Appendix A: Public Involvement Information

Department of Energy
Western Area Power Administration
Upper Great Plains Customer Service Region
P.O. Box 35800
Billings, MT 59107-5800

B0401.BL

NOV 19 2018

Dear Customers and Interested Parties:

This letter is to notify you of the proposed Lookout Solar Project (Project) and to request your input on the Project. The Project would involve construction of an 840-acre photovoltaic solar generating facility. Other project components would include a new substation, a new underground transmission line, access roads, and a maintenance and operation center. The Project would be located approximately 22 miles south of Buffalo Gap, primarily on lands within the Pine Ridge Indian Reservation in Oglala Lakota and Custer Counties, South Dakota (see enclosed map).

The Project would interconnect with Western Area Power Administration's (WAPA) New Underwood to Wayside 230-kilovolt Transmission Line. As a result, WAPA will provide federal oversight of the preparation of an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA). The EA will evaluate the environmental effects of the proposed Project on resources such as wetlands, vegetation and wildlife, cultural and recreation resources, as well as other social, economic, and environmental effects.

WAPA is announcing a public scoping period for the Project. The scoping period provides an opportunity for the general public, government agencies, and tribal governments to identify issues and alternatives that will help WAPA define the scope of the EA. One public scoping meeting (open house format) will be held to provide an opportunity for interested parties to discuss the Project with resource specialists and to submit comments. The meeting will be held on Wednesday, December 5th, 2018, from 5:00 p.m. to 7:00 p.m., at the Hot Springs Public Library.

Comments may be submitted in the following ways:

- By mail to:
  Western Area Power Administration
  Attn: Ms. Christina Gomer
  2900 4th Avenue North
  Billings, MT 59101
- By fax to (406) 255-2900
- By email to gomer@wapa.gov
- In writing at the public scoping open house meeting:
  Wednesday, December 5th, 2018
  5:00 p.m. to 7:00 p.m.
  Hot Springs Public Library
  2005 Library Drive
  Hot Springs, South Dakota 57747

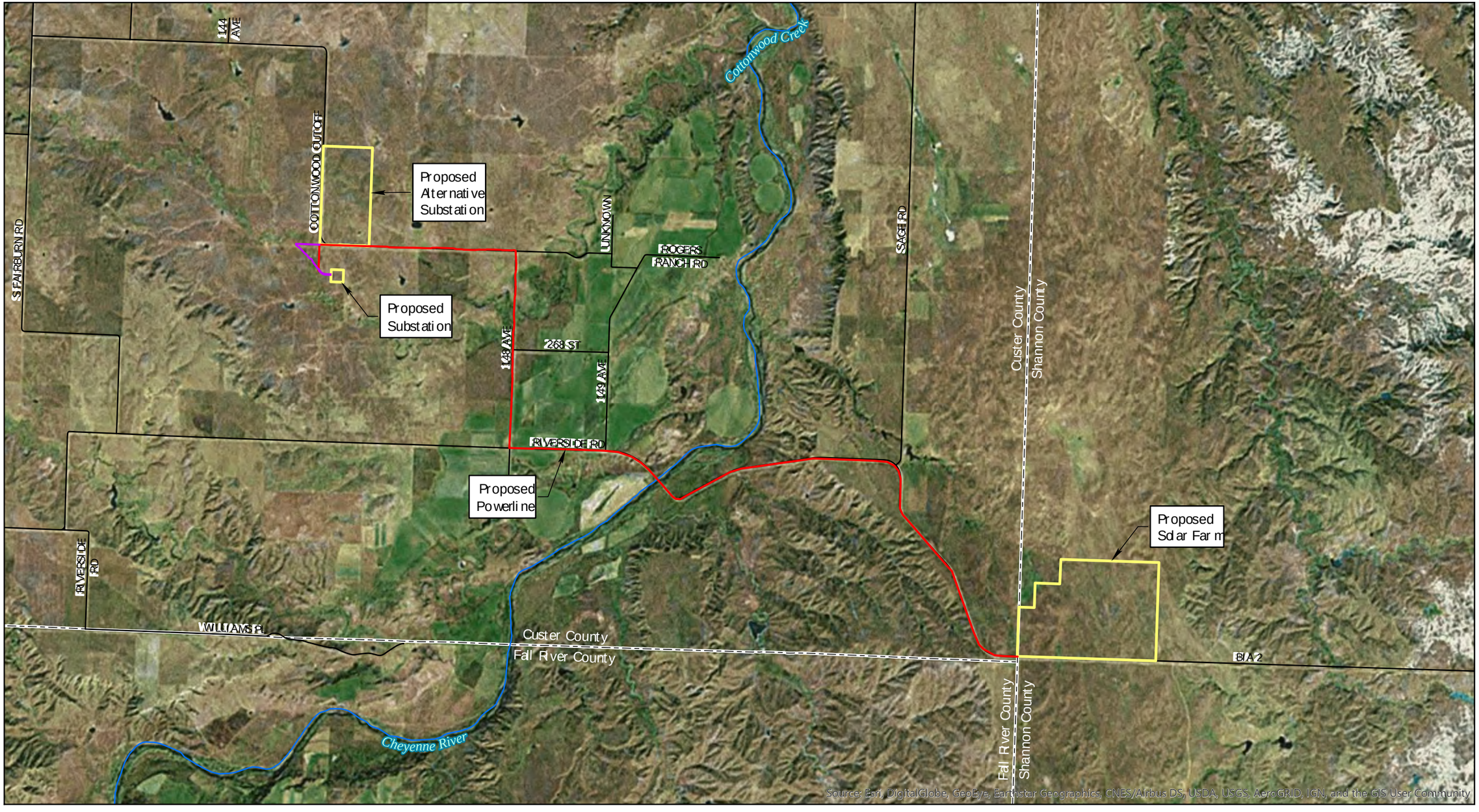
For your input to be considered during preparation of the draft EA, WAPA requests comments by Monday, January 7, 2019. If you have any questions, or need more information about the project, please contact WAPA using the methods listed above. Thank you for your time and interest in the Project.

Sincerely,

Christina Gomer

Christina Gomer
NEPA Coordinator

Enclosure



EXPLANATION

- POWERLINE
- PROPOSED ACCESS ROAD
- PROPERTY BOUNDARIES

N

0 1 Miles

Trihydro Corporation
152 Commerce Drive
Laramie, WY 82070
www.trihydro.com
(P) 307.745.7474 (F) 307/745.7729

DRAFT

FIGURE 3

PROJECT OVERVIEW

LOOKOUT SOLAR PARK I, LLC
CUSTER COUNTY, SOUTH DAKOTA

Drawn By: BR	Checked By: ES	Scale: 1" = 1 Mile	Date: 12/20/17	File: Lookout_Solar_Park.aprx

\\TRIHYDRO.COM\FILESTORE\PROPOSAL\BUREAU OF INDIAN AFFAIRS - GREAT PLAINS RO\999-512-001\DRAFT\SWETLANDS\GIS\LOOKOUT_SOLAR_PARK\LOOKOUT_SOLAR_PARK.APRX

Letter Number	Comment Number	Entity	Date of Comment	Comment	Response	Comment Topic
Scoping						
A	1	Private Citizen	12/5/2018	Appears Lookout Solar is a foreign owned company. The foreign ownership could leave local entities holding the liabilities, if this project encounters difficulties.	Comment noted.	General Economic
A	2	Private Citizen	12/5/2018	Custer County Commission has already issued a Occupancy on Right-of-Way to Lookout Alternative Energy, LLC 3-8-2017 for the same route proposed by Lookout Solar.	Comment noted. WAPA's interconnection decision is separate from any other permissions the Project may need to acquire, such as approval from State or local	General
A	3	Private Citizen	12/5/2018	Past wind farm project in this same area was handled very poorly by Custer County Commission, causing grave concerns about how they may handle this Project.	Comment noted. WAPA's authority on the project is limited to the Federal action of approving or denying the interconnection.	General
B	1	U.S. Department of Agriculture, Farm Service Agency	11/26/2018	Thank you for the opportunity to comment on the project information involving the proposed construction of the Lookout Solar Project located in Oglala Lakota and Custer Counties in South Dakota. As a Federal nexus, the Farm Service Agency (FSA) is requesting more detail of the project area in order to determine if any of our producers may be affected. If there is a shapefile that you would be able to share with us, we can make a determination of what interested we have in the project prior to the completion of your EA.	WAPA responded via email on 1/3/19 with the following response: Attached are the Project shapefiles. Please let me know if there is anything else I can do.	Land Use Vegetation
C	1	U.S. Department of Agriculture, Natural Resources Conservation Service	12/27/2018	Thank you for the opportunity to provide Farmland Protection Policy Act (FPPA) review of this project. The project as outlined will have no impact on prime or important farmland. The Natural Resources Conservation Service (NRCS) would advise the applicant to consult with the local NRCS and Farm Service Agency offices regarding any United States Department of Agriculture easements or contracts in the project areas that may be affected. For any other easements outside of the NRCS, you should check with the local courthouses.	Comment noted.	Land Use Vegetation
D	1	South Dakota Department of Environment and Natural Resources	12/17/2018	The South Dakota Department of Environment and Natural Resources (DENR) Surface Water Quality Program has reviewed the proposed Lookout Solar Project in Oglala Lakota and Custer Counties. The DENR finds that this construction, using conventional construction techniques, should not cause violation of any statutes or regulations administered by the DENR based on the following comments: 1. At a minimum and regardless of project size, appropriate erosion and sediment control measures must be installed to control the discharge of pollutants from the construction site. Any construction activity that disturbs an area of one or more acres of land must have authorization under the General Permit for Storm Water Discharges Associated with Construction Activities. Contact the Department of Environment and Natural Resources for additional information or guidance at 1-800-SDSTORM (800-737-8676) or http://denr.sd.gov/des/sw/StormWaterandConstruction.aspx. 2. A Surface Water Discharge (SWD) permit may be required if any construction dewatering should occur as a result of this project. Please contact this office for more information. 3. Impacts to tributaries and wetlands should be avoided or minimized if possible. These water bodies are considered waters of the state and are protected under the South Dakota Surface Water Quality Standards. The discharge of pollutants from any source, including indiscriminate use of fill material, may not cause destruction or impairment except where authorized under Section 404 of the Federal Water Pollution Control Act. Please contact the U.S. Army Corps of Engineers concerning these permits. This office requests the opportunity to review and comment on any significant changes that may be proposed before the project is completed. Thank you for the opportunity to comment on the proposed project.	Comment noted.	Water Resources
E	1	South Dakota Game, Fish and Parks	12/26/2018	I received a WAPA scoping notice for the proposed solar project on the Pine Ridge Indian Reservation in South Dakota. I have been going through the information you sent, and some of the information that has been submitted to the South Dakota Public Utilities Commission for the permit for this solar facility. I have a couple questions for you: 1. Do you have any shape files that you might be able to share with more specific project boundaries? 2. In the PUC application, it looks like there was an Environmental Assessment completed in Summer 2016 for the proposed project. This was completed by the Bureau of Indian Affairs, and they issued a FONSI. Why is there a second EA being conducted for this project? 3. What was the reasoning for the extended deadline in the scoping notice?	WAPA provided the following response on 12/27/18: Thank you for your interest in the project. To answer your questions: 1. Do you have any shape files that you might be able to share with more specific project boundaries? Yes. Please see attached. 2. In the PUC application, it looks like there was an Environmental Assessment completed in Summer 2016 for the proposed project. This was completed by the Bureau of Indian Affairs, and they issued a FONSI. Why is there a second EA being conducted for this project? The BIA's EA did not fully describe the Proposed Action. The BIA document only covered the portions of the project which are to be located on the Pine Ridge Reservation. The transmission line and WAPA's federal action (to allow the interconnection) was not described in the BIA's EA. Also, the Forest Service may have a Federal action (issuing an easement or special use permit), which was not described in the BIA's document. The BIA does not intend to amend or modify their 2016 EA, so WAPA and the Forest Service are preparing a second EA to fully evaluate the project and our respective Federal actions. 3. What was the reasoning for the extended deadline in the scoping notice? President Trump directed all Federal agencies to close for business on Wednesday, December 5th, as a day of mourning for the late President Bush. As such, neither WAPA or Forest Service representatives were able to attend the December 5th public meeting. WAPA	General
E	2	South Dakota Game, Fish and Parks	2/11/2019	Thank you for contacting the South Dakota Department of Game, Fish and Parks (SDGFP) regarding the above-mentioned project involving the construction of an 840 acre photovoltaic solar generating facility, a new substation, a new underground transmission line, access roads and a maintenance and operation center in Ogalala Lakota and Custer Counties, South Dakota. The scoping notice did not include sufficient detail to determine environmental impacts of this project. However, SDGFP accessed the developers application materials sent to the South Dakota Public Utilities Commission to complete our review. We have	Comment noted.	General

Letter Number	Comment Number	Entity	Date of Comment	Comment	Response	Comment Topic
E	3	South Dakota Game, Fish and Parks	2/11/2019	Siting and operation of solar projects has the potential to directly and indirectly impact area wildlife. This may occur by altering habitats, influencing behavior patterns and directly killing individuals through collisions with project infrastructure. In particular, SDGFP is concerned about collision mortality of birds and bats in the project area (Harrison et al. 2016, Walston et al. 2016). Lookout Solar LLC (the developer) conducted one year of pre-construction wildlife surveys at the project site. If major impacts are predicted from these studies, development in the area should be avoided. If less serious impacts are anticipated, mitigation is recommended to reduce these impacts. Post-construction studies should be conducted to assess actual impacts of the project, evaluate mitigation effectiveness and evaluate predictions. Very little research exists on the impacts of solar energy facilities sited in grassland and herbaceous habitat. We recommend the developer follow the methods described in Huso et al. (2016) for	Comment noted.	Fish and Wildlife
E	4	South Dakota Game, Fish and Parks	2/11/2019	A desktop review of the project indicated that most of the proposed area is classified as grassland/herbaceous cover with a small portion of the area classified as shrub/scrub in the 2011 National Land Cover Database (https://www.mrlc.gov/). The Natural Resources Conservation Service identifies this major land resource area as mixed sandy and silty tableland and badlands. This area is dominated by grasslands and shrublands. Remnant prairie tracts have high conservation value, especially those that contain a high diversity of both plant and animal species, and rare or non-existent invasive species. We acknowledge this area is likely comprised of primarily untilled native grasslands and impacts to these habitats may be unavoidable, but would still recommend the project area be surveyed for untilled tracts of native prairie and recommend efforts taken not to place solar panels, roads, collection lines and facilities in these areas. The project area does contain large areas of un-fragmented land, indicating the potential for high quality wildlife habitat. The EA should provide information on the extent of grassland in the area, ways to avoid direct loss of grassland acres and ways to reduce degradation and fragmentation. Additionally, mixed sandy and silty tablelands and badlands are susceptible to wind and water erosion. South Dakota Game, Fish	Comment noted. These topics are discussed in sections 3.1, 3.4, and 3.5 of the draft EA.	Soils and Geology Vegetation Water Resources
E	5	South Dakota Game, Fish and Parks	2/11/2019	We have conducted a search of the SD Natural Heritage Database (NHD) for the above referenced project. This database monitors species at risk, specifically those species that are legally designated as threatened or endangered or rare. Rare species are those that are declining and restricted to limited habitat or a jurisdiction, may be isolated or disjunct due to geographic or climatic factors that are classified as such due to lack of survey data. A list of monitored species can be found at http://gfp.sd .gov/natural-heritage-program . Many places in South Dakota have not been surveyed for rare or protected species and the absence of a species from the database does not preclude its presence from the project area. If surveys indicate that state endangered, threatened or rare	Comment noted.	General
E	6	South Dakota Game, Fish and Parks	2/11/2019	In North America, grassland birds have experienced consistent and long term declines (Peterjohn and Sauer 1999). The developers included reports of one year of grassland bird studies conducted in the project area. A number of species were documented that are impacted by habitat fragmentation. Species of habitat fragmentation concern are those which research and literature indicate are negatively affected by loss and fragmentation of habitat. Fragmentation includes cutting habitats into smaller, more isolated blocks and the creation of barriers (such as the inclusion of trees in prairies, barren land in forested areas, wind turbines, roads, etc.). The effects of fragmentation on species of concern include avoidance of fragmented areas or decreased density, survival, and/or reproduction in fragmented habitats. This list was compiled by the U.S. Fish and Wildlife Service. The EA should address ways to reduce direct and indirect impacts to these species. Sensitive species present in the project area include: Burrowing owl (Athene cunicularia) Upland Sandpiper (Bartramia longicauda) Longbilled Curlew (Numenius americanus) Western Meadow Lark (Sturnella neglecta) Lark Bunting (Colamospiza melanocorys) Sharp-tailed grouse (Tympanuchus phasianellus) Grasshopper Sparrow (Ammodramus savannarum) Additionally, a search of the NHD indicated that there is a 2011 record of a nesting burrowing owl (Athene cunicularia) located in a prairie dog town in the US Forest Service allotment where the proposed alternate substation is located. The burrowing owl is	Comment noted. The 0.25-mile buffer for Burrow owls has been incorporated in the draft EA in section 3.7.1.	Fish and Wildlife
E	7	South Dakota Game, Fish and Parks	2/11/2019	South Dakota Game, Fish and Parks generally recommends two years of prairie grouse lek surveys in a project area prior to development. Prairie grouse (sharp-tailed grouse and greater prairie chicken (T. cupido)) inhabit large in-tact blocks of native grassland. Development (roads, power lines, solar panels, buildings, etc.) in and around prairie grouse habitat can fragment otherwise suitable habitat and displace birds. Prairie grouse are indicators of high quality grassland habitat and a robust ecological community due to their specific habitat needs. The developers of the Lookout Solar project did not complete prairie grouse lek surveys, but they did observe sharp-tailed grouse in the project area. South Dakota Game, Fish and Parks recommends a 1 mile setback from active sharp-tailed grouse leks. If possible, we recommend performing pre-construction lek surveys in April and May of 2019, and siting of project infrastructure 1 mile from active leks. We also suggest a two mile no construction buffer during the lekking season, 1 March to 30 June. Sharp-tail grouse are sensitive to	Comment noted.	Fish and Wildlife
E	8	South Dakota Game, Fish and Parks	2/11/2019	Under the Migratory Bird Treaty Act (MBTA), it is unlawful to pursue, hunt, take, capture, kill, possess, sell, purchase, barter, import, export or transport any migratory bird, or any part, nest or egg of any such bird, unless authorized under a permit issued by the Secretary of the Interior. Take is defined in regulations as: "pursue, hunt, shoot, wound, kill, trap, capture or collect or attempt to pursue, hunt, shoot, wound, kill, trap, capture or collect." A list of species protected by the MBTA can be found here: https://www.fws.gov/birds/management/managed-species/migratory-bird-treaty-act-protectedspecies.php. A number of protected species and their nests were identified by the developer during the 1 year of pre-construction wildlife surveys. Threats to species protected by the MBTA specific to the solar facility include removal of nests when clearing riparian areas of trees,	Comment noted. Lookout Solar has committed to avoiding ground clearing activities during the migratory bird nesting season (typically May 1 to August 15, unless: 1) surveys are performed prior to construction to identify and mark nests for avoidance or 2) potential nesting habitat is removed outside of the breeding season (i.e. mowing).	Fish and Wildlife

