Assessment Area of turbines FID 3, 11, and 37 were identified as broken based on the NDGF Native layer, historic aerial imagery (1957-1962) that showed evidence of tillage, and results of the field assessment which indicated the presence of rock piles, vegetation in straight lines, and dominance of non-native planted species (i.e., smooth brome grass and alfalfa), which all indicate previous tillage.
- Grassland within the Assessment Area of turbine FID 16 were identified as broken based on not occurring within the NDGF Native layer, recent aerial imagery that indicated disturbance and degradation in 2019 and 2020, landowner confirmation, and results of the field assessment which indicated the presence of rock piles, vegetation in straight lines, and dominance of non-native planted species (i.e., smooth brome and Poa spp. grasses), which all indicate past tillage.
- Grassland within the Assessment Area of the turbine FID 77 was identified as broken based on not occurring within the NDGF Native layer and historic aerial imagery that showed evidence of tillage (1957 -1962).

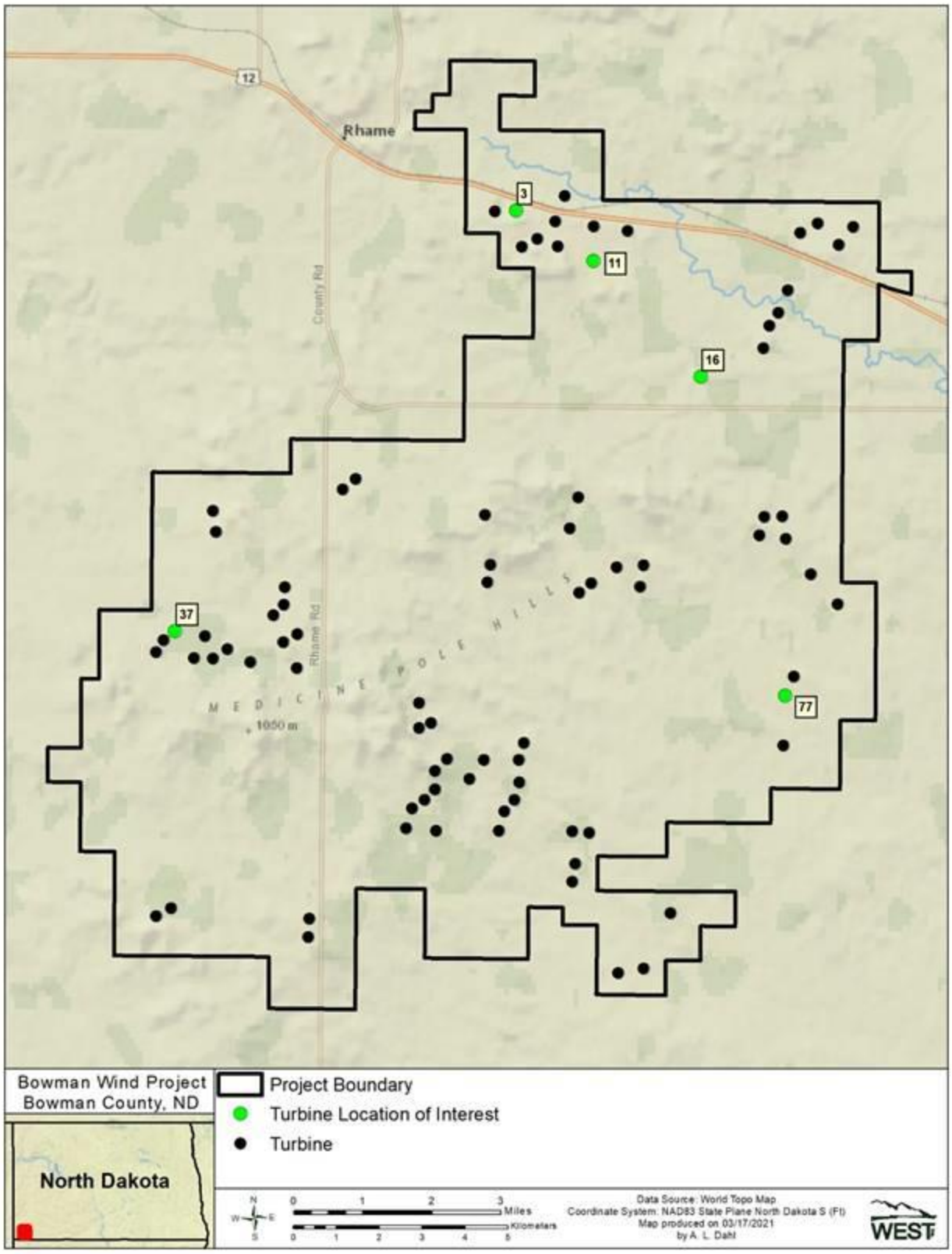


Figure 1 - Turbine locations associated with FIDs 3, 11, 16, 37, and 77

2. Turbines 67, 68, 69, 70, 37, 38, 39, 41, 42, 43, and 44. All of these turbines are within our Greater Sage-grouse Priority Conservation Area and the 6 bolded turbines fall within 4 miles of an active lek. In our early guidance letter (attached for reference), the Department stated that its first recommendation is to discontinue permitting energy development within this area.

Throughout its development of the Bowman Wind Project (Project), Bowman Wind has been cognizant of the NDGF's concerns regarding potential impacts to greater sage-grouse populations in North Dakota, and has taken those concerns into account in Project siting. Bowman Wind reviewed the North Dakota Sage-Grouse Management Plan (Robinson 2014), which identifies three objectives: 1) conserving sagebrush habitats and habitats important for nesting and brood-rearing within Priority Conservation Areas (PCA), 2) increasing connectivity between available habitats in PCA, and 3) protecting intact PCA from fragmentation (Robinson 2014). The North Dakota Sage-Grouse Management Plan identifies various strategies and conservation actions to minimize impacts of specific anthropogenic structures to sage-grouse and their habitats. However, due to the lack of information available at the time of the publication in 2014, no strategies or conservation actions were presented for wind energy development (Robinson 2014).