Letter Number	Comment Number	Entity	Date of Comment	Comment	Response	Comment Topic
E	9	South Dakota Game, Fish and Parks	2/11/2019	The developer proposes to use underground transmission lines, which will reduce impacts to avian species. We include the following information for the reviewers and developers to consider if any above-ground power lines will be a part of the project. Avian use of energized poles includes perching (for hunting and roosting), nesting, and resting (including shelter during inclement weather). Large birds (e.g. eagles, hawks) that use energized poles can be electrocuted if energized equipment is not insulated properly to minimize risks. Other avian species could potentially collide with the lines, including waterfowl, and sharp-tailed grouse, which do not generally perch on tall transmission lines. If any aboveground transmission lines are built in addition to the proposed underground transmission line, South Dakota Game, Fish and Parks recommends all new construction should follow or exceed Avian Power Line Interaction Committee (APLIC) construction design standards for avian-safe passage and use. See https://www.aplic.org/ for specific guidance on how to mitigate collision and electrocution risks to avian species. Ways to reduce	No above-ground transmission lines are proposed for this Project	Fish and Wildlife
E	10	South Dakota Game, Fish and Parks	2/11/2019	The NHD search also indicated an historic record of a fringe-tailed myotis (Myotis thysanodes) approximately 5 miles north west of the proposed substation location. In addition, a number of other bat species were recorded in the northern portion of Badlands National Park, approximately 10 miles north of the project area. While there are no records in the NHD of bats in the immediate project area, the close proximity and similar terrain could indicate a high use area of bat activity in southwestern South Dakota. The developers of the Lookout Solar project conducted one year of bat pre-construction acoustic monitoring. Their results verified the presence of Townsend's big-eared bat (Corynorhinus townsendii), big brown bat (Eptesicus fuscus), silver-haired bat (Lasionycteris noctivagans), western small-footed myotis (Myotis cilio/abrum), little brown bat (M. Jucifigus), finged myotis (M. thysanodes), and long-legged myotis (M. Vo/ans). The fringed myotis, silver-haired bat and Townsend's big-eared bat are classified as a species of greatest conservation need in South Dakota. Bats have the potential to collide with meteorological and communication towers associated with a project, and may also be susceptible to collision with solar panels (Harrison et al. 2016).	While the Project has not developed a mortality monitoring plan, Lookout Solar intends to report any incidental bird and bat mortality to SDGFP and WAPA for ap period of 2 years post-construction.	Fish and Wildlife
E	11	South Dakota Game, Fish and Parks	2/11/2019	The search of the NHD also revealed an historic record of a large stand (-5o,ooo individuals) of Barr's Milkvetch (Astragalus barrii) in the immediate project area in Ogalala Lakota County. Barr's Milkvetch is globally ranked as very rare and local throughout its range, and is regionally endemic in southwestern South Dakota. We also found a number of records for Barr's Milkvetch within a 10 mile radius of the project area, indicating this project area likely supports a population of this rare plant species. We ask that	Comment noted.	Vegetation
E	12	South Dakota Game, Fish and Parks	2/11/2019	Swift fox (Vulpes velox) are listed as state threatened by SDGFP. Swift fox typically inhabit short grass to midgrass prairies with gently rolling topography. Swift fox will enlarge burrows of other burrowing animals (e.g. black tailed prairie dogs) or create their own dens in loose soils (Higgins et al. 2000). Habitat loss is the greatest threat to swift fox populations throughout its range. No records of swift fox occur within the project area, however suitable habitat exists within the project boundary. Additionally, swift fox were reintroduced into Badlands National Park, and the surrounding area in the early 2000's (Samsal 2011). If a swift fox den is discovered during construction of the project, SDGFP recommends avoiding construction in the immediate area (0.25 mile buffer), if feasible. Wildlife surveys completed by the developer indicate that prairie dog towns were identified in the project area by biologists during site visits. We recommend not siting project components within prairie dog colonies (if feasible) to reduce disturbance to swift fox habitat, as well as to reduce the risk of collision for avian predators that may forage in prairie dog	The environmental commitments regarding swift fox are located in section 3.7.1 of the draft EA.	Fish and Wildlife
E	13	South Dakota Game, Fish and Parks	2/11/2019	The project area is also home to populations of mule deer (Odocoileus hemionus), whitetail deer (O.virginianus) and antelope (Antilocapra americana). We do not anticipate this project to pose a significant impact to these species. However, the use of a barbed wire fence rather than a woven wire fence to exclude livestock from the project would be preferred. Adult deer can easily jump a woven wire fence, but fawns cannot, and can be left stranded. The ideal wildlife-friendly fence should be 40" or less, and the top two wires should be no less than 12" apart. Deer and antelope can easily tangle their back legs if the top wires are too close together. The bottom wire or rail should be high enough for antelope, calves and fawns to crawl under, at least 18" from the ground. Barbless wire for the top and bottom strands will prevent snagging and injuries. It is also advantageous to make the fence highly visible, not only for deer and antelope, but also for low-flying bird species such as grouse and owls. If the developers prefer to fence out livestock and wildlife from the project area, we suggest a woven wire fence 7-8' tall to exclude deer and antelope. If such practice is implemented, GFP would request to be contacted to conduct a site visit to assure big game animals are void of a fenced-in facility. The wire should be installed tight to the ground. For more information on building wildlife-friendly	The commitment to use wildlife-friendly fencing techniques is located in section 3.7.1 of the draft EA. The solar generating facility and substation would be fenced using wildlife-friendly fencing techniques, as described herein. Specifically, a barbed wire fence or a woven wire fence would be used with the following specifications that would minimize impacts to mule deer, whitetail deer, and antelope. Where woven fence exclusions are used, they would be 7-8' tall and SDGFP would be contacted to conduct a site visit to assure big game animals are excluded from the fenced-in facility. Where barbed wire fence is used, the height would be 40" or less, the top two wires would be no less than 12" apart, and the bottom wire or rail would be at least 18" from the ground. Further, barbless wire would be used for the top and bottom strands and the fence would be highly visible through use of location, marking, or materials	Fish and Wildlife
E	14	South Dakota Game, Fish and Parks	2/11/2019	To better understand the project design and construction approach to assist further analysis of potential environmental impacts, we recommend the developers schedule a joint meeting with SDGFP and the U.S. Fish and Wildlife Service representatives to further discuss project details and wildlife concerns. We appreciate the opportunity to provide comments on this project. Please	Comment noted.	General
F	1	Sierra Club of South Dakota	1/12/2019	I am writing you today concerning the Lookout Solar Project as the chief executive of the Sierra Club's state chapter, a lobbyist, and a resident. This project is very exciting as we need to transition away from fossil fuels quickly but the devil is in the details. You must be transparent with the tribal nations. It is their land and they've lost too much to European expansion. They must have an active role in making critical decisions and the project must provide economic development for the tribes. Henry Red Cloud of Pine Ridge has been training and installing solar power for years. It would be wise to consult with him. I'm looking forward to seeing the completion of this project. Please don't hesitate if there is anything I can do to help.	Tribal consultation activities are summarized in Chapters 1.4 and 3.8.	Tribal Consultation
G	1	U.S. Fish and Wildlife Service	12/6/2018	I received your letter to notify people about this project. Is this your request to initiate Section 7 consultation or will you do that at a later date? You can get listed species information for this site: https://ecos.fws.gov/ipac/	WAPA had determined "no effect" to listed species and no Section 7 consultation is warranted.	Fish and Wildlife

Affidavit of Publication

STATE OF SOUTH DAKOTA

County of Fall River SS:

Sheri Sponder being first duly sworn, upon his/her oath says: That he/she is now and was at all time hereinafter mentioned, an employee of the Rapid City Journal, a corporation of Rapid City, South Dakota, the owner and publisher of the HOT SPRINGS STAR, a legal and daily newspaper printed and published in Sturgis, in said County of Fall River, and has full and personal knowledge of all the facts herein stated as follows: that said newspaper is and at all of the times herein mentioned has been a legal and daily newspaper with a bonafide paid circulation of at least Two Hundred copies weekly, and has been printed and published in the English language, at and within an office maintained by the owner and publisher thereof, at Hot Springs, in said Fall River County, and has been admitted to the United States mail under the second class mailing privilege for at least one year prior to the publication herein mentioned; that the advertisement, a printed copy of which, taken from said Hot Springs Star, the paper in which the same was published, is attached to this sheet and made a part of this affidavit, was published in said paper once each week for two successive weeks, the first publication there of being on the 28th day of Nov 2018 that the fees charged for the publication there of are 242 dollars and 88 cents.

Sheri Sponder

Subscribed and sworn to before me this 7th day of December, 2018.

Kerri Berard

Notary public

8/21/2019

My commission expires

KERRI BERARD
NOTARY PUBLIC
SOUTH DAKOTA
SEAL SEAL

Public comments are sought to define the scope and alternatives for an Environmental Assessment of a proposed solar energy facility in Custer and Oglala Lakota Counties, to the south of Buffalo Gap, South Dakota. The proposed project, to be called the Lookout Solar Project, would include up to 110 MW solar generating facility, an underground power collection system, project substation, a new overhead transmission line, access roads, and a maintenance and operation center. Construction of the Lookout Solar Project is proposed to begin as early as September of 2019.

Western Area Power Administration will hold one public scoping meeting (open house format) to provide an opportunity for interested parties to discuss the Project with resource specialists and to submit comments. The meeting will be held on Wednesday, December 5, 2018, from 5:00 p.m. to 7:00 p.m., at the Hot Springs Public Library. The meeting location is handicapped accessible.

To learn more about this project and to share your ideas, join us at:

5:00 to 7:00 p.m. on Wednesday, December 5, 2018
Hot Springs Public Library
2005 Library Drive
Hot Springs, SD 57747

Comments may be submitted in the following ways:

- By mail to:
  Western Area Power Administration
  Attn: Ms. Christina Gomer
  2900 4th Avenue North
  Billings, MT 59101
- By fax to (406) 255-2900
- By phone to (406) 255-2811
- By email to gomer@wapa.gov
- In writing at the public scoping open house meeting.

Comments should be postmarked no later than January 7, 2019.

(Published twice at an approximate cost of $242.88)

Affidavit of Publication

STATE OF SOUTH DAKOTA

County of Pennington SS:

Sheri Sponder being first duly sworn, upon his/her oath says: That he/she is now and was at all time hereinafter mentioned, an employee of the RAPID CITY JOURNAL, a corporation of Rapid City, South Dakota, the owner and publisher of the RAPID CITY JOURNAL, a legal and daily newspaper printed and published in Rapid City, in said County of Pennington, and has full and personal knowledge of all the facts herein stated as follows: that said newspaper is and at all of the times herein mentioned has been a legal and daily newspaper with a bonafide paid circulation of at least Two Hundred copies daily, and has been printed and published in the English language, at and within an office maintained by the owner and publisher thereof, at Rapid City, in said Pennington County, and has been admitted to the United States mail under the second class mailing privilege for at least one year prior to the publication herein mentioned; that the advertisement, a printed copy of which, taken from said Rapid City Journal, the paper in which the same was published, is attached to this sheet and made a part of this affidavit, was published in said paper once each day for two successive days, the first publication there of being on the 1st day of Dec 2018 that the fees charged for the publication there of are 233 dollars and 30 cents.

Sheri Sponder

Subscribed and sworn to before me this 7th day of December, 2018.

CATHY DABNEY SEAL NOTARY PUBLIC SEAL STATE OF SOUTH DAKOTA

Cathy L. Dabney

Notary public

4-16-2024

My commission expires

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Hot Springs, SD 57747

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- By email to gomer@wapa.gov
- In writing at the public scoping open house meeting.

Comments should be postmarked no later than January 7, 2019.

(Published twice at an approximate cost of $233.30)

LAKOTA COUNTRY TIMES

PO Box 386, Martin, SD 57551 Phone: 605-685-1868 FAX:605-685-1870

US Postal Permit Number: USPS 024-176

AFFIDAVIT OF PUBLICATION

State of South Dakota, County of Bennett:

Roseanna Hammock of said county, being first duly sworn, on oath, says that he/she is the Editor/Publisher or an employee of the Publisher of the Lakota Country Times, a weekly newspaper published in the county of Bennett for circulation in the counties of Bennett and Shannon and Todd in South Dakota; That he/she has full and personal knowledge of the facts herein stated, that said newspaper is a legal newspaper as defined in SDCL 17-2-2.1 through 17-2-2,4 inclusive, that said newspaper has been published within the said County of Bennett and State of South Dakota, for a least one year prior to the first publication of the attached public notice, and that the legal advertisement headed:

NOTICE : PUBLIC INPUT ENCOURAGED

A printed copy of which, taken from the paper in which the same was published, and which is hereto attached and made a part of this affidavit, was published in said newspaper for 1 successive weeks) to wit:

NOV 29	2018	Volume 15	Issue #11
	2018	Volume 15	Issue #
	2018	Volume 15	Issue #
	2018	Volume 15	Issue #

That the full amount of the fee charged for the publication of the attached public notice inures to the sole benefit of the publisher or publishers; that no agreement or understanding for the division thereof has been made with any other person, and that no part thereof has been agreed to be paid to any person whomsoever; that the fees charged for the publication thereof are:

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Signed: Roseanna Hammock

Subscribed and sworn to before me this date: 12-18, 2018

Signed: Connie Smith

Notary Public in and for the County of Bennett, South Dakota

My Commission expires Dec. 13, 2019

CONNIE L. SMITH
SEAL NOTARY PUBLIC SOUTH DAKOTA SEAL

BIDS & PROPOSALS

15-13-0005

PUBLIC INPUT ENCOURAGED!

Public comments are sought to define the scope and alternatives for an Environmental Assessment

o a proposed solar energy facility in Custer and Oglala Lakota Counties, to the south of Buffalo Gap South Dakota. The proposed project, to be called the Lookout Solar Project would include up to 110 MW solar generating facility, an underground power collection system, project substation, a new overhead transmission line, access roads, and a maintenance and operation center. Construction of the Lookout Solar P oject is proposed to begin as early as September of 2019.

Western Area Power Administration will hold one public scoping meeting (open house format) to prov de an opportunity for interested parties to discuss the Project with resource specialists and to submit comments. The mee ing will be held on Wednesday, December 5, 2018, from 5:00 p.m. to 7:00 p.m., at the Hot Springs Public Library. The meeting location is handicapped accessible.

To learn more about this project and to share your ideas, join us at:

5:00 to 7:00 p.m. on Wednesday, December 5, 2018
Hot Springs Public Library
2005 Library Drive
Hot Springs, SD 57747

Comments may be submitted in the following ways:

- By mail to:
  Western Area Power Administration
  Attn: Ms. Christina Gomer
  2900 4th Avenue North
  Billings MT 59101
- By fax to (406) 255-2900
- By phone to (406) 255-2811
- By email to gomer@wapa.gov
- In writing at the public scoping open house meeting.

Comments should be postmarked no later than January 7 2019.

Affidavit of Publication

STATE OF SOUTH DAKOTA

County of Fall River SS:

Sheri Sponder being first duly sworn, upon his/her oath says: That he/she is now and was at all time hereinafter mentioned, an employee of the Rapid City Journal, a corporation of Rapid City, South Dakota, the owner and publisher of the HOT SPRINGS STAR, a legal and daily newspaper printed and published in Sturgis, in said County of Fall River, and has full and personal knowledge of all the facts herein stated as follows: that said newspaper is and at all of the times herein mentioned has been a legal and daily newspaper with a bonafide paid circulation of at least Two Hundred copies weekly, and has been printed and published in the English language, at and within an office maintained by the owner and publisher thereof, at Hot Springs, in said Fall River County, and has been admitted to the United States mail under the second class mailing privilege for at least one year prior to the publication herein mentioned; that the advertisement, a printed copy of which, taken from said Hot Springs Star, the paper in which the same was published, is attached to this sheet and made a part of this affidavit, was published in said paper once each week for two successive weeks, the first publication there of being on the 2nd day of Jan 2019 that the fees charged for the publication there of are 336 dollars and 25 cents.

Sheri Sponder

Subscribed and sworn to before me this 11th day of January, 2019.

Kerri Berard

Notary public

8/21/2019

My commission expires

KERRI BERARD
NOTARY PUBLIC
SOUTH DAKOTA
SEAL SEAL

Public Input Encouraged!

Public comments are sought to define the scope and alternatives for an Environmental Assessment of a proposed solar energy facility in Custer and Oglala Lakota Counties, to the south of Buffalo Gap, South Dakota. The proposed project, to be called the Lookout Solar Project, would include approximately 110 MW solar generating facility, an underground power collection system, project substation, an underground transmission line, access roads, and a maintenance and operation center. Construction of the Lookout Solar Project is proposed to begin as early as September of 2019.

Western Area Power Administration will hold an additional public scoping meeting (open house format) to provide an opportunity for interested parties to discuss the Project with federal officials, including resource specialists, and to submit comments. The meeting will be held on Wednesday, January 16, 2019, from 5:00 p.m. to 7:00 p.m., at the Hot Springs Public Library. The meeting location is handicapped accessible.

To learn more about this project and to share your ideas, join us at:

5:00 to 7:00 p.m. on Wednesday, January 16, 2019
Hot Springs Public Library
2005 Library Drive
Hot Springs, SD 57747

Comments may be submitted in the following ways:

- By mail to:

Western Area Power Administration
Attn: Ms. Christina Gomer
2900 4th Avenue North
Billings, MT 59101

- By fax to (406) 255-2900
- By phone to (406) 255-2811
- By email to gomer@wapa.gov
- In writing at the public scoping open house meeting.

Comments should be postmarked no later than February 19, 2019.

(Published three times at the approximate cost of $336.25)

Affidavit of Publication

STATE OF SOUTH DAKOTA

County of Pennington SS:

Sheri Sponder being first duly sworn, upon his/her oath says: That he/she is now and was at all time hereinafter mentioned, an employee of the RAPID CITY JOURNAL, a corporation of Rapid City, South Dakota, the owner and publisher of the RAPID CITY JOURNAL, a legal and daily newspaper printed and published in Rapid City, in said County of Pennington, and has full and personal knowledge of all the facts herein stated as follows: that said newspaper is and at all of the times herein mentioned has been a legal and daily newspaper with a bonafide paid circulation of at least Two Hundred copies daily, and has been printed and published in the English language, at and within an office maintained by the owner and publisher thereof, at Rapid City, in said Pennington County, and has been admitted to the United States mail under the second class mailing privilege for at least one year prior to the publication herein mentioned; that the advertisement, a printed copy of which, taken from said Rapid City Journal, the paper in which the same was published, is attached to this sheet and made a part of this affidavit, was published in said paper once each week for two successive weeks, the first publication there of being on the 2nd day of Jan 2019 that the fees charged for the publication there of are 324 dollars and 95 cents.

Sheri Sponder

Subscribed and sworn to before me this 11th day of January, 2019.

Kerri Berard

Notary public

8/21/19

My commission expires

KERRI BERARD
NOTARY PUBLIC
SOUTH DAKOTA
SEAL SEAL

Public Input Encouraged!

Public comments are sought to define the scope and alternatives for an Environmental Assessment of a proposed solar energy facility in Custer and Oglala Lakota Counties, to the south of Buffalo Gap, South Dakota. The proposed project, to be called the Lookout Solar Project, would include approximately 110 MW solar generating facility, an underground power collection system, project substation, an underground transmission line, access roads, and a maintenance and operation center. Construction of the Lookout Solar Project is proposed to begin as early as September of 2019.

Western Area Power Administration will hold an additional public scoping meeting (open house format) to provide an opportunity for interested parties to discuss the Project with federal officials, including resource specialists, and to submit comments. The meeting will be held on Wednesday, January 16, 2019, from 5:00 p.m. to 7:00 p.m., at the Hot Springs Public Library. The meeting location is handicapped accessible.

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- By fax to (406) 255-2900
- By phone to (406) 255-2811
- By email to gomer@wapa.gov
- In writing at the public scoping open house meeting.

Comments should be postmarked no later than February 19, 2019.

(Published three times at the approximate cost of $324.95)

Appendix B: Aquatic Resource Inventory Report

LOOKOUT SOLAR PROJECT

AQUATIC RESOURCE INVENTORY REPORT

CUSTER AND OGLALA LAKOTA COUNTIES, SOUTH DAKOTA

August 10, 2018

Project #: 52V-001-001

SUBMITTED BY: Trihydro Corporation

1252 Commerce Drive, Laramie, WY 82070

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1.0 INTRODUCTION

On behalf of Lookout Solar, LLC. (Lookout Solar), Trihydro Corporation (Trihydro) hereby submits this aquatic resource inventory report for the Lookout Solar Farm and associated infrastructure (Project Area) to the United States Army Corps of Engineers (Corps). The Project Area is located approximately 10 miles east of Buffalo Gap, South Dakota and intersects portions of Custer and Oglala Lakota Counties (Figure 1). The Solar Farm will be located on the Pine Ridge Indian Reservation (Reservation) and connect to an approximate 10-acre substation via a 9-mile long buried transmission line cable that is located west of the Reservation. The purpose of this Project is to generate solar energy, provide public education on the benefits of solar energy, encourage future renewable-energy interest and investments, and reduce greenhouse gas (GHG) emissions across the Reservation. The Project Area consists of private land, including trust land within the Reservation.

1.1 PURPOSE

The primary purpose of this report is to present the results of an aquatic resource inventory conducted within the Project Area. The results of this inventory will be submitted to the Corps along with a jurisdictional determination request and will be incorporated into a supplemental Environmental Assessment (EA) being developed for the Project. No wetlands have been previously delineated for this Project. It was determined that an on-site delineation was necessary to facilitate a jurisdictional determination and subsequent permitting. As such, Trihydro performed a site assessment to determine the current footprint of aquatic resources in the Project Area. The results of the onsite assessment are presented in the following sections.

1.2 PHYSICAL DESCRIPTION OF LOOKOUT SOLAR PROJECT AREA

The Project Area is located with Township 6 South, Range 8, Sections 11, 12, and 14; Township 6 South, Range 9 East, Section 18, 19, 26-29, 35, and 36; and Township 41 North, Range 26, 27, 28, 29, 19, 18, 35, 36, and 41 North, Range 48 West, Sections 35 and 36. The Project Area will include an 840-acre solar farm, an approximate 10-acre substation, and nine linear miles of buried transmission line cable. The transmission line cable will be installed within road right-of-ways, which range in width from 66 to 100 feet. The transmission line will be drilled underneath the Cheyenne River using a horizontal directional drill (HDD). This method may be used for other stream or wetland crossings, depending on the final placement of the transmission line within the right-of-way and pending Corps permit requirements. The Project Area is located nine miles east of the town of Buffalo Gap, South Dakota. The solar farm is located on the western boundary of the Reservation and consists of 840 acres immediately north of road BIA 2 and west of the BIA 2 and Trevillyan Road intersection. The substation is located approximately eight miles northwest of the solar farm, and consists of approximately 10 acres of land located one-quarter mile south of County Highway 719.

Current land uses include agriculture production and rangeland. Current aquatic resources include the Cheyenne River, Cottonwood Creek, the Angustora Canal, intermittent drainages, emergent wetlands, and livestock reservoirs.