As a result, Bowman Wind analyzed other State-specific documentation to identify appropriate measures to avoid and/or minimize potential impacts to sage grouse. The State Wildlife Action Plan states that conservation efforts should focus on leks and areas within 2 mile (mi; 3.2 kilometer [km]) of leks (Dyke et al. 2015). Data on sage-grouse monitoring in North Dakota indicates that areas within 2 miles of a lek are important for breeding and nesting, as 68% of all nests were located within 2 miles of a lek (average 1.7 mi [2. 7 km]; Herman-Brunson 2007, Herman-Brunson et al. 2009).

Bowman Wind also reviewed the limited research available specific to the effects of wind energy on sage-grouse populations. To date, one published study has analyzed the potential effects of wind energy infrastructure on sage-grouse at a single facility/study area. That study indicated that wind energy infrastructure sited within 0.75 mi (1.2 km) of important brood-rearing and late summer habitats could displace sage-grouse that are using those habitats; however, this displacement was found to not negatively affect survival (LeBeau et al. 2017a). In that same study area, trends in males attending leks pre-development compared to post-development of a wind energy facility did not differ, suggesting the presence of the facility did not result in population level declines (LeBeau et al. 2017a, LeBeau et al. 2017b). Leks in that study area where the facility was located ranged from 0.31 mi (0.5 km) to 2.7 mi (4.3 km) to the nearest turbines; however, given the results were associated with one facility/study area, the authors cautioned any avoidance buffers < 0.93 mi (1.5 km; LeBeau et al. 2017b).

Given the limited amount of research of the effects of wind energy on sage-grouse populations, Bowman Wind also considered research on the effects of wind energy development on other grouse populations, given their similar life histories. Based on the 15 published studies that have evaluated the impacts of wind energy on grouse, we understand that wind energy infrastructure has the ability to adversely affect grouse behavior similar to other forms of development, but the magnitude of effects associated with wind energy appears to be less than other forms of energy development (Winder et al. 2014, LeBeau et al. 2017a, 2020a,b). For example, in Idaho, Columbian sharp-tailed grouse (CSTG; Tympanuchus phasianellus columbianus) nest survival and nest site selection were not influenced by proximity to turbines (Proett et al. 2019). Likewise, greater prairie chicken (GRPC; T. cupido) nest and

female survival was also reportedly not influenced by proximity to wind turbines in Nebraska or Kansas (Winder et al. 2014, McNew et al. 2014, Harrison et al. 2017, Smith et al. 2017). This is in contrast to the effects of oil and gas development on sage-grouse breeding populations (e.g., Holloran and Anderson 2005, Aldridge and Boyce 2007, Kirol et al. 2020).