1.3 ECOLOGY

The Project Area is located within two Major Land Resource Areas (MRLAs) and includes the Pierre Shale Plains and the Mixed Sandy and Silty Tableland and Badlands of the Northwestern Great Plains Ecoregion (EPA 2017). The proposed transmission line and substation are located within the Pierre Shale Plains, and the solar farm is located within the Mixed Sandy and Silty Tableland and Badlands. These MRLAs are generally dominated by either short or tall grass species, with lower densities of forb, shrub, and tree cover. The Project Area is characterized by mixed-grass prairie species, such as little bluestem (*Schizachyrium scoparium*), buffalograss (*Bouteloua dactyloides*), western wheatgrass (*Pascopyrum smithii*), green needlegrass (*Nassella viridula*), fescue (*Festuca spp.*), purple three-awn (*Aristida purpurea*), and prairie junegrass (*Koeleria macrantha*). A number of invasive grasses including cheatgrass (*Bromus tectorum*) and field brome (*Bromus arvensis*) are common in grassland habitat, with smooth brome (*Bromus inermis*) present along roads and adjacent to disturbed areas. In some grassland habitats, primarily within the Mixed Sandy and Silty Tableland Badlands, stands of sand sagebrush (*Artemisia filifolia*) are present with a small percentage of fringed sage (*Artemisia frigida*), yucca, and various forbs present as well.

Riparian areas located within the Project Area occur along the Cheyenne River and Cottonwood Creek. Several sources of open, ponded water also exist in the Project Area and serve as reservoirs for livestock. Riparian areas exhibit woody overstories comprised of eastern cottonwood (*Populus deltoides*), box elder (*Acer negundo*), and Russian olive (*Elaeagnus angustifolia*). Understories include shrubland and grassland species such as western snowberry (*Symphoricarpos occidentalis*) and smooth brome. Emergent wetlands are dominated by narrowleaf cattail (*Typha angustifolia*), bulrush (*Shoenoplectus spp.*), spike rush (*Eleocharis palustris*), prairie cordgrass (*Spartina pectinata*), and other hydrophytic species.

1.4 WATERSHED AND HYDROLOGY

The Cheyenne River originates from the confluence of several creeks in the Thunder Basin National Grassland, which is located within Converse County, Wyoming. The River flows east of its headwaters, into the southwestern boarder of South Dakota and ultimately serves as a tributary of the Missouri River in central South Dakota (United States Geological Survey [USGS] 2017). The Cheyenne River and Project Area are located within the Cheyenne Basin (hydrologic unit code [HUC] 101201) that extends from southwestern South Dakota to northeastern Wyoming, to the northwestern portion of Nebraska (USGS 2017). Within the Cheyenne Basin, the sub-basin watershed in which the Project Area is located is the Middle Cheyenne-Spring sub-basin watershed (HUC 10120109). The drainage area for

the Middle Cheyenne-Spring Basin encompasses approximately 1,000 square miles, extending into portions of Custer, Pennington, Oglala Lakota, and Fall River Counties (USGS 2017). The majority of the catchment are for the Middle Cheyenne-Spring Basin consists of mostly undeveloped rangeland, with cultivated agricultural land concentrated near ephemeral water sources.

Two primary drainages occur in the Project Area; the Cheyenne River and Cottonwood Creek, the latter of which is a small tributary to the Cheyenne River. Numerous small drainages also intersect the proposed transmission line where culverts allow surface water to flow under the road and eventually to the Cheyenne River during high flow. The Angustora Canal is also crossed by the transmission line between the Cheyenne River crossing and the Cottonwood Creek crossing. This man-made canal flows north and eventually into Cottonwood Creek just upstream of its confluence with the Cheyenne River. In addition, a few small, closed depressional wetlands occur within the solar farm. Aquatic resources within the Project Area are displayed on Figures 2 through 8.

1.5 JURISDICTIONAL WATERS OF THE U.S.

In 1972, the U.S. Congress enacted the Clean Water Act (CWA) after recognizing the continual acceleration of degradation to the Nation's waters. The purpose of the CWA is to sustain and protect the physical, chemical, and biological integrity of the waters of the U.S. The Corps is responsible for overseeing the nation's wetlands, which are federally regulated through Section 404 of the CWA and Section 10 of the Rivers and Harbors Act (RHA) (33 USC 1344).

The definition of "waters of the United States" currently in effect is the definition promulgated in 1986/1988, implemented consistent with subsequent Supreme Court decisions and guidance documents. The 2015 revised regulatory definition of "waters of the United States" has been stayed by the U.S. Court of Appeals for the Sixth Circuit. In response to this stay, EPA, Department of Army, and Army Corps of Engineers resumed nationwide use of the agencies' prior regulations defining the term "waters of the United States." On February 28, 2017, the President of the United States issued an Executive Order directing EPA and Department of the Army to review and rescind or revise the 2015 Rule. EPA, Department of Army, and the Army Corps of Engineers are in the process of reviewing the 2015 rule and considering a revised definition of "waters of the United States" consistent with the Executive Order. Therefore, according to the 1986/1988 regulatory definition (40 CFR 230.3[s]), the term "waters of the United States" means:

1. All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide.
2. All interstate waters including interstate wetlands.

3. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:
    a. Which are or could be used by interstate or foreign travelers for recreational or other purposes.
    b. From which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
    c. Which are used or could be used for industrial purposes by industries in interstate commerce.
4. All impoundments of waters otherwise defined as waters of the United States under this definition.
5. Tributaries of those waters identified in numbers 1 through 3, listed above.
6. The territorial sea.
7. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in numbers 1 through 6, listed above; waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 CFR 423.11[m] which also meet the criteria of this definition) are not waters of the United States.

Several regulatory guidance documents have been published that describe Section 404 permit compliance activities. These documents, including the *1987 Wetland Delineation Manual* (Corps 1987) and Corps *Interim Regional Supplements,* provide the methodologies and guidelines necessary to determine whether an area is a wetland as defined by Section 404. For an area to be considered a jurisdictional wetland, it must contain positive evidence of hydrophytic vegetation, hydric soils, and wetland hydrology. The manual and applicable regional supplements provide methodology to be used in the field for this three-tiered approach.

1.6 REGIONAL SUPPLEMENT

In March 2010, as an update to the 1987 Corps Manual, the Corps published the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region (Version 2.0)* (Corps 2010). This document was developed in cooperation with the Great Plains Regional Working Group, by the U.S. Army Engineer Research and Development Center, at the request of the Corps, with funding through the Wetlands Regulatory Assistance Program. The purpose of this regional supplement is to provide guidance for performing wetland delineations in the Great Plains Region, which consists of all or portions of 11 states, including Colorado, Kansas, Minnesota, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas, and Wyoming. The Great Plains Region is subdivided into five subregions or Land Resource Regions (LRRs), including the Northern Great Plains (LRR F), Western Great

Plains (LRR G), Central Great Plains (LRR H), Southwestern Prairies (LRR J), and the Southwest Plateaus and Plains (LRR I). The Project Area is located in LRR G.

The *Great Plains Regional Supplement* takes precedence over the *1987 Wetland Delineation Manual*, where applicable. Such differences include regional criteria specific to making determinations on the presence or absence of hydrophytic vegetation, hydric soils, and wetland hydrology. Changes to the hydrophytic vegetation criteria include simplification of the indicator plant status and modifications to the prevalence index and dominance test calculations. In addition, plant morphological adaptations can be used as supplemental evidence for whether or not wetland plants dominate a site. Changes to hydric soil criteria include regional soil type criteria that are more characteristic of soils in the Great Plains. Finally, additional guidance is provided, which helps the wetland delineator apply wetland hydrology indicators across the Great Plains Region. An area is a wetland if indicators of hydrophytic vegetation and hydric soils are present along with indicators of wetland hydrology. Additional wetland indicators are provided for problematic wetland situations, namely areas with temporal shifts in vegetation or hydrology; drought conditions; sparse vegetation; riparian strips; artificial or managed plant communities; and areas affected by fire, drought, or other natural disturbances. Trihydro utilized the *Great Plains Regional Supplement* as the technical basis for identifying and delineating potential wetlands at the Project Area. The scope of the determination is limited to identifying those wetlands that may be "waters of the United States" and therefore subject to Section 404 of the CWA and Section 10 of the RHA.

1.7 SIGNIFICANT NEXUS DETERMINATION

The U.S. Supreme Court Case, Rapanos v. United States, enacted two new analytical standards for designating traditional navigable waters (TNWs) (including wetlands adjacent to non-TNWs). Both of these standards are subject to CWA jurisdiction: (1) if the water body is relatively permanent, or if the water body is a wetland that directly abuts a relatively permanent water (RPW) body, or (2) if a water body, in combination with all wetlands adjacent to the water body, has a significant nexus to TNWs. A significant nexus exists if the water body in question has an effect on the chemical, physical, and/or biological properties of downstream TNWs. The classes of water bodies subject to CWA jurisdiction include: (1) non-navigable tributaries that do not typically flow year-round or have continuous flow at least seasonally; (2) wetlands adjacent to such tributaries; and (3) wetlands adjacent to, but not directly abutting, a relatively permanent non-navigable tributary.

2.0 METHODS

2.1 DATA REVIEW

A review of available information relative to jurisdictional waters of the U.S. was performed in-house prior to visiting the Project Area. The following data sources were identified and used during the wetland delineation and are described in greater detail below:

- Spatial data for the proposed Project Area, including the substation and linear cable route (provided by the Project proponent)
- Aerial photographs of the Project Area, Google Earth Imagery (12/2016)
- U.S. Department of Agriculture, Natural Resource Conservation Service (NRCS), *Soil Survey of Custer and Oglala Lakota Counties* (Soil Survey Staff 2018) and U.S. Department of Agriculture NRCS National Hydric Soil List (NRCS 2015)
- National Wetlands Inventory (NWI) data (USFWS 2018a)

2.2 AERIAL PHOTOGRAPH REVIEW

Aerial photographs for the Project Area, generated by Google Earth, were reviewed prior to the on-site delineation. Google Earth Imagery includes aerial photographs from December 2016. Inundation was visible within the area of the proposed solar farm at approximately nine locations, in the form of ponded water. No inundation was apparent within the area of the proposed substation. Natural intermittent drainage features and a man-made irrigation canal that intersect the linear extent of the Project Area (i.e. proposed transmission line cable) were evident during the aerial photograph review.

2.3 NRCS SOIL SURVEY

The Project Area is located within two counties. These counties may have received soil surveys at different scales, times, level of detail, or with a different land use in mind, resulting in distinct information that may not be directly comparable to the adjacent county (Soil Survey Staff 2018). As such, soil series identified within Oglala Lakota and Custer Counties may be named differently but exhibit similar soil characteristics. Soils within the Project Area are shown on Figure 9.

2.3.1 OGLALA LAKOTA COUNTY SOIL SURVEY

The soil survey identified 26 unique soil series; however, five of these soils constitute approximately 85% of the Project Area. These predominant soil series include: Anselmo-Valentine complex (5 to 20% slopes), Pierre clay (3 to 9% slopes), Richfield-Altvan silt loams (0 to 3% slopes), Valentine sand (3 to 30% slopes), and Tuthill-Anselmo fine sandy loams (3 to 9% slopes). The Anselmo-Valentine complex comprises 432 acres (46%) of the Project Area. These soils are well- to excessively-drained soils with a fine sandy loam texture. Anselmo-Valentine soils are derived from sandstone, and are found amongst hillslopes in Nebraska, Kansas, South Dakota, and Wyoming. The Anselmo-Valentine complex is not prime farmland, and its predominant land use includes rangeland production. Pierre clay is a well-drained soil derived from shale parent material found in hillslopes of Nebraska and South Dakota. This soil series comprises 140 acres (15%) of the Project Area; and, while this series is not hydric, it is classified as farmland of statewide importance. Predominant land use includes rangeland and supplemental agricultural production. Richfield-Altvan silt loams and Tuthill-Anselmo fine sandy loam complexes comprise 122 acres (13%) and 34 acres (4%), respectively. These soils contain hydric soil components and are included on the South Dakota list of hydric soils (NRCS 2015). Similar to other soils in the Project Area, these soils primarily serve rangeland production. The Valentine sand series is an excessively drained soil derived from Eolian sand parent material. This series is common amongst dunes in Nebraska, South Dakota, and Wyoming, and is not recognized as hydric or prime farmland. This series constitutes 68 acres (7%) of the Project Area and primarily serves rangeland production. Of the 21 remaining soil series, most represent less than 1% of the Project Area. Table 1 contains the acreages of all 26 soil series in the Project Area and their associated hydric soil rating and prime farmland classification.

2.4 NATIONAL WETLAND INVENTORY

Data layers from the NWI indicate the extent, approximate location, and type of wetlands within the U.S. These data delineate the aerial extent of wetlands and surface waters as defined by Cowardin et al. (1979). NWI data indicate that within the proposed solar farm, a freshwater pond and five palustrine emergent (PEM) wetlands may be present. In the remainder of the Project Area, NWI data suggests that several hydrologic features may intersect the proposed transmission line cable route, including intermittent riverine drainages, PEM wetlands, and a palustrine scrub-shrub (PSS) wetland. A single perennial riverine feature (i.e. Cheyenne River) was identified in the central portion of the Project Area. No potential wetland resources were identified in the proposed substation. NWI data are shown on Figures 2-8. Cottonwood Creek and the Angustora Canal, both classified as intermittent streams, are also crossed by the transmission line. It is important to note that NWI data are not synonymous with on-site delineated wetlands and are a tool used to identify potential wetlands at a landscape scale.

2.5 WETLAND DELINEATION METHODOLOGY

The following is a summary of the routine procedures that were used to determine the presence or absence of wetlands at the Project Area:

- **Step 1:** Identify and locate the project area. The Project Area includes the solar farm, the substation, and the transmission cable line route located at the boundary between Custer and Oglala Lakota Counties (Figure 1).
- **Step 2:** Determine whether an atypical situation exists. Atypical situations include the following: a) unauthorized activities, b) natural events, and c) unplanned man-induced wetlands. Although a man-made irrigation canal (i.e. Angostura Canal) was identified within the Project Area, this is a permanent feature and does not constitute an atypical situation for the Project Area.
- **Step 3:** Determine the size of the Project Area. The Project Area encompasses approximately 850 acres, with additional acreage resulting from the transmission cable line. The study area was determined by using aerial photography. Therefore, baseline transects were not required for the field delineation.
- **Step 4:** Identify the plant community types. Four plant communities were identified within the Project Area. They include the following: developed or disturbed, cultivated cropland, riparian and wetland, and grassland.
- **Step 5:** Select and evaluate representative sample observation points using the Great Plains Region Wetland Determination Data Forms (Corps 2010):
    - Evaluate whether normal environmental conditions are present on-site. Abnormal weather conditions, including heavy rainfall or drought, may influence the presence of some wetland indicators. For instance, heavy rainfall may raise water levels, and result in the presence of hydrology in areas that are typically upland. Conditions within the Project Area were considered normal in regard to the Wetland Determination Data Forms provided in the *Great Plains Regional Supplement* (Corps 2010).
    - Establish an observation point in each plant community type. Twenty-nine observation points were selected to represent the community types identified at the Project Area. One to two observation points were selected within each wetland, with at least one observation point selected within an upland area adjacent to the wetland. When assessing NWI wetlands, if all three indicators (hydrophytic vegetation, hydric soil, and hydrology) were absent, only one determination point (upland) was recorded. It was determined that an adequate number of observation points were selected to accurately characterize wetland boundaries.
    - Characterize wetland indicators at each sample point. Vegetation, soil, and hydrologic indicators were assessed at each sample point using the Wetland Determination Data Form and methods described in the *Great Plains Regional Supplement* (Corps 2010). The data collected for these points are presented in Appendix A

and summarized in Table 2. Determination points were selected to accurately identify the wetland/upland interface.

- **Step 6:** Wetland Determination. Each observation point was examined to determine whether wetland indicators of all three parameters (vegetation, soils, and hydrology) are, or would normally be, present during a significant portion of the growing season. If so, the sample point was considered to be within a wetland. If evidence was not found at the sample point to suggest that the location would normally have wetland indicators for all three parameters, then the area was considered an upland. Samples were obtained from various locations within the Project Area to identify the approximate boundary between wetland and upland areas. Depending on the size of the wetland, one or two representative sample points were documented for each wetland and associated upland area. The Wetland Determination Data Forms completed for the Project Area are provided in Appendix A.

In addition to the wetland delineation methods described above, wetlands, open water ponds, and streams were delineated and classified using the Cowardin Wetlands and Deepwater Habitat Classification system (Cowardin et al. 1979) so as to distinguish between different types of aquatic resource types. For the purposes of this Aquatic Resource Inventory Report, wetlands are considered PEM wetlands, palustrine scrub-shrub (PSS), and palustrine open water (POW). POW wetlands were delineated based on ordinary high-water mark.

2.6 STREAM ASSESSMENT METHODOLOGY

All stream channels within the Project Area were classified as Intermittent Riverine with Streambed (R4SB), with the exception of the Cheyenne River (RU2BG) (Cowardin et al. 1979). Nine riverine segments (eight intermittent; one perennial) were identified using NWI data. Intermittent streams were not delineated on-site using Wetland Delineation Field Forms. If intermittent stream drainages were observed on-site, they were digitized using a combination of aerial imagery and a hand-held Global Positioning System (GPS). During the 2018 on-site assessment, surface water was exhibited in the Cheyenne River, the Angostura Canal, and Cottonwood Creek. The locations of culverts were also recorded using a GPS (Figures 3-8).

3.0 RESULTS

This section provides a discussion of the results of the on-site aquatic resource inventory. The discussion includes vegetation, soil, hydrologic, and other data used to determine aquatic resource boundaries. Aquatic resources were delineated to obtain baseline information for this Project Area, prior to the development of the solar farm and associated infrastructure.

3.1 AQUATIC RESOURCE FINDINGS

Aquatic resources were delineated between June 11 and June 15, 2018, using the data collected from 29 field observation points. Aquatic resources identified include wetlands, intermittent stream drainages, and a river. Wetlands within the Project Area were characterized as either PEM, PSS, or POW. The R4SB features identified using NWI data were verified on-site, and their locations were recorded using a GPS. Approximately 100 feet of intermittent stream were delineated upstream and downstream of the Project Area (Figures 3-8). A single, perennial riverine (R2UBG) feature was identified in the Project Area using the NWI data and consists of the Cheyenne River. In total, 1.3 acres of aquatic resources were delineated within the Project footprint including 0.9 acres of PEM, 0.3 acres of PSS, 0.1 acres of R2UBG, less than 0.01 acres of POW, and nine intermittent riverine streams (R4SB) (Figures 3-8). Of the nine intermittent streams, eight were classified as R4SB7 (vegetated streambed) and one was classified as R4SBFx (Angustora Canal). Acreages for each aquatic resource delineated within the Project Area are presented in Table 3. The results from each wetland and upland sample point are summarized in Table 2. Wetland Determination Data Forms are provided in Appendix A. Photographs of each sample point are provided in Appendix B. Figures 3-8 show the location of each on-site wetland and upland sample location and the field delineated boundaries of aquatic resources within the Project Area.

3.1.1 PALUSTRINE AND RIVERINE SYSTEMS

In total, 22 unique aquatic resources (9 PEM, 1 PSS, 2 POW, 1 R2UBG, and 9 R4SB) were delineated in the Project Area. PEM wetlands comprised 0.9 acres, the single PSS wetlands comprised 0.3 acres, and the POW wetlands comprise less than 0.01 acres. The Cheyenne River (R2UBG) comprises 0.2 acres. One of the R4SB features consists of the Angostura Canal, a human-excavated canal warranting the special modifier, “x” (Cowardin et al. 1979). The solar farm was void of distinct drainage features, and the wetlands delineated in this area consisted of PEM wetlands. The proposed substation did not contain any wetland features. The proposed transmission line cable route was intersected by PEM and PSS, R4SB, and R2UBG. A single PSS wetland was delineated along the southern bank of the Cheyenne River and was consistent with the PSS wetland layer identified using the NWI data (Figure 4). Generally, the NWI data accurately represented the delineated wetland boundaries, with the exception of Sample Points 8C and

9A-12B. At Sample Point 8C, NWI data suggested the area was PSS, but the on-site assessment resulted in the determination that this area is disturbed and is void of any wetland indicators. Within Sample Points 9A-12B, the delineated PEM wetland boundaries were more extensive than those depicted by the NWI data (Figure 6). In areas apparently lacking hydrology indicators, the lowest or wettest spots were preferentially selected for sampling, under the assumption that these areas would yield the highest number of wetland indicators. If the sample lacked one or more wetland indicators, it was determined that no wetland was present and no delineation was necessary (i.e. Sample Points 3, 5, 13, 14, and 16).

3.1.1.1 FRESHWATER EMERGENT AND SCRUB-SHRUB WETLANDS

Using the Cowardin Classification System (Cowardin et al. 1979), all palustrine wetlands were characterized as PEM or PSS. Most occurred in semi-open depressions located within the proposed solar farm. These depressions were dispersed geographically and isolated from drainage channels (i.e. Sample Points 1, 2, 4, and 6). Semi-closed depressions lack a defined exit channel, and are subject to inundation via overland flow in response to a large storm event. Limited surface water was present during the on-site assessment, but saturation was observed, indicating that water does not persist in these depressions. Additional PEM, PSS, and POW wetlands were characterized along the proposed transmission line cable route on the banks of the Cheyenne River. Wetlands identified within the Cheyenne River floodplain are likely subject to periods of temporary inundation during high flow conditions in response to storm events or seasonal snowmelt, resulting in the development of wetland indicators (i.e. Sample Points 7 and 8). The PEM wetlands that are not influenced by the Cheyenne River likely receive moisture from surrounding intermittent streams and ditches identified using the NWI data (Sample Points 9-12, and 15). The wetlands identified south of Cottonwood Creek are the largest of those delineated on-site. These wetlands boarder Cottonwood Creek and extend south to a series of roadside ditches (R4SBX) on the east and west side of County Road 719 (Figure 6). These roadside ditches likely receive surface water runoff during storm events, and the resulting flow temporarily inundates the wetlands delineated during the on-site assessment (Figures 6).

3.1.1.2 INTERMITTENT DRAINAGES

Using the Cowardin Classification System (Cowardin et al. 1979), all nine drainages were characterized as Intermittent Riverine with Streambed substrate (R4SB), and the Cheyenne River was classified as Perennial Riverine (R2UBG). The R4SB features may ultimately serve as tributaries to the Cheyenne River during high flow conditions, and hydrologic connectivity of these features is further described in Section 3.1.4. A GPS was used to delineate drainages approximately 100 feet upstream and downstream of the Project Area. Representative photographs drainages are provided in Appendix B.

3.1.2 WETLAND VEGETATION

Vegetation identified within delineation areas included native and introduced species. Road disturbance areas exhibited greater densities of introduced species. The most commonly observed grassland plant species included smooth brome (*Bromus inermis*), slender wild rye (*Elymus trachycaulus*), curly blue grass (*Poa secunda*), narrow-leaf cattail (*Typha angustifolia*), and western wheatgrass (*Pascopyrum smithii*). Dominant plant species observed within the shrubland areas consisted of narrow-leaf willow (*Salix exigua*), eastern cottonwood (*Populus deltoides*), and Russian olive (*Elaeagnus angustifolia*). Commonly observed wetland species identified on-site include common spike rush (*Eleocharis palustris*), short-awn meadow foxtail (*Alopecurus aequalis*), and freshwater cord grass (*Spartina pectinata*). The USFWS Information for Planning and Consultation system and the South Dakota County Species List suggested that habitat may support a federally threatened forb, the western prairie fringe orchid (*Platanthera praeclara*) (USFWS 2017, 2018b). Currently, no known populations of the prairie fringe orchid are documented in South Dakota; however, the species remains listed because status surveys within the State may have overlooked populations (USFWS 2017). Suitable habitat in South Dakota includes moist, calcareous, silt loams and sub-irrigated sand prairies that exhibit tall grasses and sedge meadows (South Dakota Technical Guide 2002). Detailed vegetation data pertaining to each sample location are provided in Table 2. The plant list for species observed during the on-site assessment is 2018 is provided in Table 4.

3.1.3 WETLAND SOILS

Soil characteristics were assessed at the upland and wetland sample locations within the Project Area from depths of 12 to 20 inches, depending on whether a restrictive layer was contacted with the shovel. Detailed soil data pertaining to each sample location are provided in Table 2, along with Wetland Determination Data Forms provided in Appendix A.

Soil matrix color within the on-site upland areas consisted of values between 2.5YR 4/2; and 10YR 2/2 and 5/1, according to the Munsell Soil Color Charts. As shown in the Munsell Soil Color Chart, hydric soils generally have a chroma value less than two (Munsell 2000). Hydric soils observed at wetland Sample Points in this Project Area varied between from 2.5YR 4/2; 7.5YR 4/1; 10YR 4/1, 4/2, and 5/1; and GLEY 1 3/10Y, 3/N, 4/N, and 5/N. Hydric soils were similar in value and chroma colors to those that were observed in the upland soils, but generally more depleted. In addition, gleying, mottling, and prominent redox concentrations were apparent in wetland soils. Hydric indicators observed include loamy gleyed matrix (F2), depleted matrix (F3), and redox depressions (F8). The hydric soil indicator for redox depressions was applicable to Sample Points collected within closed-depression landforms located within the proposed solar farm. Redox concentrations in upland and wetland sample points varied between 2.5YR 6/6; 5YR 4/6, 5/6, and 5/8; 7.5YR 3/4, 4/6, 5/4, 5/5, 5/6, and 6/6; and 10YR 4/6, 5/6, 5/8, and 6/6. Soil textures ranged from predominantly loamy or sandy in the upland areas to mostly clayey in wetland areas.

3.1.4 WETLAND HYDROLOGY

Surface water runoff from the adjacent upland areas provides hydrology for the on-site wetlands. The primary indicators of wetland hydrology included: water-stained leaves, saturation, algal mat or crust, drift deposits, and aquatic invertebrates. Secondary indicators included: FAC-neutral test, surface soil cracks, and drainage patterns. Some primary and secondary indicators were observed at in upland Sample Points, where the point was placed near the wetland edge, indicating occasional high water into upland areas. Hydrologic indicators for each sample location are shown in Appendix A and in Table 2.

Significant nexus, as defined in Section 1.7, may include tributaries of waterbodies that exhibit seasonal flow (e.g. intermittent streams). A review of aerial imagery, in conjunction with the on-site assessment of wetlands, suggests that some wetlands (approximately one acre) within the Project Area may ultimately serve as tributaries to the Cheyenne River, a TNW. As such, these areas may be subject to Corps jurisdiction. Notably, the PEM wetlands delineated in the proposed solar farm consist of geographically isolated depressions (approximately one-half acre) that lack connectivity to surrounding drainages. As such, these areas likely lack significant nexus criteria and are therefore not likely to be subject to Corp jurisdiction.

4.0 CONCLUSIONS

Trihydro, on behalf of Lookout Solar, performed an aquatic resource inventory in 2018 to assess the current footprint of aquatic resources. In 2018, a total of 1.3 acres of aquatic resources were delineated within the Project Area including 1.1 acres of wetlands (PEM, PSS, and POW), and 0.2 acres of river (R2UBG). The largest wetlands were delineated adjacent to the Cheyenne River and immediately south of Cottonwood Creek. Additionally, nine intermittent streams (R4SB) that intersect the Project Area were identified during the 2018 on-site assessment (Figure 6). Two of the intermittent streams are man-man features including the Angustora Canal and a small drainage ditch near Cottonwood Creek. Specific acreages for each aquatic resource type are show in Table 3.

In summary, nine intermittent streams and the Angostura Canal are crossed by the transmission line route and connect downstream to the Cheyenne River, a TNW. These streams, the Cheyenne River, and wetlands adjacent to these features are subject to Corps jurisdiction. The protection of these aquatic resources will promote the continuation of healthy ecological function within the Project Area and the surrounding landscape, including utilization by livestock, plants and wildlife. If proposed disturbance occurs on more than one-half acres of jurisdictional wetland or 300-linear feet of stream, a general Nationwide Permit 12 may be required.

5.0 REFERENCES

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TABLES

TABLE 1. PROJECT AREA SOILS
LOOKOUT SOLAR, LLC., CUSTER AND OGLALA LAKOTA COUNTIES, SOUTH DAKOTA

Soil Series	Acres in Project Area	Percent of Project Area	Prime Farmland Classification	Hydric Soil Rating
Anselmo-Valentine complex, 5 to 20 percent slopes	431.73	46.29	Not prime farmland	No
Pierre clay, 3 to 9 percent slopes	140.33	15.04	Farmland of statewide importance	Yes
Richfield-Altvan silt loams, 0 to 3 percent slopes	121.52	13.03	Prime farmland if irrigated	Yes
Valentine sand, 3 to 30 percent slopes	67.50	7.24	Not prime farmland	No
Tuthill-Anselmo fine sandy loams, 3 to 9 percent slopes	34.27	3.67	Prime farmland if irrigated	Yes
Jayem fine sandy loam, 3 to 9 percent slopes	23.27	2.50	Farmland of statewide importance	Yes
Pierre clay, 2 to 6 percent slopes	19.67	2.11	Not prime farmland	Yes
Tuthill-Anselmo fine sandy loams, 0 to 3 percent slopes	12.20	1.31	Prime farmland if irrigated	Yes
Lohmiller silty clay loam	11.87	1.27	Farmland of statewide importance	Yes
Kyle clay, 0 to 2 percent slopes	9.64	1.03	Farmland of statewide importance	Yes
Nunn clay loam, 0 to 2 percent slopes	9.50	1.02	Prime farmland if irrigated	Yes
Samsil clay, 15 to 40 percent slopes	9.44	1.01	Not prime farmland	No
Jayem fine sandy loam, 0 to 3 percent slopes	8.84	0.95	Prime farmland if irrigated	Yes
Satanta loam, 0 to 2 percent slopes	8.15	0.87	Prime farmland if irrigated	No
Pierre-Samsil, moderately deep clays, 6 to 25 percent slopes	5.55	0.60	Not prime farmland	Yes
Lohmiller silty clay, channeled, 0 to 3 percent slopes, occasionally flooded	4.60	0.49	Not prime farmland	Yes
Schamber-Samsil complex, 15 to 40 percent slopes	2.83	0.30	Not prime farmland	No
Pierre clay, 6 to 20 percent slopes	2.51	0.27	Not prime farmland	No
Pierre-Hisle complex, 0 to 9 percent slopes	2.40	0.26	Not prime farmland	No
Bankard loamy fine sand, 0 to 4 percent slopes	1.99	0.21	Not prime farmland	Yes
Arvada loam, 0 to 3 percent slopes	1.48	0.16	Not prime farmland	No
Valent loamy fine sand, 6 to 25 percent slopes	1.23	0.13	Not prime farmland	No
Haverson loam, 0 to 2 percent slopes, rarely flooded	1.06	0.11	Prime farmland if irrigated	Yes
Kyle clay, 2 to 6 percent slopes	0.59	0.06	Farmland of statewide importance	No
Water	0.47	0.05	NA	NA
Satanta loam, 2 to 6 percent slopes	0.04	0.00	Prime farmland if irrigated	Yes
Altvan loam, 2 to 6 percent slopes	0.02	0.00	Prime farmland if irrigated	No

Note: "NA" = not applicable ground cover

TABLE 2. WETLAND DELINEATION RESULTS BY SAMPLE POINT
LOOKOUT SOLAR, LLC., CUSTER AND OGLALA LAKOTA COUNTIES, SOUTH DAKOTA

Sample ID	Vegetation Observed	USACE Status	Hydrophytic Vegetation Present?	Soils Observed (Dominant Matrix/Chroma)	Soil Mottles Observed	Hydric Soils Present?	Hydrology	Hydrology Present?	Wetland Indicators Present (hydric soils (HS), hydrophytic vegetation (HV), and hydrology (HY))?	Is the Sampling Point Within a Wetland?
1A	*Eleocharis palustris* *Alopecurus aequalis*	OBL OBL	Yes	0-3" 10YR 3/2 3-9" GLEY 1 4/N 9-16" 10YR 4/2	7.5 YR 5/6 7.5 YR 5/6 7.5 YR 5/6	Yes	Saturation, algal mat or crust, FAC-Neutral Test	Yes	HS, HV, HY	Yes
1B	*Elymus trachycaulus* *Eleocharis palustris* *Bromus inermis* *Poa secunda* *Alopecurus aequalis* *Grindelia squarrosa*	FACU OBL UPL FACU OBL UPL	No	0-3" 10YR 3/2 3-16" 10YR 3/1	7.5 YR 4/6 No	No	No hydrology indicators were observed	No	None	No
2A	*Eleocharis palustris*	OBL	Yes	0-1" 10YR 3/3 1-10" 10YR 4/1 10-16" 10YR 4.5/2	No 5YR 5/6 No	Yes	Algal mat or crust, water-stained leaves, FAC-Neutral Test	Yes	HS, HV, HY	Yes
2B	*Elymus trachycaulus* *Bromus inermis* *Poa secunda* *Tragopogon dubius* *Grindelia squarrosa*	FACU UPL FACU UPL UPL	No	0-12" 10YR 3/1	No	No	No hydrology indicators were observed	No	None	No
3	*Elymus trachycaulus* *Alopecurus aequalis* *Bromus inermis*	FACU OBL UPL	Yes	0-4" 10YR 3/2 4-10" 10YR 3/2 10-16" 10YR 3/3	10YR 6/6 10YR 6/6 No	No	Algal mat or crust, water-stained leaves, FAC-Neutral Test	Yes	HV, HY	No
4A	*Eleocharis palustris* *Sagittaria sp.*	OBL OBL	Yes	0-4" 10YR 4/1 4-7" GLEY 1 4/N 7-16" 2.5 YR 4/2	10YR 5/6 10YR 5/6 No	Yes	Algal mat or crust, FAC-Neutral Test, saturation	Yes	HS, HV, HY	Yes
4B	*Elymus trachycaulus* *Eleocharis palustris* *Alopecurus aequalis*	FACU OBL OBL	No	0-2" 10YR 3/2 2-13" 10YR 4/3	7.5YR 5/8 10YR 6/6	No	Surface soil cracks, FAC-Neutral Test	Yes	HY	No
5	*Eleocharis palustris* *Alopecurus aequalis* *Juncus interior* *Elymus trachycaulus* *Eleocharis acicularis*	OBL OBL FACW FACU OBL	Yes	0-5" 10YR 3/2 5-14" 10YR 2/2	7.5YR 4/6 7.5YR 4/6	No	Aquatic invertebrates, FAC-Neutral Test	Yes	HV, HY	No
6A	*Eleocharis palustris* *Alopecurus aequalis*	OBL OBL	Yes	0-4" 10YR 3/2 4-10" 10YR 4/1 10-16" 10YR 4/2	7.5 YR 6/6 7.5 YR 4/6 7.5 YR 4/6	Yes	Algal mat or crust, water-stained leaves, aquatic	Yes	HS, HV, HY	Yes
6B	*Elymus trachycaulus* *Alopecurus aequalis*	FACU OBL	No	0-3" 10YR 3/2 3-12" 10YR 3/2	7.5YR 5/6 7.5YR 5/6	No	Water-stained leaves	Yes	HY	No

TABLE 2. WETLAND DELINEATION RESULTS BY SAMPLE POINT
LOOKOUT SOLAR, LLC., CUSTER AND OGLALA LAKOTA COUNTIES, SOUTH DAKOTA

Sample ID	Vegetation Observed	USACE Status	Hydrophytic Vegetation Present?	Soils Observed (Dominant Matrix/Chroma)	Soil Mottles Observed	Hydric Soils Present?	Hydrology	Hydrology Present?	Wetland Indicators Present (hydric soils (HS), hydrophytic vegetation (HV), and hydrology (HY))?	Is the Sampling Point Within a Wetland?
7A	*Salix exigua* *Populus deltoides* *Asclepias speciosa* *Sagittaria rigida* *Spartina pectinata*	FACW FAC FAC OBL FACW	Yes	0-3" 2.5YR 3/2 (silty clay) 3-4" 2.5YR 3/2 (sandy clay) 4-8" GLEY 1 3/10Y 8-16" GLEY 1 4/N	No No 10YR 6/6 7.5YR 4/6	Yes	Drift deposits, water-stained leaves, surface soil cracks, FAC-Neutral Test	Yes	HS, HV, HY	Yes
7B	*Typha angustifolia*	OBL	Yes	0-1" 10YR 2/1 1-8" 7.5YR 4/1 8-16" 10YR 4/1	No 5YR 5/8 10YR 5/8	Yes	Saturation, drift deposits, water-stained leaves, FAC-Neutral Test	Yes	HS, HV, HY	Yes
7C	*Elaeagnus angustifolia* *Salix exigua* *Populus deltoides* *Elymus trachycaulus* *Alopecurus aequalis* *Pascopyrum smithii* *Grindelia squarrosa* *Monolepis nuttalliana* *Rumex crispus* *Glycyrrhiza lepidota* *Melilotus officinalis* *Bromus inermis* *Spartina pectinata*	FACU FACW FAC FACU OBL FACU UPL FAC FAC FACU FACU UPL FACW	Yes	0-16" 10YR 4/3	7.5YR 4/6	No	No hydrology indicators were observed	No	HY	No
8A	*Salix exigua* *Eleocharis acicularis* *Typha angustifolia* *Spartina pectinata*	FACW OBL OBL FACW	Yes	0-3" 10YR 4/1 3-16" 10YR 5/1	7.5YR 5/6 7.5YR 5/6	Yes	Sediment deposits, drift deposits, iron deposits, water-stained leaves, aquatic invertebrates, FAC-Neutral Test	Yes	HS, HV, HY	Yes
8B	*Elaeagnus angustifolia* *Populus deltoides* *Elymus trachycaulus* *Bromus arvensis* *Bromus inermis* *Agropyron cristatum* *Pascopyrum smithii* *Rumex crispus* *Lepidium densiflorum* *Melilotus officinalis* *Bromus tectorum* *Hordeum jubatum*	FACU FAC FACU FACU UPL UPL FACU FAC FAC FACU UPL FACW	No	0-8" 10YR 3/2 8-16" 10YR 3/2	5YR 4/6 (clay) 5YR 4/6 (sandy clay)	No	Water-stained leaves, surface soil cracks	Yes	HY	No
8C	*Elaeagnus angustifolia* *Populus deltoides* *Pascopyrum smithii* *Bromus tectorum* *Rumex crispus* *Hordeum jubatum* *Cirsium arvense* *Agropyron cristatum* *Bromus inermis* *Melilotus officinalis*	FACU FAC FACU UPL FAC FACW FACU UPL UPL FACU	No	0-12" 10YR 3/2	7.5YR 5/6	No	No hydrology indicators observed	No	None	No
9A	*Alopecurus aequalis* *Typha angustifolia* *Bromus inermis* *Chenopodium album*	OBL OBL UPL FACU	Yes	0-3" 10YR 3/2 3-10" 10YR 3/1 10-20" 10YR 4/1	No 7.5YR 4/6 7.5YR 4/6	Yes	Saturation, algal mat or curst, drainage patterns	Yes	HS, HY, HV	Yes
9B	*Elymus trachycaulus* *Lactuca serriola* *Bromus inermis* *Chenopodium album* *Pascopyrum smithii* *Spartina pectinata*	FACU FAC UPL FACU FACU FACW	No	0-3" 10YR 2/2 3-12" 10YR 3/2 12-16" GLEY 1 4/N	No 7.5YR 3/4 7.5YR 5/6	Yes	Drift deposits	Yes	HS, HY	No

TABLE 2. WETLAND DELINEATION RESULTS BY SAMPLE POINT
LOOKOUT SOLAR, LLC., CUSTER AND OGLALA LAKOTA COUNTIES, SOUTH DAKOTA

Sample ID	Vegetation Observed	USACE Status	Hydrophytic Vegetation Present?	Soils Observed (Dominant Matrix/Chroma)	Soil Mottles Observed	Hydric Soils Present?	Hydrology	Hydrology Present?	Wetland Indicators Present (hydric soils (HS), hydrophytic vegetation (HV), and hydrology (HY))?	Is the Sampling Point Within a Wetland?
10A	*Schoenoplectus sp.* *Typha angustifolia* *Eleocharis palustris* *Tradescantia occidentalis*	OBL OBL OBL UPL	Yes	0-7" 10YR 4/3 7-10" GLEY 1 3/N 7-10" GLEY 1 5/N	No 7.5YR 4/6 7.5YR 4/6	Yes	Saturation, algal mat or curst, water-stained leaves, drainage patterns, FAC-Neutral Test	Yes	HS, HV, HY	Yes
10B	*Sisybrium altissimum* *Lepidium densiflorum* *Bromus inermis* *Hordeum jubatum* *Pascopyrum smithii* *Spartina pectinata*	UPL FAC UPL FACW FACU FACW	No	0-4" 10YR 4/3 4-16" 10YR 4/1	No 7.5YR 5/4	Yes	Drift deposits, surface soil cracks	Yes	HS, HY	No
11A	*Populus angustifolia* *Acer negundo* *Asclepias speciosa* *Typha angustifolia* *Bromus inermis*	FACW FAC FAC OBL UPL	Yes	0-3" 10YR 3/2 3-10" 10YR 5/1 10-16" GLEY 1 5/N	7.5YR 4/6 5YR 5/6 7.5YR 4/6	Yes	Drift deposits, algal mat or crust, water-stained leaves, hydrogen sulfide odor, drainage patterns, FAC-Neutral Test	Yes	HS, HV, HY	Yes
11B	*Populus angustifolia* *Bromus inermis* *Poa secunda*	FACW UPL FACU	No	0-5" 10YR 3/2 5-16" 10YR 4/1	10YR 5/6 10YR 5/6	Yes	No hydrology indicators observed	No	HS	No
12A	*Typha angustifolia* *Alopecurus aequalis*	OBL OBL	Yes	0-5" 10YR 3/2 5-16" GLEY 1 4/N	10YR 4/6 10YR 4/6	Yes	Saturation, drift deposits, water-stained leaves, hydrogen sulfide odor, drainage patterns, FAC-Neutral Test	Yes	HS, HV, HY	Yes
12B	*Bromus inermis* *Cirsium undulatum* *Tragopogon dubius*	UPL FACU UPL	No	0-4" 10YR 3/2 4-16" 10YR 3/2	No No	No	No hydrology indicators observed	No	None	No
13	*Bromus inermis* *Equisetum sp.*	UPL FAC	No	0-16"10YR 3/3 0-16" 2.5YR 4/2	No 10YR 5/6	No	No hydrology indicators observed	No	None	No
14	*Eleocharis palustris* *Rumex crispus* *Poa secunda*	OBL FAC FACU	Yes	0-16" 10YR 4/3	7.5YR 5/8	No	Saturation	Yes	HV, HY	No
15A	*Salix fragilis* *Rumex crispus* *Eleocharis palustris* *Hordeum jubatum* *Spartina pectinata* *Sagittaria latifolia*	UPL FAC OBL FACW FACW OBL	Yes	0-10" GLEY 1 4/N 10-16" GLEY 1 4/N	5YR 4/6 (20%) 5YR 4/6 (40%)	Yes	Algal mat or crust, water-stained leaves, surface soil cracks, sparsely vegetated concave surface, FAC-Neutral Test	Yes	HS, HV, HY	Yes
15B	*Bromus inermis* *Elymus trachycaulus* *Poa secunda* *Agropyron cristatum* *Spartina pectinata*	UPL FACU FACU UPL FACW	No	0-16" 10YR 4/3	No	No	No hydrology indicators observed	No	None	No
16	*Cirsium arvense* *Poa secunda* *Melilotus officinalis* *Lepidium densiflorum* *Convolvulus arvensis* *Pascopyrum smithii* *Helianthus petiolaris* *Bromus inermis*	FACU FACU FACU FAC UPL FACU UPL UPL	No	0-4" 10YR 3/2 4-8" 10YR 3/1 8-16" GLEY 1 4/N	No 7.5YR 4/6 10YR 4/6	Yes	Drainage patterns	No	HS	No