A review of North Dakota oil and gas well data shows that ten active wells appear to occur within 2 miles of the previous active sage-grouse lek. Therefore, one of the most disruptive energy developments has already occurred in close proximity to this lek. Comparatively, of the limited Project infrastructure proposed to be located within the PCA, all of the infrastructure is located on the very eastern edge of the PCA boundary, and greater than 2 miles from the active sage-grouse lek. More importantly, the infrastructure was sited in areas with existing disturbances including cultivated croplands and roads, so impacts have previously occurred within these disturbed areas. Further, Project infrastructure located in the PCA is not likely to impact the sage-grouse population given the previous disturbances to this area, active oil and gas wells within 2 miles of the active lek, placement of the proposed infrastructure in previously disturbed areas, and our current understanding of effects of wind energy development on grouse populations. As noted above, grouse monitoring studies in North Dakota suggest placing infrastructure 2 miles away from an active lek will minimize impacts to breeding and nesting sage-grouse (Herman-Brunson 2007, Herman-Brunson et al. 2009). In addition, based on the best available science for grouse, impacts from wind energy development are not expected to extend beyond one mile from infrastructure. Therefore, Bowman Wind's placement of infrastructure in areas with existing fragmentation and at least 2 miles from leks is not expected to impact the local sage-grouse population (LeBeau et al. 2017a,b; see LeBeau et al. 2020a). Connectivity between habitats is also not expected to be impacted given that the infrastructure located within the PCA is in the eastern-most extent and in areas with existing fragmentation, so affects to the local sage-grouse population and their habitats (if any) have already occurred. Considering all of the information outlined above, Bowman Wind believes it has sited Project infrastructure to avoid and minimize potential impacts to any local, remnant sage-grouse populations.

Aldridge, C. L. and M. S. Boyce. 2007. Linking Occurrence and Fitness to Persistence: A Habitat-Based Approach for Endangered Greater Sage-Grouse. Ecological Applications 17: 508-526.

Dyke, S. R., S. K. Johnson, P. T. Isakson. 2015. North Dakota State Wildlife Action Plan. North Dakota Game and Fish Department, Bismarck, ND.

Harrison J. O., M. B. Brown. L. A. Powell, W. H. Schacht, and J. A. Smith. 2017. Nest site selection and nest survival of greater prairie-chickens near a wind energy facility. The Condor 119:659-672.

Herman-Brunson, M. 2007. Nesting and brood-rearing habitat selection of greater sage-grouse and associated survival of hens and broods at the edge of their historic distribution. Thesis South Dakota State University.

Herman-Brunson K. M, K. C. Jenson, N. W. Kaczor, C. C. Swanson, M. A. Rumble, and R. W. Klaver. 2009. Nesting ecology of greater sage-grouse Centrocercus urophasianus at the eastern edge of their historic

distribution. Journal of Wildlife Biology 15: 395-404.

Holloran, M. J. and S. H. Anderson. 2005. Spatial Distribution of Greater Sage-Grouse Nests in Relatively Contiguous Sagebrush Habitats. Condor 107: 742-752.

Kirol, C.P., K.T. Smith, N.E. Graff, J.B. Dinkins, C.W. LeBeau, T.L. Maechtle, A.L. Sutphin, and J.L. Beck. 2020. Greater sage-grouse response to the physical footprint of energy development. Journal of Wildlife Management 84:989–1001.

LeBeau, C. W., G. D. Johnson, M. J. Holloran, J. L. Beck, R. M. Nielson, M. E. Kauffman, E. J. Rodemaker, and T. L. McDonald. 2017a. Greater Sage-Grouse Habitat Selection, Survival, and Wind Energy Infrastructure. Journal of Wildlife Management 81(4): 690-711. doi: 10.1002/jwmg.21231

LeBeau, C. W., J. L. Beck, G. D. Johnson, R. M. Nielson, M. J. Holloran, K. G. Gerow, and T. L. McDonald. 2017b. Greater Sage-Grouse Male Lek Counts Relative to a Wind Energy Development. Wildlife Society Bulletin 41(1): 17-26. doi: 10.1002/wsb.725.

LeBeau, C., S. Howlin, A. Tredennick, and K. Kosciuch. 2020b. Grouse Behavioral Response to Wind Energy Turbines: A Quantitative Review of Survival, Habitat Selection, and Lek Attendance. Prepared for the National Wind Coordinating Collaborative, Washington, D.C. Prepared by Western EcoSystems Technology, Inc. (WEST).

LeBeau, C., K. Smith, S. Howlin, M. Kauffman, A. Tredennick, and K. Kosciuch. 2020b. A quantitative review of grouse responses to conventional and renewable energy infrastructure. Ecosphere. In review.

McNew, J. B., J. M. Hunt, A. J. Gregory, S .M. Wisely, and B .K. Sandercock. 2014. Effects of wind energy development on nesting ecology of greater prairie-chickens in fragmented grasslands. Conservation Biology 28:1089–1099.

Proett, M., S. B. Roberts, J. S. Horne, D. N. Koons, and T. A. Messmer. 2019. Columbian Sharp-Tailed Grouse Nesting Ecology: Wind Energy and Habitat. Journal of Wildlife Management: doi: 10.1002/jwmg.21673.

Robinson A. C. 2014. Management Plan and Conservation Strategies for Greater Sage-Grouse in North Dakota. North Dakota Game and Fish Department. Bismarck, ND, USA.

Smith J. A., M. B. Brown, J. O. Harrison, L. A. Powell. 2017. Predation risk: a potential mechanism for effects of a wind energy facility on greater prairie-chicken survival. Ecosphere 8(6):e01835.

Winder, V., L. B. McNew, L. M. Hunt, A. J. Gregory, S. M. Wisely, and B. K. Sandercock. 2014. Effects of Wind Energy Development on Seasonal Survival of Greater Prairie-Chickens. Journal of Applied Ecology 51: 395-405.

3.The most recent impact analysis and voluntary offset package. We have not seen an updated one and are assuming it is the same as the original, but if this isn't the case, could you provide that prior to our meeting?

Bowman Wind committed to apply the NDGFD's recommended overarching policy of avoidance, minimization, restoration, and mitigation to unbroken grasslands as part of the siting of wind turbines associated with the Project. NDGFD recommended the potential application of the Shaffer et al. 2019 (Estimating offsets for avian displacement effects of anthropogenic impacts) model as a tool to calculate voluntary offsets associated with turbines and potential grassland nesting bird displacement. As previously discussed, Bowman Wind planned to calculate voluntary offsets based on Shaffer et al. 2019 with the WEST grassland data layer (that includes landowner historical knowledge, historical and recent aerial and satellite photography review, and field verification) incorporated as the best-available grassland data. Below are the calculations of voluntary offsets that have been incorporated into the Bird Bat Conservation Strategy (BBCS) for Layout 059, which is the final layout being submitted to the ND PSC for approval.

Final Layout 059 Grassland Mapping Updated Based on WEST Field Assessment Used for the Avian-impact Offset Method to Estimate Offsets for Displaced Breeding Grassland Birds *{RESULTS IN THIS TABLE INCLUDE 85 TOTAL PRIMARY AND SPARE TURBINE LOCATIONS – >THE FINAL PROJECT LAYOUT WILL TOTAL 74, 2.82 MW TURBINE LOCATIONS}

Parameter	Metric	Units	Source
Impact Distance	300	m	Shaffer and Buhl (2016)
Impact Area	537	ha	Derived from WEST Grassland Assessment
Pre-Impact Density	1.9	pairs/ha	Shaffer and Buhl (2016)
Percent Displacement	53	percent	Shaffer et al. (2019)
Offset Density	1.9	pairs/ha	Equal Value Habitat
Number Pairs in Impact Site	1020	pairs	--
Number Pairs Displaced	540	pairs	--
Offset Area	284	ha	--

Note: This table was replicated from Shaffer et al (2019) Appendix S1, Table S3, Example 2 calculation sheet

Bowman Wind committed to following one of the key "averted-loss" tenets of Shaffer et al. 2019 peer-reviewed paper, which is to offset indirect displacement of grassland birds by protecting existing native landscapes or other valuable habitat through voluntary easements. Consistent with this commitment, Bowman Wind plans to acquire unbroken grassland conservation easements for the life of the Project as a voluntary offset for displaced grassland breeding birds by incorporation of the outputs from the framework model calculations in the table above and as detailed in Shaffer et al. 2019.

Shaffer, J. A., and D. A. Buhl. 2016. Effects of wind-energy facilities on grassland bird distributions. Conservation Biology 30:59–71.