Notes:
FAC = Facultative
FACW = Facultative Wetland
FACU = Facultative Upland
OBL = Obligate
UPL = Upland (Species not listed in the latest version of the US Army Corp Wetland Plant List were assumed to be UPL)

TABLE 3. AQUATIC RESOURCE TOTALS,
LOOKOUT SOLAR, LLC., CUSTER AND OGLALA LAKOTA COUNTIES, SOUTH DAKOTA

Project Area Description	PEM Wetland Acres	PSS Wetland Acres	POW Wetland Acres	Riverine Open Water Acres	Total Acres
Solar Farm	0.413	0.000	0.000	0.000	0.413
Transmission Cable Line	0.461	0.292	0.003	0.178	0.934
Substation	0.000	0.000	0.000	0.000	0.000
Total	0.874	0.292	0.003	0.178	1.347

Aquatic Resource	Acres
Wetlands	1.166
Ponds	0.003
River	0.178
Total	1.347

Note:

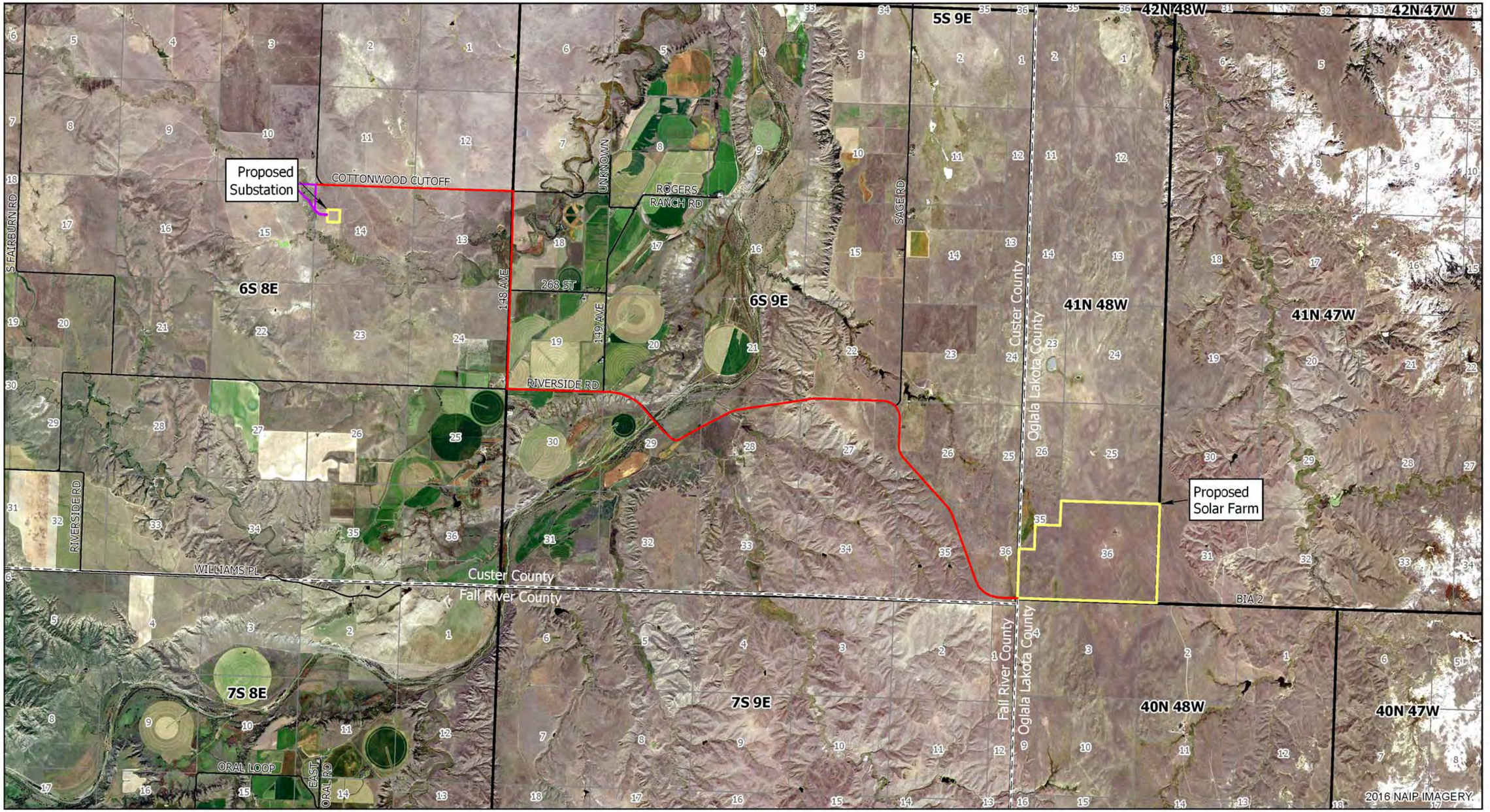
"PEM" = palustrine emergent wetlands, "PSS"= palustrine scrub shrub wetlands, "POW" = palustrine open water

TABLE 4. 2018 PLANT LIST
LOOKOUT SOLAR, LLC., CUSTER AND OGLALA AND LAKOTA COUNTIES, SOUTH DAKOTA

Scientific Name	Common Name	Wetland Indicator Status
Grasses		
Agropyron cristatum	crested wheatgrass	*UPL
Alopecurus aequalis	short-awn meadow foxtail	OBL
Bromus arvensis	field brome	FACU
Bromus inermis	smooth brome	UPL
Bromus tectorum	cheatgrass	UPL
Elymus trachycaulus	slender wild rye	FACU
Hordeum jubatum	foxtail barley	FACW
Pascopyrum smithii	western wheatgrass	FACU
Poa secunda	curly bluegrass	FACU
Forbs		
Asclepias speciosa	showy milkweed	FAC
Chenopodium album	lamb's quarters	FACU
Cirsium arvense	Canada thistle	FACU
Cirsium undulatum	wavy leaf thistle	FACU
Convolvulus arvensis	field bindweed	*UPL
Eleocharis acicularis	needle spike rush	OBL
Eleocharis palustris	common spike rush	OBL
Equisetum sp.	horsetail species	FAC
Glycyrrhiza lepidota	American licorice	FACU
Grindelia squarrosa	curly cup gumweed	UPL
Helianthus petiolaris	prairie sunflower	*UPL
Juncus interior	inland rush	FACW
Lactuca serriola	prickly lettuce	FAC
Lepidium densiflorum	miner's pepperwort	FAC
Melilotus officinalis	yellow sweetclover	FACU
Monolepis nuttalliana	Nuttall's poverty weed	FAC
Rumex crispus	curly dock	FAC
Sagittaria latifolia	duck potato	OBL
Sagittaria sp.	arrowhead species	OBL
Schoenoplectus sp.	rush species	OBL
Sisybrium altissimum	tall hedge mustard	UPL
Spartina pectinata	freshwater cordgrass	FACW
Tradescantia occidentalis	prairie spiderwort	UPL
Tragopogon dubius	yellow salsify	*UPL
Typha angustifolia	narrow-leaf cattail	OBL
Trees/Shrubs		
Acer negundo	box elder	FAC
Elaeagnus angustifolia	Russian olive	FACU
Populus deltoides	eastern cottonwood	FAC
Populus angustifolia	narrow-leaf cottonwood	FACW
Salix exigua	narrow-leaf willow	FACW
Salix fragilis	crack willow	*UPL

*Specie was not listed in the State of South Dakota 2016 Wetland Plant List and was therefore considered upland for delineation purposes.

FIGURES



EXPLANATION

- PROPOSED POWERLINE
- PROPOSED ACCESS ROAD
- PROPERTY BOUNDARIES

N

0 1 Mile

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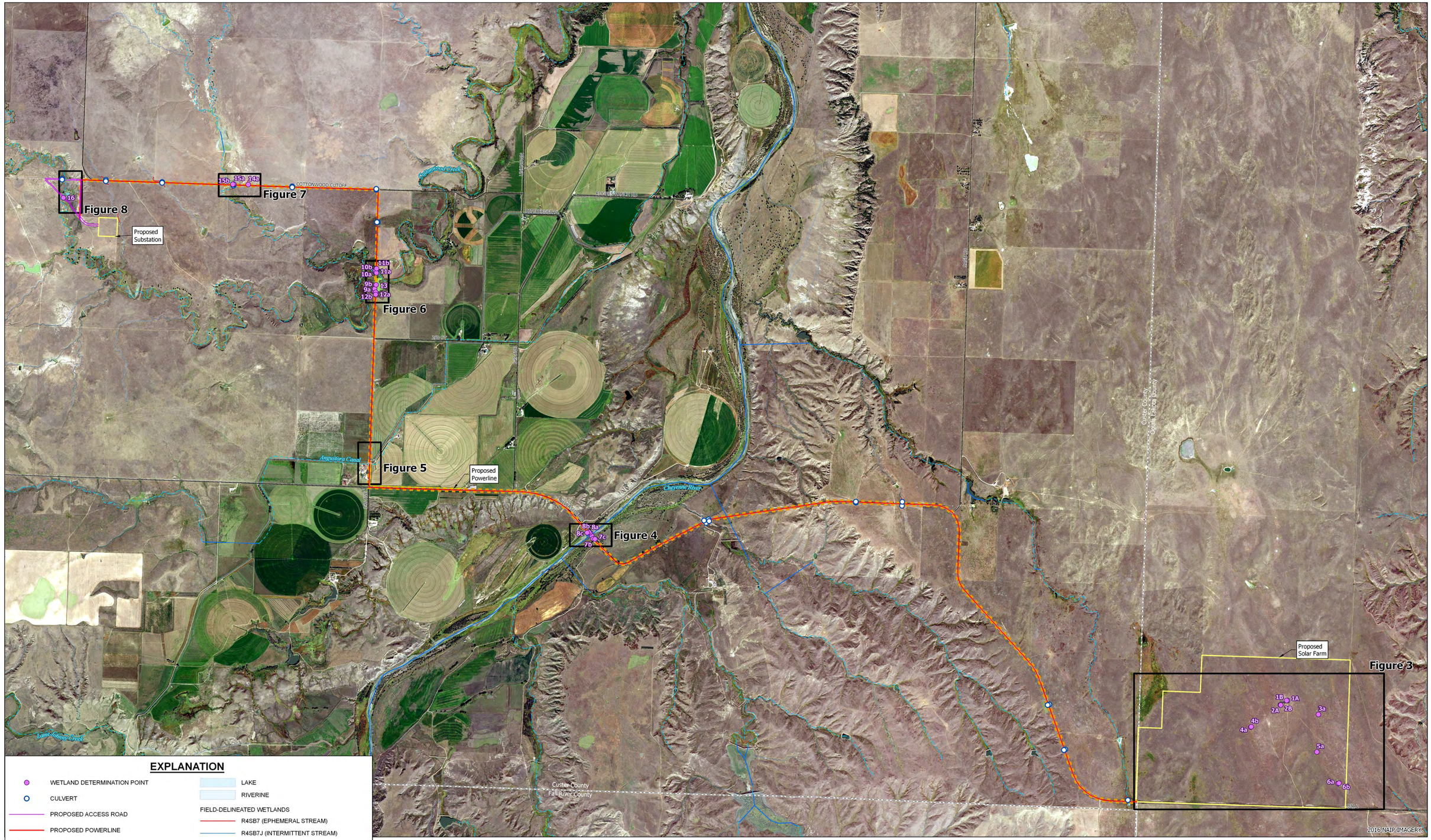
FIGURE 1

PROJECT AREA

AQUATIC RESOURCE INVENTORY REPORT
LOOKOUT SOLAR PARK I, LLC
CUSTER & OGLALA LAKOTA COUNTIES, SD

Drawn By: BR	Checked By: ES	Scale: 1" = 1 Mile	Date: 7/31/18	File: Lookout_ARI.aprx



EXPLANATION

- WETLAND DETERMINATION POINT
- CULVERT
- PROPOSED ACCESS ROAD
- PROPOSED POWERLINE
- RIGHT OF WAY BUFFER (33 & 50 FEET)

NATIONAL HYDROGRAPHY DATASET (USGS FEB. 2016)
- PERENNIAL STREAM
- INTERMITTENT STREAM

NATIONAL WETLAND INVENTORY (USFWS OCT. 2017)
- FRESHWATER EMERGENT WETLAND
- FRESHWATER FORESTED/SHRUB WETLAND
- FRESHWATER POND
- LAKE
- RIVERINE

FIELD-DELINEATED WETLANDS
- R4SB7 (EPHEMERAL STREAM)
- R4SB7J (INTERMITTENT STREAM)
- R4SB7X DITCH
- R4SBFX (ANGUSTORA CANAL)
- R4SBX DITCH
- PEM
- POW
- PSS
- R2UBG

N

0 1,500 3,000'

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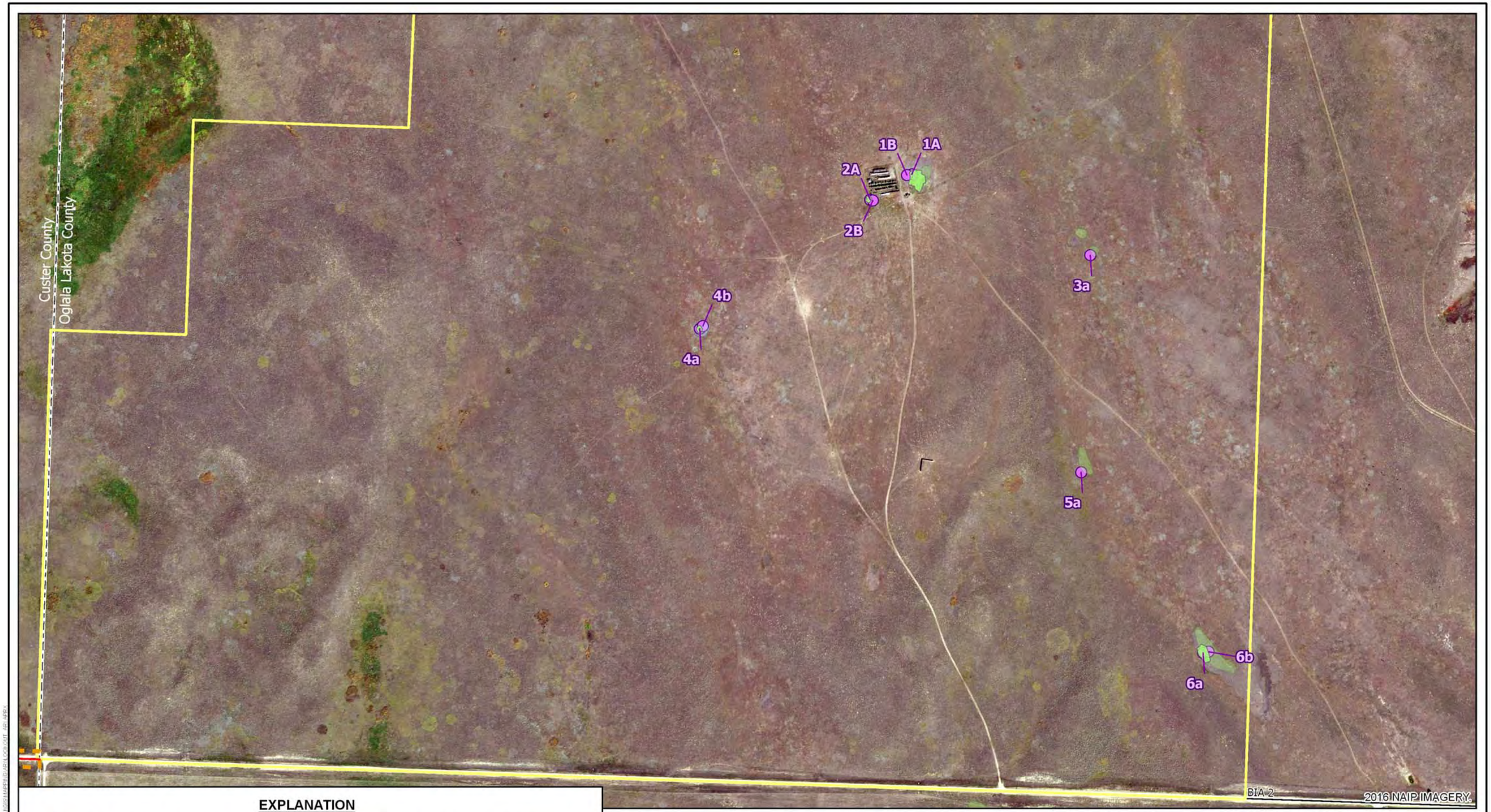
FIGURE 2

AQUATIC RESOURCES OVERVIEW

**AQUATIC RESOURCE INVENTORY REPORT
LOOKOUT SOLAR PARK I, LLC
CUSTER & OGLALA LAKOTA COUNTIES, SD**

Drawn By: BR	Checked By: ES	Scale: 1" = 1,500'	Date: 7/31/18	File: Lookout_ARI.aprx



EXPLANATION

- WETLAND DETERMINATION POINT
- PROPOSED POWERLINE
- RIGHT OF WAY BUFFER (33 & 50 FEET)

NATIONAL WETLAND INVENTORY (USFWS OCT. 2017)

- FRESHWATER EMERGENT WETLAND
- FRESHWATER POND

FIELD-DELINEATED WETLANDS

- PEM

N

0 600'

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L ramie, WY 82070
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FIGURE 3

SOLAR FARM WETLANDS

AQUATIC RESOURCE INVENTORY REPORT
LOOKOUT SOLAR PARK I, LLC
CUSTER & OGLALA LAKOTA COUNTIES, SD

Drawn By: BR	Checked By: ES	Scale: 1" = 600'	Date: 7/31/18	File: Lookout_ARI.aprx

EXPLANATION

- WETLAND DETERMINATION POINT
- PROPOSED POWERLINE
- RIGHT OF WAY BUFFER (33 & 50 FEET)

NATIONAL HYDROGRAPHY DATASET (USGS FEB. 2016)

- PERENNIAL STREAM

NATIONAL WETLAND INVENTORY (USFWS OCT. 2017)

- FRESHWATER EMERGENT WETLAND
- FRESHWATER FORESTED/SHRUB WETLAND
- RIVERINE

FIELD-DELINEATED WETLANDS

- PEM
- PSS
- R2UBG

N

0 100'

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FIGURE 4

CHEYENNE RIVER CROSSING

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CUSTER & OGLALA LAKOTA COUNTIES, SD

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\\TRIHYDRO.COM\CLIENTS\T\ONLOOKOUTSOLAR\PARK\GIS\MAPPING\ARI\LOOKOUT_ARI.APRX

EXPLANATION

- PROPOSED POWERLINE
- RIGHT OF WAY BUFFER (33 & 50 FEET)

NATIONAL HYDROGRAPHY DATASET (USGS FEB. 2016)

- CANAL

NATIONAL WETLAND INVENTORY (USFWS OCT. 2017)

- RIVERINE

FIELD-DELINEATED WETLANDS

- R4SBFX (ANGUSTORA CANAL)
- R4SBX DITCH

N

0 100'

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FIGURE 5

ANGUSTORA CANAL CROSSING

**AQUATIC RESOURCE INVENTORY REPORT
LOOKOUT SOLAR PARK I, LLC
CUSTER & OGLALA LAKOTA COUNTIES, SD**

Drawn By: BR	Checked By: ES	Scale: 1" = 100'	Date: 8/8/18	File: Lookout_ARI.aprx

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EXPLANATION

- WETLAND DETERMINATION POINT
- CULVERT
- PROPOSED POWERLINE
- RIGHT OF WAY BUFFER (33 & 50 FEET)

NATIONAL HYDROGRAPHY DATASET (USGS FEB. 2016)

- INTERMITTENT STREAM

NATIONAL WETLAND INVENTORY (USFWS OCT. 2017)

- FRESHWATER EMERGENT WETLAND
- FRESHWATER FORESTED/SHRUB WETLAND

FIELD-DELINEATED WETLANDS

- R4SB7J (INTERMITTENT STREAM)
- R4SBX DITCH
- PEM

N

0 100'