Shaffer, J. A., C. R. Loesch, and D. A. Buhl. 2019. Estimating offsets for avian displacement effects of anthropogenic impacts. Ecological Applications.

Thanks for all of your coordination and discussions. As an update, the Project plans to submit its application to the North Dakota Public Service Commission this week.

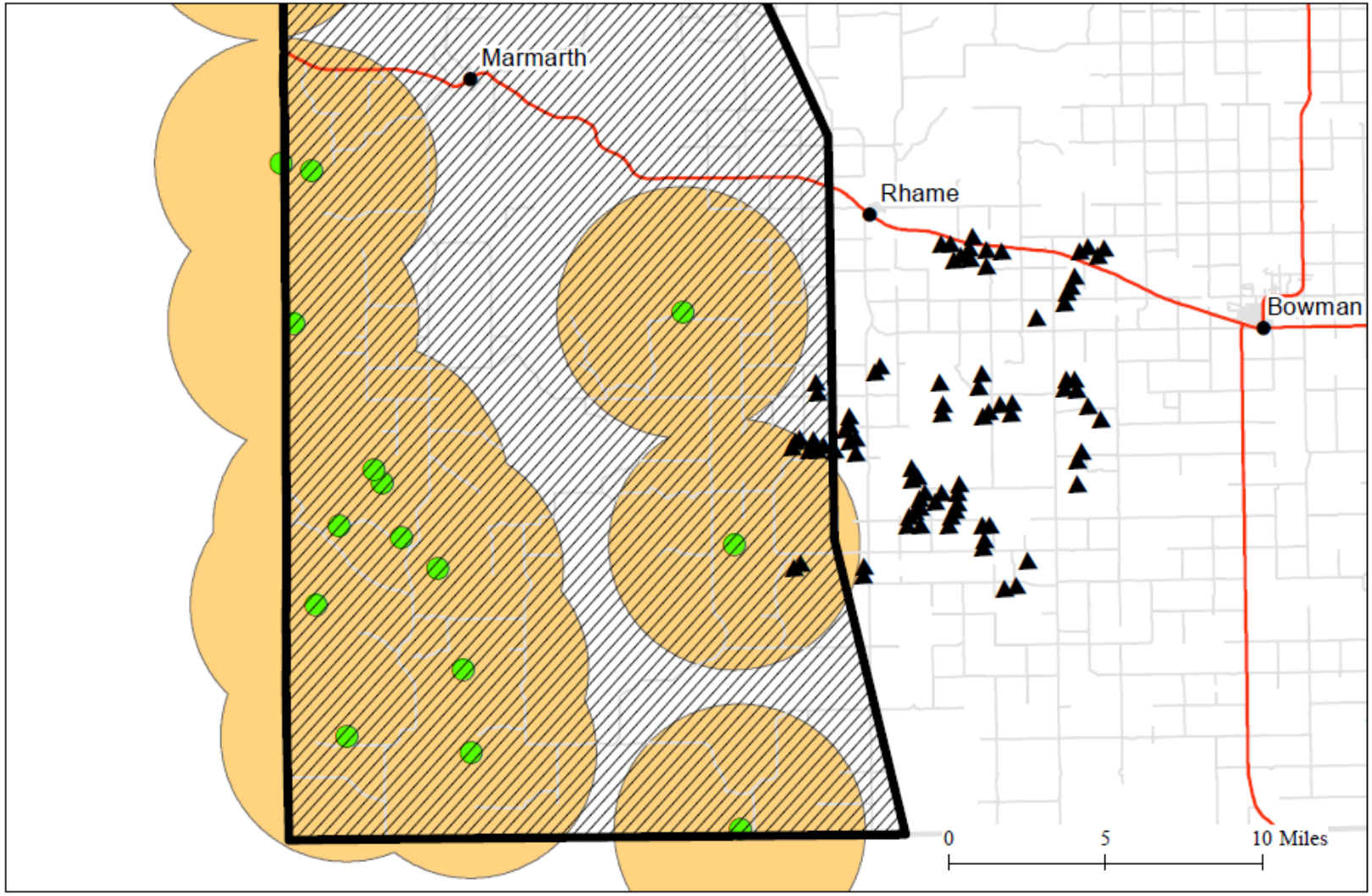
Regards,

-Ryan

RYAN HENNING

Apex Clean Energy, Inc.

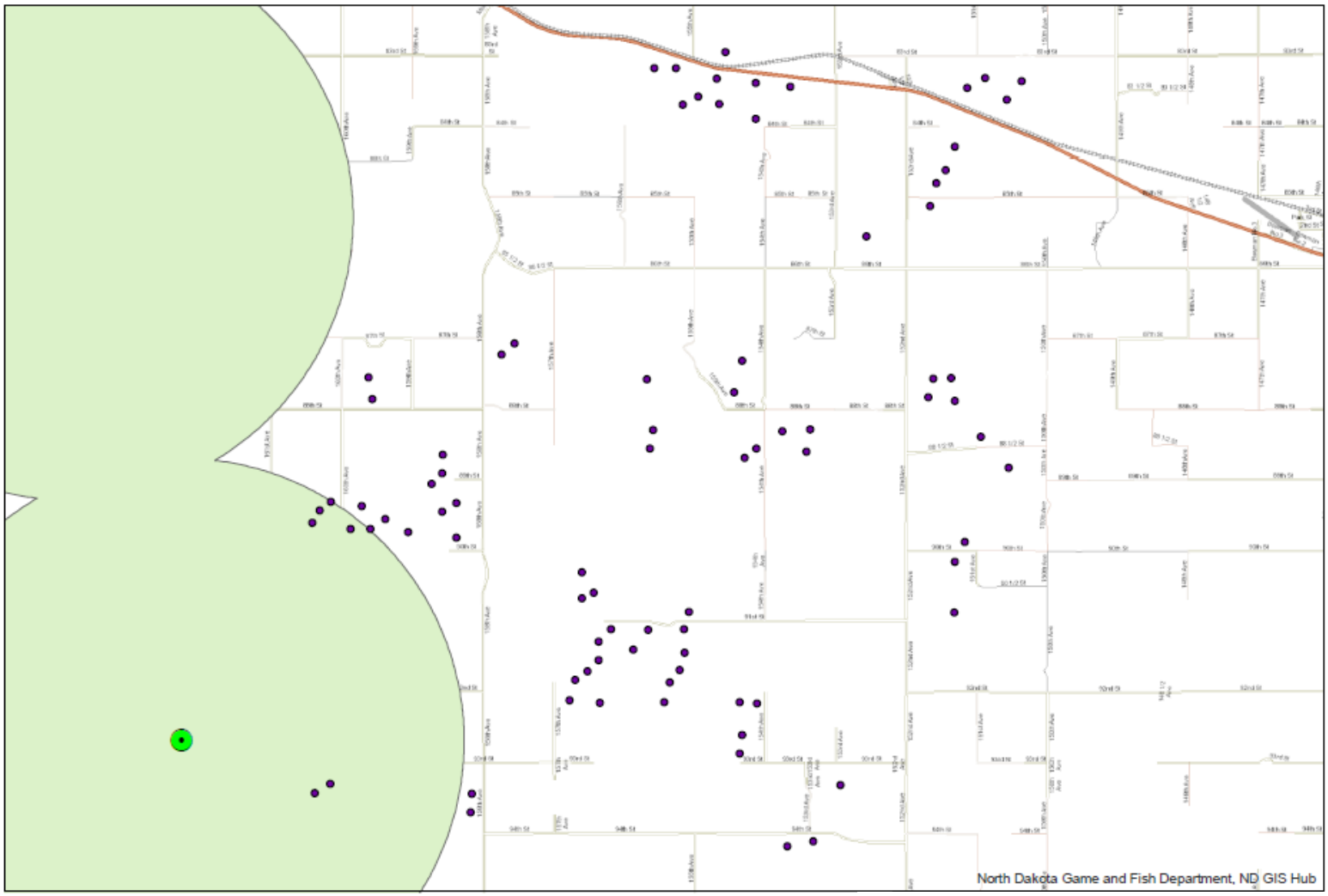
Attachment C – Turbines and Greater sage-grouse PCA



Sage Grouse Primary Conservation Area
LAY_059_Turbines
ND SG Leks_Active_5-yr
4 Mile Buffer of Occupied Leks (5yr)

Map of proposed wind turbine locations and greater sage-grouse primary conservation area.
Prepared 03/09/2021. NDGF.

Attachment D – Turbines and Greater sage-grouse active leks



LAY_059_Turbines

Sage-grouse Leks (active 2020)

2020_4milebuffer_ocupied leks_5yr