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FIGURE 6

COTTONWOOD CREEK CROSSING

AQUATIC RESOURCE INVENTORY REPORT
LOOKOUT SOLAR PARK I, LLC
CUSTER & OGLALA LAKOTA COUNTIES, SD

Drawn By: BR	Checked By: ES	Scale: 1" = 100'	Date: 8/8/18	File: Lookout_ARI.aprx

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EXPLANATION

- WETLAND DETERMINATION POINT
- CULVERT
- PROPOSED POWERLINE
- RIGHT OF WAY BUFFER (33 & 50 FEET)

NATIONAL HYDROGRAPHY DATASET (USGS FEB. 2016)

- INTERMITTENT STREAM

NATIONAL WETLAND INVENTORY (USFWS OCT. 2017)

- FRESHWATER EMERGENT WETLAND

FIELD-DELINEATED WETLANDS

- R4SB7 (EPHEMERAL STREAM)
- PEM
- POW

N

0 100'

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FIGURE 7

COTTONWOOD CUTOFF WETLAND CROSSING

AQUATIC RESOURCE INVENTORY REPORT
LOOKOUT SOLAR PARK I, LLC
CUSTER & OGLALA LAKOTA COUNTIES, SD

Drawn By: BR	Checked By: ES	Scale: 1" = 100'	Date: 7/31/18	File: Lookout_ARI.aprx

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16

Cottonwood Creek

EXPLANATION

- WETLAND DETERMINATION POINT
- CULVERT
- PROPOSED ACCESS ROAD
- PROPOSED POWERLINE
- RIGHT OF WAY BUFFER (33 & 50 FEET)

NATIONAL HYDROGRAPHY DATASET (USGS FEB. 2016)

- INTERMITTENT STREAM

NATIONAL WETLAND INVENTORY (USFWS OCT. 2017)

- FRESHWATER EMERGENT WETLAND
- RIVERINE

FIELD-DELINEATED WETLANDS

- R4SB7 (EPHEMERAL STREAM)
- R4SB7X DITCH
- PEM
- POW

2016 NAIP IMAGERY & 2017 UAS IMAGERY.

N

0 100'

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FIGURE 8

SUBSTATION ACCESS AREA WETLANDS

AQUATIC RESOURCE INVENTORY REPORT
LOOKOUT SOLAR PARK I, LLC
CUSTER & OGLALA LAKOTA COUNTIES, SD

Drawn By: BR	Checked By: ES	Scale: 1" = 100'	Date: 8/3/18	File: Lookout_ARI.aprx

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Map Unit Symbol	Map Unit Name
Aa	Lohmiller silty clay loam, channeled, 0 to 2 percent slopes
AaA	Altvan loam, 0 to 2 percent slopes
AaB	Altvan loam, 2 to 6 percent slopes
AaC	Altvan loam, 6 to 9 percent slopes
AbA	Altvan loam, 0 to 2 percent slopes
Ar	Arvada loam, 0 to 3 percent slopes
ArA	Arvada loam, 0 to 3 percent slopes
AsB	Ascalon fine sandy loam, 0 to 6 percent slopes
AsC	Ascalon fine sandy loam, 6 to 9 percent slopes
AvE	Anselmo-Valentine complex, 5 to 20 percent slopes
Ba	Badland
BaA	Baca silt loam, 0 to 4 percent slopes
Bb	Bankard fine sandy loam
BcB	Bankard loamy fine sand, 0 to 4 percent slopes
BfA	Beckton silt loam, 0 to 4 percent slopes
ClF	Colby silt loam, 9 to 40 percent slopes
CmC	Colby-Norka silt loams, 6 to 15 percent slopes
Co	Colombo loam, channeled
Eg	Egas silty clay loam
EkE	Epping-Kadoka silt loams, 9 to 18 percent slopes
Ga	Glenberg fine sandy loam
Gb	Glenberg fine sandy loam
GoA	Mobridge silt loam, 0 to 3 percent slopes
Gr	Nihill gravelly loam, 3 to 40 percent slopes
Ha	Haverson loam, 0 to 2 percent slopes, rarely flooded
Hc	Haverson loam, channeled
He	Hisle-Slickspots complex, 0 to 6 percent slopes
Hs	Hisle silt loam, 0 to 6 percent slopes
Hv	Hoven silt loam, 0 to 1 percent slopes
JaA	Jayem fine sandy loam, 0 to 3 percent slopes
JaB	Jayem fine sandy loam, 2 to 9 percent slopes
JaC	Jayem fine sandy loam, 3 to 9 percent slopes
KyA	Kyle clay, 0 to 2 percent slopes
KyB	Kyle clay, 2 to 6 percent slopes
KyC	Kyle clay, 6 to 9 percent slopes
Lm	Interior silt loam, 0 to 3 percent slopes

Map Unit Symbol	Map Unit Name
Lo	Lohmiller silty clay loam
Lp	Lohmiller silty clay, channeled, 0 to 3 percent slopes, occasionally flooded
N658E	Pierre silty clay, 6 to 25 percent slopes
N667E	Pierre-Samsil, moderately deep clays, 6 to 25 percent slopes
NgA	Norka silt loam, 0 to 2 percent slopes
NgB	Norka silt loam, 2 to 6 percent slopes
NuA	Nunn clay loam, 0 to 2 percent slopes
NuB	Nunn clay loam, 2 to 6 percent slopes
NuC	Nunn loam, 6 to 9 percent slopes
PeB	Pierre clay, 2 to 6 percent slopes
PeC	Pierre clay, 3 to 9 percent slopes
PeD	Pierre clay, 6 to 20 percent slopes
PhB	Pierre-Hisle complex, 0 to 9 percent slopes
RaA	Richfield-Altvan silt loams, 0 to 3 percent slopes
Rv	Riverwash
SaE	Samsil clay, 15 to 40 percent slopes
SbF	Samsil clay, 15 to 40 percent slopes
SeA	Satanta loam, 0 to 2 percent slopes
SeB	Satanta loam, 2 to 6 percent slopes
SgA	Satanta-Beckton complex, 0 to 3 percent slopes
SmB	Savo silt loam, 2 to 6 percent slopes
SmE	Schamber-Eckley complex, 9 to 40 percent slopes
Ss	Samsil-Rock outcrop complex, 10 to 50 percent slopes
StE	Schamber-Samsil complex, 15 to 40 percent slopes
Sw	Swanboy clay, 0 to 3 percent slopes
SzB	Swanboy clay, 0 to 3 percent slopes
TnA	Tuthill-Anselmo fine sandy loams, 0 to 3 percent slopes
TnC	Tuthill-Anselmo fine sandy loams, 3 to 9 percent slopes
TuB	Tuthill-Manter fine sandy loams, 3 to 5 percent slopes
VaE	Valent loamy fine sand, 6 to 25 percent slopes
VbD	Valent loamy fine sand, 6 to 25 percent slopes
Vs	Valentine sand, 3 to 30 percent slopes
W	Water
Wh	Whitelake fine sandy loam
Ww	Wortman-Wanblee silt loams, 0 to 6 percent slopes

Proposed Substation

Proposed Solar Farm

COTTONWOOD CUTOFF

ROUTE SEVEN PASS

PITTSBURG

Custer County
Fall River County

2016 NAIP IMAGERY

EXPLANATION

- PROPOSED POWERLINE
- PROPOSED ACCESS ROAD
- SOILS (NRCS JULY 2018)
- RIGHT OF WAY BUFFER (33 & 50 FEET)
- SOILS (NRCS JULY 2018)

N

0 1,500 3,000'

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FIGURE 9

SOIL SURVEY

AQUATIC RESOURCE INVENTORY REPORT
LOOKOUT SOLAR PARK I, LLC
CUSTER & OGLALA LAKOTA COUNTIES, SD

Drawn By: BR	Checked By: ES	Scale: 1" = 1,500'	Date: 8/8/18	File: Lookout_ARI.aprx

APPENDIX A

WETLAND DETERMINATION DATA FORMS

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Lookout Solar City/County: Oglala Lakota County Sampling Date: 06/12/2018

Applicant/Owner: Lookout Solar, LLC State: SD Sampling Point: 1A

Investigator(s): ES, SJ Section, Township, Range: Section 36, Township 41N, Range 48W

Landform (hillslope, terrace, etc.): Closed depression Local relief (concave, convex, none): Concave Slope (%): 0-1

Subregion (LRR): G Lat: 43.488004526 Long: -102.981066225 Datum: NAD_1983

Soil Map Unit Name: Richfield-Altvan silt loams, 0 to 3 percent slopes NWI classification: Palustrine Emergent

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** **Yes** X **No** _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Eleocharis palustris	95	Yes	OBL
2. Alopecurus aequalis	5	No	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** _____

Remarks:

FAC Neutral Test (FACW+OBL:FACU, UPL): 2:0

SOIL

Sampling Point: 1A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 3/2	99	7.5 YR 5/6	1	C	M	Clay	
3-9	GLEY 1 4/N	98	7.5 YR 5/6	2	C	M	Clay	
9-16	10YR 4/2	98	7.5 YR 5/6	2	C	M	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- X Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- X Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): _____

Water Table Present? Yes ____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 4

Wetland Hydrology Present? **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Lookout Solar City/County: Oglala Lakota County Sampling Date: 06/12/2018

Applicant/Owner: Lookout Solar, LLC State: SD Sampling Point: 1B

Investigator(s): ES, SJ Section, Township, Range: Section 36, Township 41N, Range 48W

Landform (hillslope, terrace, etc.): Closed depression Local relief (concave, convex, none): Concave Slope (%): 0-1

Subregion (LRR): G Lat: 43.48799064 Long: -102.9811759 Datum: NAD_1983

Soil Map Unit Name: Richfield-Altvan silt loams, 0 to 3 percent slopes NWI classification: Palustrine Emergent

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No X	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Elymus trachycaulus	40	Yes	FACU
2. Eleocharis palustris	30	Yes	OBL
3. Bromus inermis	3	No	UPL
4. Poa secunda	2	No	FACU
5. Alopecurus aequalis	2	No	OBL
6. Grindelia squarrosa	2	No	UPL
7.			
8.			
9.			
10.			
	79 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 21

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	32	x 1 =	32
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	42	x 4 =	168
UPL species	5	x 5 =	25
Column Totals:	79 (A)		225 (B)

Prevalence Index = B/A = 2.85

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks:

FAC Neutral Test (FACW+OBL:FACU+UPL): 2:4

Prevalence Index indicator is not applicable, as wetland hydrology and hydric soil indicators are absent.

SOIL

Sampling Point: 1B

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-3	10YR 3/2	99	7.5 YR 4/6	1	C	M	Clay	
3-16	10YR 3/1	100					Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Lookout Solar City/County: Oglala Lakota County Sampling Date: 06/12/2018

Applicant/Owner: Lookout Solar, LLC State: SD Sampling Point: 2A

Investigator(s): ES, SJ Section, Township, Range: Section 36, Township 41N, Range 48W

Landform (hillslope, terrace, etc.): Closed depression Local relief (concave, convex, none): Concave Slope (%): 0-1

Subregion (LRR): G Lat: 43.48755728 Long: -102.9820072 Datum: NAD_1983

Soil Map Unit Name: Richfield-Altvan silt loams, 0 to 3 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** **Yes** X **No** _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Eleocharis palustris	90	Yes	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	90 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 10

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** _____

Remarks:

FAC Neutral Test (FACW+OBL:FACU, UPL): 1:0

SOIL

Sampling Point: 2A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 3/3	100					--	organic, fibrous roots
1-10	10YR 4/1	90	5 YR 5/6	10	C	M	Silty Clay	
10-16	10YR 4.5/2	100					Silty Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- X Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:
0-1" layer contains high concentrations of organic material

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- X Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** X **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Saturation was noted in the immediate area surrounding the sample point.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Lookout Solar City/County: Oglala Lakota County Sampling Date: 06/12/2018

Applicant/Owner: Lookout Solar, LLC State: SD Sampling Point: 2B

Investigator(s): ES, SJ Section, Township, Range: Section 36, Township 41N, Range 48W

Landform (hillslope, terrace, etc.): Closed depression Local relief (concave, convex, none): Concave Slope (%): 0-1

Subregion (LRR): G Lat: 43.48754523 Long: -102.981946 Datum: NAD_1983

Soil Map Unit Name: Richfield-Altvan silt loams, 0 to 3 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No X	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Elymus trachycaulus	40	Yes	FACU
2. Bromus inermis	40	Yes	UPL
3. Poa secunda	15	No	FACU
4. Tragopogon dubius	1	No	UPL
5. Grindelia squarrosa	2	No	UPL
6.			
7.			
8.			
9.			
10.			
	98 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 2

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** _____ **No** X

Remarks:

FAC Neutral Test (FACW+OBL:FACU+UPL): 0:5

Prevalence Index indicator is not applicable, as wetland hydrology and hydric soil indicators are absent.

SOIL

Sampling Point: 2B

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/1	98	7.5 YR 4/6	2	C	M	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Lookout Solar City/County: Oglala Lakota County Sampling Date: 06/12/2018

Applicant/Owner: Lookout Solar, LLC State: SD Sampling Point: 3

Investigator(s): ES, SJ Section, Township, Range: Section 36, Township 41N, Range 48W

Landform (hillslope, terrace, etc.): Semi-closed depression Local relief (concave, convex, none): Concave Slope (%): 0-1

Subregion (LRR): G Lat: 43.48673869 Long: -102.9768773 Datum: NAD_1983

Soil Map Unit Name: Richfield-Altvan silt loams, 0 to 3 percent slopes NWI classification: Palustrine Emergent

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____ No X	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Eleocharis palustris	40	Yes	OBL
2. Alopecurus aequalis	40	Yes	OBL
3. Bromus inermis	2	No	UPL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	82 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 18

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

FAC Neutral Test (FACW+OBL:FACU, UPL): 2:0

SOIL

Sampling Point: 3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2	95	10YR 6/6	5	C	M	Clay	fibrous roots
1-10	10YR 3/2	95	10YR 6/6	5	C	M	Clay	no roots
10-16	10YR 3/3	100					Clay	faint redox present

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- X Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** X **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Sample point was collected from the lowest point within the surrounding isolated depression.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Lookout Solar City/County: Oglala Lakota County Sampling Date: 06/12/2018

Applicant/Owner: Lookout Solar, LLC State: SD Sampling Point: 4A

Investigator(s): ES, SJ Section, Township, Range: Section 36, Township 41N, Range 48W

Landform (hillslope, terrace, etc.): Semi-closed depression Local relief (concave, convex, none): Concave Slope (%): 0-1

Subregion (LRR): G Lat: 43.48529217 Long: -102.985856 Datum: NAD_1983

Soil Map Unit Name: Richfield-Altvan silt loams, 0 to 3 percent slopes NWI classification: Freshwater Pond

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** **Yes** X **No** _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Eleocharis palustris	30	Yes	OBL
2. Sagittaria rigida	20	Yes	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	50 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 50

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** _____

Remarks:

FAC Neutral Test (FACW+OBL:FACU, UPL): 2:0

SOIL

Sampling Point: 4A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 4/1	90	10YR 5/6	10	C	M	Loamy Clay	
4-7	GLEY 1 4/N	98	10YR 5/6	2	C	M	Clay	
7-16	2.5 YR 4/2	100					Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- X Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- X Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Surface water located approximately three feet from the sample point.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Lookout Solar City/County: Oglala Lakota County Sampling Date: 06/12/2018

Applicant/Owner: Lookout Solar, LLC State: SD Sampling Point: 4B

Investigator(s): ES, SJ Section, Township, Range: Section 36, Township 41N, Range 48W

Landform (hillslope, terrace, etc.): Semi-closed depression Local relief (concave, convex, none): Concave Slope (%): 0-1

Subregion (LRR): G Lat: 43.48533941 Long: -102.9857853 Datum: NAD_1983

Soil Map Unit Name: Richfield-Altvan silt loams, 0 to 3 percent slopes NWI classification: Freshwater Pond

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No X	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Elymus trachycaulus	30	Yes	FACU
2. Eleocharis palustris	20	Yes	OBL
3. Alopecurus aequalis	10	No	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	60 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 40

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks:

FAC Neutral Test (FACW+OBL:FACU+UPL): 2:1

Prevalence Index indicator is not applicable, as wetland soil indicators are absent.

SOIL

Sampling Point: 4B

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 3/2	90	7.5YR 3/8	10	C	M	Clay	
2-13	10YR 4/3	98	10YR 6/6	2	C	M	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** X **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Two secondary indicators present

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Lookout Solar City/County: Oglala Lakota County Sampling Date: 06/12/2018

Applicant/Owner: Lookout Solar, LLC State: SD Sampling Point: 5

Investigator(s): ES, SJ Section, Township, Range: Section 36, Township 41N, Range 48W

Landform (hillslope, terrace, etc.): Closed depression Local relief (concave, convex, none): Concave Slope (%): 0

Subregion (LRR): G Lat: 43.48308004 Long: -102.97693 Datum: NAD_1983

Soil Map Unit Name: Richfield-Altvan silt loams, 0 to 3 percent slopes NWI classification: Palustrine Emergent

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____ No X	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Eleocharis palustris	30	Yes	OBL
2. Alopecurus aequalis	20	Yes	OBL
3. Juncus interior	10	No	FACW
4. Elymus trachycaulus	15	No	UPL
5. Eleocharis acicularis	15	No	OBL
6.			
7.			
8.			
9.			
10.			
	90 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 10

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

FAC Neutral Test (FACW+OBL:FACU, UPL): 4:1

SOIL

Sampling Point: 5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 3/2	97	7.5YR 4/6	3	C	M	Clay	
5-14	10YR 2/2	99	7.5YR 4/6	1	C	M, PL	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- X Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** X **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

A small number of mollusks present (1-2mm in length).

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Lookout Solar City/County: Oglala Lakota County Sampling Date: 06/12/2018

Applicant/Owner: Lookout Solar, LLC State: SD Sampling Point: 6A

Investigator(s): ES, SJ Section, Township, Range: Section 36, Township 41N, Range 48W

Landform (hillslope, terrace, etc.): Semi-closed depression Local relief (concave, convex, none): Concave Slope (%): 0-1

Subregion (LRR): G Lat: 43.48009874 Long: -102.9739746 Datum: NAD_1983

Soil Map Unit Name: Richfield-Altvan silt loams, 0 to 3 percent slopes NWI classification: Palustrine Emergent

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** **Yes** X **No** _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Eleocharis palustris	80	Yes	OBL
2. Alopecurus aequalis	10	No	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	90 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 10

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** _____

Remarks:

FAC Neutral Test (FACW+OBL:FACU, UPL): 2:0

SOIL

Sampling Point: 6A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2	95	7.5YR 6/6	5	C	PL	Clay	
4-10	10YR 4/1	95	7.5YR 4/6	5	C	M, PL	Clay	
10-16	10YR 4/2	80	7.5YR 4/6	20	C	M	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- X Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:
Dark manganese concentrations in the top 10".

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- X Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- X Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** X **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Lookout Solar City/County: Oglala Lakota County Sampling Date: 06/12/2018

Applicant/Owner: Lookout Solar, LLC State: SD Sampling Point: 6B

Investigator(s): ES, SJ Section, Township, Range: Section 36, Township 41N, Range 48W

Landform (hillslope, terrace, etc.): Semi-closed depression Local relief (concave, convex, none): Concave Slope (%): 0-1

Subregion (LRR): G Lat: 43.48012212 Long: -102.973847 Datum: NAD_1983

Soil Map Unit Name: Richfield-Altvan silt loams, 0 to 3 percent slopes NWI classification: Palustrine Emergent

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No X	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Elymus trachycaulus	45	Yes	FACU
2. Alopecurus aequalis	45	Yes	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	90 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 10

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks:

FAC Neutral Test (FACW+OBL:FACU+UPL): 1:1

Prevalence Index indicator is not applicable, as hydric soil indicators are absent.

SOIL

Sampling Point: 6B

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 3/2	99	7.5YR 5/6	1	C	M	Loamy Clay	organic matter present
3-12	10YR 3/2	98	7.5YR 5/6	2	C	PL	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** X **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Lookout Solar City/County: Custer County Sampling Date: 06/12/2018

Applicant/Owner: Lookout Solar, LLC State: SD Sampling Point: 7A

Investigator(s): ES, SJ Section, Township, Range: Section 29, Township 6S, Range 9E

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Concave Slope (%): 0-1

Subregion (LRR): G Lat: 43.50186308 Long: -103.0747139 Datum: NAD_1983

Soil Map Unit Name: Bankard loamy fine sand, 0 to 4 percent slopes NWI classification: Forested/Shrub Wetland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Salix exigua	70	Yes	FACW
2. Populus deltoides	10	No	FAC
3.			
4.			
5.			
	80 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Asclepias speciosa	10	Yes	FAC
2. Sagittaria rigida	10	Yes	OBL
3. Spartina pectinata	20	Yes	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	40 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 60

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

FAC Neutral Test (FACW+OBL:FACU, UPL): 3:0

SOIL

Sampling Point: 7A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-3	2.5YR 3/2	100					Silty Clay	
3-4	2.5YR 3/2	100					Sandy Clay	
4-8	GLEY 1 3/10Y	99	10YR 6/6	1	C	M	Clay	
8-16	GLEY 1 4/N	70	7.5YR 4/6	30	C	M	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- X Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:
High concentration of cobbles in the surrounding area, near the bridge.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- X Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** X **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Lookout Solar City/County: Custer County Sampling Date: 06/12/2018

Applicant/Owner: Lookout Solar, LLC State: SD Sampling Point: 7B

Investigator(s): ES, SJ Section, Township, Range: Section 29, Township 6S, Range 9E

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): None Slope (%): 0-1

Subregion (LRR): G Lat: 43.50156353 Long: -103.0744884 Datum: NAD_1983

Soil Map Unit Name: Bankard loamy fine sand, 0 to 4 percent slopes NWI classification: Riverine

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** **Yes** X **No** _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Typha angustifolia	70	Yes	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	70 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 30

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** _____

Remarks:

FAC Neutral Test (FACW+OBL:FACU+UPL): 1:0

SOIL

Sampling Point: 7B

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 2/1						Mucky	Organic matter present
1-8	7.5YR 4/1	80	5YR 5/8	20	C	M	Loamy Clay	
8-16	10YR 4/1	90	10YR 5/8	10	C	M	Loamy	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- X Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Lookout Solar City/County: Custer County Sampling Date: 06/12/2018

Applicant/Owner: Lookout Solar, LLC State: SD Sampling Point: 7C

Investigator(s): ES, SJ Section, Township, Range: Section 29, Township 6S, Range 9E

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Concave Slope (%): 5

Subregion (LRR): G Lat: 43.50154446 Long: -103.0742299 Datum: NAD_1983

Soil Map Unit Name: Bankard loamy fine sand, 0 to 4 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. Elaeagnus angustifolia	5	No	FACU
2. Salix exigua	2	No	FACW
3. Populus deltoides	20	Yes	FAC
4.			
5.			
	27	= Total Cover	
Herb Stratum (Plot size: 5')			
1. Elymus trachycaulus	20	Yes	FACU
2. Alopecurus aequalis	3	No	OBL
3. Pascopyrum smithii	5	No	FACU
4. Grindelia squarrosa	1	No	UPL
5. Monolepis nuttalliana	20	Yes	FAC
6. Rumex crispus	2	No	FAC
7. Glycyrrhiza lepidota	2	No	FACU
8. Melilotus officinalis	1	No	FACU
9. Bromus inermis	10	No	UPL
10. Spartina pectinata	2	No	FACW
	66	= Total Cover	
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 34

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

FAC Neutral Test (FACW+OBL:FACU+UPL): 2:7

SOIL

Sampling Point: 7C

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 4/3	95	7.5YR 4/6	5	C	M	Sandy Loam	fine sand

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** X

Remarks:
Due to landform, indicator F8 is not applicable.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Lookout Solar City/County: Custer County Sampling Date: 06/12/2018

Applicant/Owner: Lookout Solar, LLC State: SD Sampling Point: 8A

Investigator(s): ES, SJ Section, Township, Range: Section 29, Township 6S, Range 9E

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR): G Lat: 43.50212875 Long: -103.0749194 Datum: NAD_1983

Soil Map Unit Name: Bankard loamy fine sand, 0 to 4 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. Salix exigua	40	Yes	FACW
2.			
3.			
4.			
5.			
	40	= Total Cover	
Herb Stratum (Plot size: 5')			
1. Eleocharis acicularis	20	Yes	OBL
2. Typha angustifolia	60	Yes	OBL
3. Spartina pectinata	5	No	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	85	= Total Cover	
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 15

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

FAC Neutral Test (FACW+OBL:FACU, UPL): 4:0

SOIL

Sampling Point: 8A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 4/1	95	7.5YR 5/6	5	C	M	Clay	Slightly mucky with organic material
3-16	10YR 5/1	85	7.5YR 5/6	15	C	M	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- X Sediment Deposits (B2)
- X Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- X Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- X Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): 1

Water Table Present? Yes X No ____ Depth (inches): 1

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Lookout Solar City/County: Custer County Sampling Date: 06/12/2018

Applicant/Owner: Lookout Solar, LLC State: SD Sampling Point: 8B

Investigator(s): ES, SJ Section, Township, Range: Section 29, Township 6S, Range 9E

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): None Slope (%): 2

Subregion (LRR): G Lat: 43.50219892 Long: -103.0750727 Datum: NAD_1983

Soil Map Unit Name: Bankard loamy fine sand, 0 to 4 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No X	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. Elaeagnus angustifolia	10	Yes	FACU
2. Populus deltoides	5	Yes	FAC
3.			
4.			
5.			
	15	= Total Cover	
Herb Stratum (Plot size: 5')			
1. Elymus trachycaulus	2	No	FACU
2. Bromus arvensis	30	Yes	FACU
3. Bromus inermis	10	No	UPL
4. Agropyron cristatum	5	No	UPL
5. Pascopyrum smithii	10	No	FACU
6. Rumex crispus	3	No	FAC
7. Lepidium densiflorum	5	No	FAC
8. Melilotus officinalis	2	No	FACU
9. Bromus tectorum	15	Yes	UPL
10. Hordeum jubatum	2	No	FACW
	84	= Total Cover	
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 16

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 1 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks:

FAC Neutral Test (FACW+OBL:FACU+UPL): 1:8

Prevalence Index indicator is not applicable, as hydric soil indicators are absent.

SOIL

Sampling Point: 8B

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/2	98	5YR 4/6	2	C	M	Clay	small amount of sand
8-16	10YR 3/2	98	5YR 4/6	2	C	M	Sandy Clay	coarse sand increases with depth, sandy at 16"

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** X **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Lookout Solar City/County: Custer County Sampling Date: 06/14/2018

Applicant/Owner: Lookout Solar, LLC State: SD Sampling Point: 8C

Investigator(s): ES, SJ Section, Township, Range: Section 29, Township 6S, Range 9E

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): 3

Subregion (LRR): G Lat: 43.502201227 Long: -103.075186629 Datum: NAD_1983

Soil Map Unit Name: Bankard loamy fine sand, 0 to 4 percent slopes NWI classification: Forested/Shrub Wetland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No X	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____ No X	
Wetland Hydrology Present?	Yes _____ No X	

Remarks:

Disturbed area adjacent to bridge; weedy.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Elaeagnus angustifolia	5	Yes	FACU
2. Populus deltoides	5	Yes	FAC
3.			
4.			
5.			
	10 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Pascopyrum smithii	10	Yes	FACU
2. Bromus tectorum	10	Yes	UPL
3. Rumex crispus	3	No	FAC
4. Hordeum jubatum	3	No	FACW
5. Cirsium arvense	4	No	FACU
6. Agropyron cristatum	20	Yes	UPL
7. Bromus inermis	5	No	UPL
8. Melilotus officinalis	2	No	FACU
9.			
10.			
	57 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 43

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 1 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 20 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks:

FAC Neutral Test (FACW+OBL:FACU+UPL): 1:7

Prevalence Index indicator is not applicable, as wetland soil and hydrology indicators are absent.

SOIL

Sampling Point: 8C

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/2	99	7.5YR 5/6	1	C	M	Loamy Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Lookout Solar City/County: Custer County Sampling Date: 06/13/2018

Applicant/Owner: Lookout Solar, LLC State: SD Sampling Point: 9A

Investigator(s): ES, SJ Section, Township, Range: Section 13, Township 6S, Range 8E

Landform (hillslope, terrace, etc.): Semi-closed depression Local relief (concave, convex, none): Concave Slope (%): 0

Subregion (LRR): G Lat: 43.52490956 Long: -103.1047976 Datum: NAD_1983

Soil Map Unit Name: Lohmiller silty clay loam NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

Low area along roadside ditch/wetland. Strong hydric soil indicators.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5')			
1. Alopecurus aequalis	10	No	OBL
2. Typha angustifolia	80	Yes	OBL
3. Bromus inermis	5	No	UPL
4. Chenopodium album	2	No	FACU
5.			
6.			
7.			
8.			
9.			
10.			
	97 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 3

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

FAC Neutral Test (FACW+OBL:FACU, UPL): 2:2

SOIL

Sampling Point: 9A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 2/2	100					Loamy clay	fibrous roots
3-10	10YR 3/1	90	7.5YR 4/6	10	C	M	Clay	small, white mottles
10-20	10YR 4/1	70	7.5YR 4/6	30	C	M	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:
Due to landform, indicator F8 is not applicable.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- X Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): 12

Wetland Hydrology Present? **Yes** X **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Lookout Solar City/County: Custer County Sampling Date: 06/13/2018

Applicant/Owner: Lookout Solar, LLC State: SD Sampling Point: 9B

Investigator(s): ES, SJ Section, Township, Range: Section 13, Township 6S, Range 8E

Landform (hillslope, terrace, etc.): Semi-closed depression Local relief (concave, convex, none): None Slope (%): 0-1

Subregion (LRR): G Lat: 43.5251606 Long: -103.104815 Datum: NAD_1983

Soil Map Unit Name: Lohmiller silty clay loam NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No X	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5')			
1. Elymus trachycaulus	30	Yes	FACU
2. Lactuca serriola	2	No	FAC
3. Bromus inermis	30	Yes	UPL
4. Chenopodium album	2	No	FACU
5. Pascopyrum smithii	30	Yes	FACU
6. Spartina pectinata	6	No	FACW
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 16

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	6	x 2 =	12
FAC species	2	x 3 =	6
FACU species	62	x 4 =	248
UPL species	30	x 5 =	150
Column Totals:	100 (A)		416 (B)

Prevalence Index = B/A = 4.16

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks:

FAC Neutral Test (FACW+OBL:FACU+UPL): 1:4

SOIL

Sampling Point: 9B

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 2/2	100					Loamy Clay	
3-12	10YR 3/2	60	7.5YR 3/4	40	C	M	Clay	
12-16	GLEY 1 4/N	70	7.5YR 5/6	30	C	M	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- X Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:
Borderline loamy gleyed matrix; gley begins at 12"

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- X Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** X **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Lookout Solar City/County: Custer County Sampling Date: 06/13/2018

Applicant/Owner: Lookout Solar, LLC State: SD Sampling Point: 10A

Investigator(s): ES, SJ Section, Township, Range: Section 13, Township 6S, Range 8E

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 3

Subregion (LRR): G Lat: 43.52683305 Long: -103.1047978 Datum: NAD_1983

Soil Map Unit Name: Lohmiller silty clay loam NWI classification: Palustrine Emergent

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

Low area along roadside ditch/wetland. Strong hydric soil indicators.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5')			
1. Schoenoplectus sp.	10	No	OBL
2. Typha angustifolia	80	Yes	OBL
3. Eleocharis palustris	5	No	OBL
4. Tradescantia occidentalis	5	No	UPL
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

FAC Neutral Test (FACW+OBL:FACU, UPL): 3:0

SOIL

Sampling Point: 10A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR 4/3	100					Sandy clay	
7-10	GLEY 1 3/N	90	7.5YR 4/6	10	C	M	Loamy clay	
10-16	GLEY 1 5/N	98	7.5YR 4/6	2	C	M	Loamy clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- X Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): _____

Water Table Present? Yes X No ____ Depth (inches): 8

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Lookout Solar City/County: Custer County Sampling Date: 06/13/2018

Applicant/Owner: Lookout Solar, LLC State: SD Sampling Point: 10B

Investigator(s): ES, SJ Section, Township, Range: Section 13, Township 6S, Range 8E

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None Slope (%): 2

Subregion (LRR): G Lat: 43.52692761 Long: -103.1047716 Datum: NAD_1983

Soil Map Unit Name: Lohmiller silty clay loam NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No X	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5')			
1. Sisybrium altissimum	1	No	UPL
2. Lepidium densiflorum	5	No	FAC
3. Bromus inermis	40	Yes	UPL
4. Hordeum jubatum	5	No	FACW
5. Pascopyrum smithii	5	No	FACU
6. Spartina pectinata	10	Yes	FACW
7.			
8.			
9.			
10.			
	66 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 34

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	15	x 2 =	30
FAC species	5	x 3 =	15
FACU species	5	x 4 =	20
UPL species	41	x 5 =	205
Column Totals:	66 (A)		270 (B)

Prevalence Index = B/A = 4.10

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks:

FAC Neutral Test (FACW+OBL:FACU+UPL): 2:3

SOIL

Sampling Point: 10B

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 4/3	100					Sandy loam	Coarse sand
4-16	10YR 4/1	85	7.5YR 5/4	15	C	PL	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- X Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:
Coarse sand grains present in the top layer.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- X Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** X **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Lookout Solar City/County: Custer County Sampling Date: 06/13/2018

Applicant/Owner: Lookout Solar, LLC State: SD Sampling Point: 11A

Investigator(s): ES, SJ Section, Township, Range: Section 18, Township 6S, Range 9E

Landform (hillslope, terrace, etc.): Semi-closed depression Local relief (concave, convex, none): Concave Slope (%): 0-1

Subregion (LRR): G Lat: 43.52672513 Long: -103.1046425 Datum: NAD_1983

Soil Map Unit Name: Lohmiller silty clay loam NWI classification: Forested/Shrub Wetland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

Low area along roadside ditch/wetland. Strong hydric soil indicators.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Populus angustifolia	5	Yes	FACW
2.			
3.			
4.			
	5 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Acer negundo	5	Yes	FAC
2.			
3.			
4.			
5.			
	5 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Asclepias speciosa	1	No	FAC
2. Typha angustifolia	90	Yes	OBL
3. Bromus inermis	9	No	UPL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

FAC Neutral Test (FACW+OBL:FACU, UPL): 2:1

SOIL

Sampling Point: 11A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 3/2	95	7.5YR 4/6	5	C	PL	Loamy clay	
3-10	10YR 5/1	85	5YR 5/6	15	C	M	Clay	
10-16	GLEY 1 5/N	90	7.5YR 4/6	10	C	M	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- X Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- X Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- X Drift Deposits (B3)
- X Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- X Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes X No _____ Depth (inches): 11

Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Lookout Solar City/County: Custer County Sampling Date: 06/13/2018

Applicant/Owner: Lookout Solar, LLC State: SD Sampling Point: 11B

Investigator(s): ES, SJ Section, Township, Range: Section 18, Township 6S, Range 9E

Landform (hillslope, terrace, etc.): Semi-closed depression Local relief (concave, convex, none): Concave Slope (%): 0-1

Subregion (LRR): G Lat: 43.52713371 Long: -103.1046423 Datum: NAD_1983

Soil Map Unit Name: Lohmiller silty clay loam NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No X	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Populus angustifolia	5	Yes	FACW
2.			
3.			
4.			
	5 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5')			
1. Bromus inermis	90	Yes	UPL
2. Poa secunda	10	No	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks:

FAC Neutral Test (FACW+OBL:FACU+UPL): 1:2

Prevalence Index indicator is not applicable, as wetland hydrology indicators are absent.

SOIL

Sampling Point: 11B

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 3/2	98	10YR 5/6	2	C	M	Loamy clay	
5-16	10YR 4/1	90	10YR 5/6	10	C	M	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- X Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Lookout Solar City/County: Custer County Sampling Date: 06/13/2018

Applicant/Owner: Lookout Solar, LLC State: SD Sampling Point: 12A

Investigator(s): ES, SJ Section, Township, Range: Section 18, Township 6S, Range 9E

Landform (hillslope, terrace, etc.): Semi-closed depression Local relief (concave, convex, none): Concave Slope (%): 0-1

Subregion (LRR): G Lat: 43.52483137 Long: -103.1046407 Datum: NAD_1983

Soil Map Unit Name: Lohmiller silty clay loam NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** **Yes** X **No** _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

Low area along roadside ditch/wetland. Strong hydric soil indicators.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	5 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	5 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Typha angustifolia	45	Yes	OBL
2. Alopecurus aequalis	45	Yes	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	90 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 10

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** _____

Remarks:

FAC Neutral Test (FACW+OBL:FACU, UPL): 2:0

SOIL

Sampling Point: 12A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 3/2	99	10YR 4/6	1	C	M	Loamy clay	fibrous roots
5-16	GLEY 1 4/N	97	10YR 4/6	3	C	M	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- X Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- X Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- X Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- X Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): 9

Wetland Hydrology Present? **Yes** X **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Lookout Solar City/County: Custer County Sampling Date: 06/13/2018

Applicant/Owner: Lookout Solar, LLC State: SD Sampling Point: 12B

Investigator(s): ES, SJ Section, Township, Range: Section 18, Township 6S, Range 9E

Landform (hillslope, terrace, etc.): Semi-closed depression Local relief (concave, convex, none): Concave Slope (%): 0-1

Subregion (LRR): G Lat: 43.52460758 Long: -103.104642 Datum: NAD_1983

Soil Map Unit Name: Lohmiller silty clay loam NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No X	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer negundo	5	Yes	FAC
2.			
3.			
4.			
	5 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. Bromus inermis	90	Yes	UPL
2. Cirsium undulatum	2	No	FACU
3. Tragopogon dubius	2	No	UPL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	94 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 6

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** _____ **No** X

Remarks:

FAC Neutral Test (FACW+OBL:FACU+UPL): 0:3

Prevalence Index indicator is not applicable, as hydric soil and wetland hydrology indicators are absent.

SOIL

Sampling Point: 12B

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-4	10YR 3/2	100					Loamy	
4-16	10YR 3/2	100					Sandy clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Lookout Solar City/County: Custer County Sampling Date: 06/13/2018

Applicant/Owner: Lookout Solar, LLC State: SD Sampling Point: 13

Investigator(s): ES, SJ Section, Township, Range: Section 18, Township 6S, Range 9E

Landform (hillslope, terrace, etc.): Berm Local relief (concave, convex, none): convex Slope (%): 0

Subregion (LRR): G Lat: 43.52555058 Long: -103.1046211 Datum: NAD_1983

Soil Map Unit Name: Lohmiller silty clay loam NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No X	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** X
Hydric Soil Present?	Yes _____ No X	
Wetland Hydrology Present?	Yes _____ No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Bromus inermis	97	Yes	UPL
2. Equisetum sp.	3	No	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** _____ **No** X

Remarks:

FAC Neutral Test (FACW+OBL:FACU, UPL): 0:1

Prevalence Index indicator is not applicable, as hydric soil and wetland hydrology indicators are absent.

SOIL

Sampling Point: 13

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/3	100					Loam	fibrous; gravel present
6-16	10YR 4/2	99	7.5YR 5/6	1	C	M	Clay	white mottles present

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** X

Remarks:
Redox features are not prominent or distinct, and thus does not qualify as Depleted Matrix (F3).

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Lookout Solar City/County: Custer County Sampling Date: 06/13/2018

Applicant/Owner: Lookout Solar, LLC State: SD Sampling Point: 14

Investigator(s): ES, SJ Section, Township, Range: Section 12, Township 6S, Range 8E

Landform (hillslope, terrace, etc.): Semi-closed depression Local relief (concave, convex, none): Concave Slope (%): 0-1

Subregion (LRR): G Lat: 43.53488482 Long: -103.1221669 Datum: NAD_1983

Soil Map Unit Name: Pierre clay, 2 to 6 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes X	No _____	

Remarks: This sample was borderline wetland, but lacked hydric soil indicators. Indicator F8 is not applicable to semi-closed depressions.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	5	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	5	= Total Cover	
Herb Stratum (Plot size: 5')			
1. Eleocharis palustris	60	Yes	OBL
2. Rumex crispus	5	No	FAC
3. Poa secunda	5	No	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	70	= Total Cover	
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 30

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** _____

Remarks:

FAC Neutral Test (FACW+OBL:FACU, UPL): 1:1

SOIL

Sampling Point: 14

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 4/3	95	7.5YR 5/8	5	C	M	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

Mottles of GLEY 1 5/N comprise approximately 30% of the matrix color.

This location was not identified as a potential wetland by the US Fish and Wildlife NWI database. The location was assessed to determine if indicators are currently present. The sample was borderline, but lacked hydric soil indicators. Due to the landform, indicator F8 is not applicable.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): 5

Wetland Hydrology Present? **Yes** X **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Surface water is present approximately two feet from the sample point.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Lookout Solar City/County: Custer County Sampling Date: 06/13/2018

Applicant/Owner: Lookout Solar, LLC State: SD Sampling Point: 15A

Investigator(s): ES, SJ Section, Township, Range: Section 12, Township 6S, Range 8E

Landform (hillslope, terrace, etc.): Semi-closed depression Local relief (concave, convex, none): Concave Slope (%): 0-1

Subregion (LRR): G Lat: 43.53488131 Long: -103.1240862 Datum: NAD_1983

Soil Map Unit Name: Lohmiller silty clay loam NWI classification: Palustrine Emergent

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** **Yes** X **No** _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Salix fragilis	5	Yes	UPL
2.			
3.			
4.			
5.			
	5 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Rumex crispus	5	No	FAC
2. Eleocharis palustris	10	No	OBL
3. Hordeum jubatum	5	No	FACW
4. Spartina pectinata	30	Yes	FACW
5. Sagittaria latifolia	1	No	OBL
6.			
7.			
8.			
9.			
10.			
	51 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 49

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	11	x 1 =	11
FACW species	35	x 2 =	70
FAC species	0	x 3 =	0
FACU species	5	x 4 =	20
UPL species	5	x 5 =	25
Column Totals:	56 (A)		126 (B)

Prevalence Index = B/A = 2.25

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** _____

Remarks:

FAC Neutral Test (FACW+OBL:FACU+UPL): 4:1

SOIL

Sampling Point: 15A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-10	GLEY 1 4/N	80	5YR 4/6	20	C	M, PL	Clay	
10-16	GLEY 1 4/N	20	5YR 4/6	40	C	M, PL	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- X Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- X Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- X Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** X **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Lookout Solar City/County: Custer County Sampling Date: 06/13/2018

Applicant/Owner: Lookout Solar, LLC State: SD Sampling Point: 15B

Investigator(s): ES, SJ Section, Township, Range: Section 12, Township 6S, Range 8E

Landform (hillslope, terrace, etc.): Semi-closed depression Local relief (concave, convex, none): Concave Slope (%): 0-1

Subregion (LRR): G Lat: 43.53486775 Long: -103.1242106 Datum: NAD_1983

Soil Map Unit Name: Lohmiller silty clay loam NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No X	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** X
Hydric Soil Present?	Yes _____ No X	
Wetland Hydrology Present?	Yes _____ No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5')			
1. Bromus inermis	20	Yes	UPL
2. Elymus trachycaulus	30	Yes	FACU
3. Poa secunda	25	Yes	FACU
4. Agropyron cristatum	10	No	UPL
5. Spartina pectinata	15	No	FACW
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** _____ **No** X

Remarks:

FAC Neutral Test (FACW+OBL:FACU+UPL): 1:4

Prevalence Index indicator is not applicable, as hydric soil and wetland hydrology indicators are absent.

SOIL

Sampling Point: 15B

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-16	10YR 3/2	100					Loamy clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Lookout Solar City/County: Custer County Sampling Date: 06/13/2018

Applicant/Owner: Lookout Solar, LLC State: SD Sampling Point: 16

Investigator(s): ES, SJ Section, Township, Range: Section 15, Township 6S, Range 8E

Landform (hillslope, terrace, etc.): Semi-closed depression Local relief (concave, convex, none): Concave Slope (%): 0-1

Subregion (LRR): G Lat: 43.53299205 Long: -103.1467908 Datum: NAD_1983

Soil Map Unit Name: Lohmiller silty clay, channeled, 0 to 3 percent slopes, occasionally flooded NWI classification: Palustrine Emergent

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No X	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5')			
1. Cirsium arvense	20	Yes	FACU
2. Poa secunda	30	Yes	FACU
3. Melilotus officinalis	1	No	FACU
4. Lepidium densiflorum	4	No	FAC
5. Convolvulus arvensis	5	No	UPL
6. Pascopyrum smithii	10	No	FACU
7. Helianthus petiolaris	1	No	UPL
8. Bromus inermis	20	Yes	UPL
9.			
10.			
	91 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 9

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks:

FAC Neutral Test (FACW+OBL:FACU+UPL): 0:7

Prevalence Index indicator is not applicable, as wetland hydrology indicators are absent.

SOIL

Sampling Point: 16

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2	100					Clay	
4-8	10YR 3/1	98	7.5YR 4/6	2	C	M	Clay	
8-16	GLEY 1 4/N	70	10YR 4/6	30	C	M, PL	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- X Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX B

PHOTOGRAPH LOG

APPENDIX B. PHOTOGRAPH LOG
LOOKOUT SOLAR, LLC., CUSTER AND OGLALA LAKOTA COUNTIES, SOUTH DAKOTA

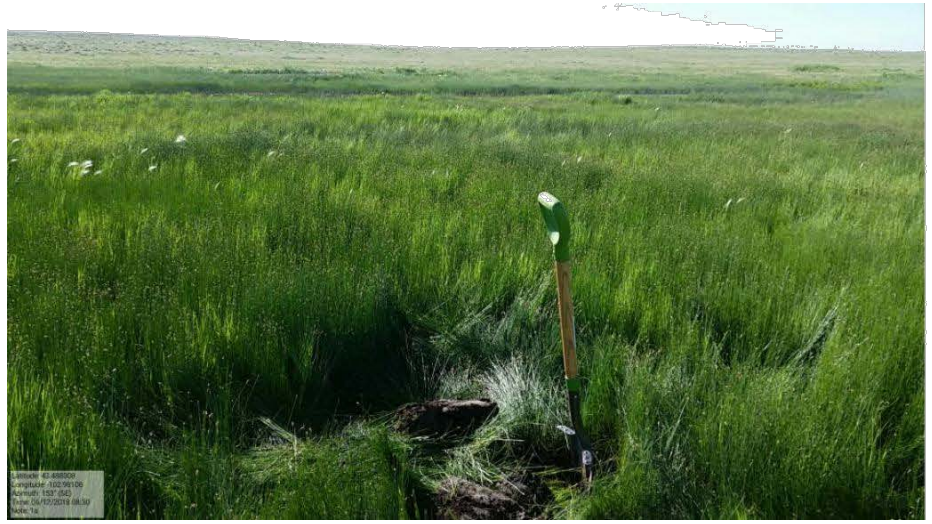

Photo 1. Sample Point 1A

Photo 2. Sample Point 1B

Photo 3. Sample Point 2A

Photo 4. Sample Point 2B

Photo 5. Sample Point 3

Photo 6. Sample Point 3

Photo 7. Sample Point 4A

Photo 8. Sample Point 4B

Photo 9. Sample Point 5

Photo 10. Sample Point 5

Photo 11. Sample Point 6A

Photo 12. Sample Point 6B

Photo 13. Sample Point 7A

Photo 14. Sample Point 7A

Photo 15. Sample Point 7B

Photo 16. Sample Point 7C

Photo 17. Sample Point 8A

Photo 18. Sample Point 8A

Photo 19. Sample Point 8B

Photo 20. Sample Point 8B

Photo 21. Sample Point 9A

Photo 22. Sample Point 9B

Photo 23. Sample Point 10B

Photo 24. Sample Point 10B

Photo 25. Sample Point 11A

Photo 26. Sample Point 11B

Photo 27. Sample Point 12A

Photo 28. Sample Point 12B

Photo 29. Sample Point 13

Photo 30. Sample Point 13

Photo 31. Sample Point 14

Photo 32. Sample Point 14

Photo 33. Sample Point 15A

Photo 34. Sample Point 15B

Photo 35. Sample Point 16

Photo 36. Sample Point 16

Photo 37. Cheyenne River Crossing, North of bridge

Photo 38. Cheyenne River Crossing, South of bridge

Photo 39. Angostura Canal Crossing

Photo 40. Angostura Canal Crossing

Photo 41. Cottonwood Creek Crossing

Appendix C: Biological Resources Inventory Report

BIOLOGICAL RESOURCE REPORT

LOOKOUT SOLAR PROJECT

CUSTER AND OGLALA LAKOTA COUNTIES, SOUTH DAKOTA

July 31, 2018

Project #: 52V-001-001

SUBMITTED BY: Trihydro Corporation

1252 Commerce Drive, Laramie, WY 82070

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1.0 INTRODUCTION

1.1 PROJECT DESCRIPTION

The Project proponent (Wirsol) proposes to construct and operate an approximately 840-acre photovoltaic (PV) solar farm and an information and office center on the Pine Ridge Indian Reservation. The solar farm will connect to an approximately 10-acre substation (to be constructed) via a 9-mile long buried transmission line cable. The 230 kilovolt (kV) transmission line cable will be placed within an existing right-of-way that is 66 feet wide on the western half of route and 100 feet wide on the eastern half. The solar farm, transmission line right-of-way, and substation (including access road) are collectively considered the Project, hereon, with the Project Area being the collective of their surface footprint. The Project Area is shown on Figure 1. The purpose of this Project is to generate solar energy, provide public education on the benefits of solar energy, encourage future renewable-energy interest and investments, and reduce greenhouse gas (GHG) emissions across the Reservation.

1.2 AGENCY COORDINATION

Western Area Power Administration (WAPA) is the lead agency directing the development of a supplemental Environmental Assessment (EA) to meet National Environmental Protection Act (NEPA) requirements. Previously, the Bureau of Indian Affairs was the lead agency for the development of an EA that was finalized in 2017 and analyzed impacts exclusively associated with the solar farm located within the Pine Ridge Indian Reservation. No on-site biological resource surveys were required to complete the 2017 EA. With the Project scope and area increased to include the transmission line right-of-way and substation, WAPA has requested surveys to facilitate their environmental review per the Department of Energy (DOE) NEPA Implementing Procedures (10CFR 1021). The biological resource surveys scope of work and protocols were developed based on WAPA's NEPA requirements and informal consultation with the U.S. Fish and Wildlife Service regarding potential Endangered Species Act (ESA) listed species occurrence. In addition, South Dakota Game and Fish Department was consulted for state-listed Threatened or Endangered (T&E) species occurrences in the area.

1.3 REGULATORY CONTEXT

Special status species are those species for which state of federal agencies afford an additional level of protection by law, regulation, or policy. Included in this category are federally listed species that are protected under the ESA, the Migratory Bird Treaty Act (MBTA), the Bald and Golden Eagle Protection Act (BGEPA), and South Dakota State Endangered Species Law.

1.3.1 FEDERAL ENDANGERED SPECIES ACT

The ESA of 1973 protects plants and wildlife that are listed as endangered or threatened by the USFWS and the National Oceanic and Atmospheric Administration National Marine Fisheries Service (NOAA Fisheries). Section 9 of the ESA prohibits the "take" of endangered wildlife, which is defined as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in such conduct" (50 CFR 17.3). For plants, this statute governs removing, possessing, maliciously damaging, or destroying any listed plant on federal land and removing, cutting, digging-up, damaging, or destroying any listed plant on non-federal land in knowing violation of state law (16 USC 1538). Under Section 7 of the ESA, federal agencies are required to consult with the USFWS if their actions, including permit approvals or funding, could adversely affect a listed species (including plants) or its critical habitat. Federally listed species potentially affected by the Project are listed in Section 3.0 of this report.

1.3.2 MIGRATORY BIRD TREATY ACT AND BALD AND GOLDEN EAGLE PROTECTION ACT

The MBTA of 1918, offers protection to over 1,000 species of migratory birds including a variety of passerines and raptor species as a result of four bilateral treaties, or conventions, signed between the U.S. and Canada (1916), Mexico (1936, amended 1972 and 1999), Japan (1972), and Russia (1976). Under the MBTA, it is unlawful to pursue, hunt, take, capture, kill, possess, sell, purchase, barter, import, export, or transport any migratory bird, or any part, nest, or egg or any such bird, unless authorized under a permit issued by the Secretary of the Interior. Take is defined in regulations as: "pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect." If a nest is protected by the MBTA only and it is unoccupied (no eggs or nestlings), the nest is not protected from destruction or removal. The MBTA protects species using a nest, not the nest itself. A violation of the MBTA occurs when there is a "take" of a bird (egg, nestling, juvenile, or adult). For example, the destruction of an unoccupied migratory bird nest is not a violation of the MBTA. If a person destroys a migratory bird nest containing eggs, the violation of the MBTA is the take of the bird (egg), not the nest. Nests of certain exotic bird species are not protected by federal law. In South Dakota, those species include the Rock Pigeon (*Columba livia)*, House Sparrow (*Passer domesticus*), Eurasian Collared-Dove (*Streptopelia decaocto*), and European Starling (*Sturnus vulgaris*).

In addition to the MBTA, bald and golden eagles are protected under the BGEPA. This statute prohibits anyone without a permit from committing "take" of bald and golden eagles, including their parts, nests, and eggs. "Take" is defined as the actions to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest and disturb. Any eagle nest is protected, including the tree or nest substrate and surrounding area (if disturbance of the surrounding area makes the nest tree unsuitable), whether the nest is occupied or unoccupied.

1.3.3 SOUTH DAKOTA ENDANGERED SPECIES ACT

The State of South Dakota maintains a list of T&E species (SDGFP 2016) that are protected under state statute 34A-8, which states that no person may take, possess, transport, import, export, process, sell, or offer for sale, buy or offer to buy any species of wildlife or plants listed as threatened or endangered pursuant to §§ 34A-8-3 and 34A-8-4. Violations are considered a Class 2 misdemeanor. State T&E species potentially affected by the Project are listed in Section 3.0 of this report.

1.4 SURVEY AREA DESCRIPTION

Survey areas varied depending on the specific biological resource. A summary of resource specific survey areas is provided below:

- Plant Species Survey Area: Survey conducted within the proposed Project footprint
- Habitat Assessment Area: Habitat assessment was conducted within 0.5 miles of the proposed Project footprint
- Raptor Nest Survey Area: A raptor nest survey was conducted within 0.5 miles of the proposed Project footprint
- Northern long-eared bat Habitat Assessment Area: Habitat was assessed within 0.5 miles of the proposed Project footprint
- Wildlife Survey Area (migratory birds, bats, swift fox, other wildlife): Surveys were conducted within the proposed Project footprint including scanning of adjacent areas with optics

2.0 DESKTOP ASSESSMENT

Prior to field surveys, a desktop assessment was completed to identify potential wildlife, plants, and habitats present in the Survey Area. This assessment included the following:

- Query of the USFWS Information, Planning, and Conservation (IPaC) system database and request of an official USFWS species list for the Project to identify potential ESA-listed endangered, threatened, candidate, or proposed species that may be affected by the Project
- Special status species information request from the South Dakota Game, Fish, and Parks (SDGFP)
- Review of the SDGFP State Wildlife Action Plan (SDGFP 2014) and Data Explorer
- Review of National Wetland Inventory (NWI) data to identify important wetland and riparian habitats
- Review of U.S. Geological Survey (USGS) Regional Gap Analysis Program (GAP) ecological community data
- Review of 2018 Range-Wide Indian Bat Survey Guidelines (USFWS 2018)
- Review of soils and Ecological Site Assessment data from the NRCS Web Soil Survey (NRCS 2018)
- Review of Google Earth aerial imagery of the Survey Area

The above sources were used to identify potential habitats for nesting raptors, western prairie fringed orchid (*Platanthera praeclara*), whooping crane (*Grus americana*), black-footed ferret (*Mustela nigripes*), northern long-eared bat (*Myotis septentrionalis*) (NLEB), and other species of interest. Potentially suitable habitats were identified on field maps and used to develop field survey areas and protocols.

Below is a summary of wildlife and plant species that are contained within the IPaC report and/or SDGFP T&E species list for Custer and Oglala Lakota Counties. These species have either been documented in the County (for State T&E species) or have potential to occur and/or be impacted by the proposed Project. Table 1 also indicates the relative potential for occurrence in the Project Area (None, Very Low, Low, Moderate, and High), which is based on an assessment of potential habitat and occurrence data for the Survey Area. The USFWS official species list is included in Appendix A. A list of state listed T&E species that have been documented in South Dakota, by County, is included in Appendix B.

The results of a South Dakota Natural Heritage Database search indicated that two rare species, the spiny softshell turtle (*Apalone spinefera*) and plains topminnow (*Fundulus sciadicus*) have been documented in the Cheyenne River

near the transmission line crossing. In addition, burrowing owls (*Athene cunicularia*) have been documented in the area. These species are considered rare, but not are not designated as threatened or endangered by SDGFP.

TABLE 1. SPECIAL STATUS SPECIES ASSESSED FOR THE PROJECT

Species	Status[1]	Potential Occurrence in Project Area[2]	Habitat in Project Area	Surveys	Documented During Survey?
ESA-Listed T&E Species					
Whooping crane *Grus Americana*	FT, SE	Very Low	May occur during migration, but highly unlikely. May use wetlands and croplands near the Project Area.	Habitat Assessment	No
Red knot *Calidris canutus*	FT	None	None.	None	No
Northern long-eared bat *Myotis septontrionalis*	FT	Low	Potential roost trees adjacent to Project Area, primarily along Cheyenne River and Cottonwood Creek.	Habitat assessment. No adverse effects = no USFWS protocol surveys needed	No
Western prairie fringed orchid *Platanthera praeclara*	FT	None	No suitable habitat in the Project Area. Very rare in SD. Typically associated with unplowed mesic to wet tallgrass prairie but has been found in old fields and roadside ditches.	Habitat Assessment	No
Black-footed ferret[3] *Mustela nigripes*	FE, SE	None	Unlikely to occur in Project Area. Uses prairie dog colonies.	Habitat Assessment.	No
State-Listed T&E Species					
Swift Fox *Vulpes velox*	ST	Moderate	May occur in grasslands throughout the Project Area.	Habitat Assessment, visual surveys and camera traps	No
Osprey *Pandion haliaetus*	ST	Low	May occur along Cheyenne River. Potential nest sites, but nesting unlikely due to rarity of bird in this area.	Nest survey within 0.5-mile Project Area	No

Species	Status[1]	Potential Occurrence in Project Area[2]	Habitat in Project Area	Surveys	Documented During Survey?
American dipper *Cinclus mexicanus*	ST	Low	Fast-moving, clear, unpolluted streams with cascades, riffles, and waterfalls.	None. No impacts to dipper habitats.	No
Northern river otter *Lontra canadensis*	ST	Low	Rivers and beaver ponds.	None. No impacts to riverine habitats.	No
Blacknose shiner *Notropis heterolepis* **Longnose sturgeon** *Catostomus catostomus* **Sturgeon chub** *Mcarhybopsis gelida*	SE ST ST	None	Cheyenne River. River will be crossed with horizontal directional drill (HDD)	None. No impact to fish bearing streams or waters.	No
Other Protected Wildlife					
Raptors	MBTA, BGEPA	High	Potential nesting habitat for Swainson's hawk, red-tailed hawk, ferruginous hawk, and great-horned owl	Nest survey within 0.5-mile buffer surrounding Project Area	Yes. See Section 3.4.

[1]Status:
- FE (Federally Endangered)
- FT (Federally Threatened)
- SE (State Endangered)
- ST (State Threatened)
- MBTA (Migratory Bird Treaty Act)
- BGEPA (Bald and Golden Eagle Protection Act

[2] Potential Occurrence in the Project Area:
- Very Low = extremely rare but may occur during migration
- Low = within the known range of the species, species uncommon in area, habitat is marginal or very limited
- Moderate = within the known range of the species, limited amount of suitable habitat present
- High = within the known range of the species, suitable habitat abundant in area, species documented in area

[3] Black-footed ferret is on the Oglala Lakota County list (2016); but is not included on the USFWS official species list for the Project Area.

3.0 FIELD-BASED ASSESSMENT

Field surveys were completed between June 11, 2018 and June 16, 2018. Surveys included an aquatic resources inventory (reported separately), a plant species survey for affected species in the Project Area, a habitat assessment, a raptor nest survey, swift fox (*Vulpes velox*) surveys, NLEB habitat assessment, bat acoustic surveys, and a pedestrian survey to identify migratory bird use and other wildlife species in the area.

3.1 PLANT SPECIES SURVEY

All plant species observed in the Plant Species Survey Area were recorded in a field note book and are listed in Table 2. Surveys for plant species were limited to areas within the solar farm, substation and access road, and within the transmission line right-of-way so as to include any plant species potentially affected by the Project, including species being removed, trimmed, or relocated.

In total, 74 plant species were recorded within the Survey Area including 30 grass or grass-like plants, 11 woody plants including trees and shrubs, and 33 forbs. Western prairie fringed orchid is included on the USFWS official species list for the Project Area and is listed as threatened in Oglala Lakota County by SDGFP. The western prairie fringed orchid is a perennial orchid that inhabits tallgrass prairie and is found most often on unplowed, calcareous prairies and sedge meadows (USFWS 1996). Desktop review and an onsite habitat assessment indicated that suitable habitat for the species is not present. SDGFP notes that the counties indicated for western prairie fringed orchid are counties with potential habitat; however, currently there are no known populations of the species in South Dakota (SDGFP 2016).

TABLE 2. PLANT SPECIES FOUND WITHIN THE PROJECT AREA

Common Name	Scientific Name	Common Name	Scientific Name
Grasses and Grass-like Plants		**Forbs**	
Crested wheatgrass	*Agropyron cristatum*	Northern water plantain	*Alisma triviale*
Short-awn foxtail	*Alopecurus aequalis*	Prickly poppy	*Argemone polyanthemos*
Meadow foxtail	*Alopecurus pratensis*	White sagebrush	*Artemesia ludoviciana*
Purple three-awn	*Aristida purpurea*	Showy milkweed	*Asclepias speciosa*
Buffalo grass	*Bouteloua dactyloides*	Cream milkvetch	*Astragalus racemosus*
Smooth brome	*Bromus inermis*	Lambsquarters	*Chenopodium album*
Field brome	*Bromus arvensis*	Canada thistle	*Cirsium arvense*
Cheatgrass	*Bromus tectorum*	Wavy leaf thistle	*Cirsium undulatum*
Shortbeak sedge	*Carex brevoria*	Field bindweed	*Convolvulus arvensis*
Panic grass	*Dichanthelium sp.*	Western wallflower	*Erysimum asperum*
Needle spikerush	*Eleocharis acicularis*	American licorice	*Glycyrrhiza lepidota*
Common spikerush	*Eleocharis palustris*	Curly cup gumweed	*Grindelia squarrosa*
Streambank wheatgrass	*Elymus trachycaulus*	Prairie sunflower	*Helianthus petiolaris*
Horsetail	*Equisetum sp*	Prickly lettuce	*Lactuca serriola*
Stinkgrass	*Eragrostis cilianensis*	Common pepperweed	*Lepidium densiflorum*
Needle and thread	*Hesperostipa comata*	Alfalfa	*Medicago sativa*

Common Name	Scientific Name	Common Name	Scientific Name
Fescue	*Festuca spp.*	Yellow sweet clover	*Melilotus officinalis*
Inland rush	*Juncus interior*	Wild mint	*Mentha arvensis*
Prairie junegrass	*Koeleria macrantha*	Scarlet beeblossom	*Oenothera suffretescens*
Green needlegrass	*Nassella viridula*	Little pricklypear	*Opuntia fragilis*
Western wheatgrass	*Pascopyrum smithii*	Plains pricklypear	*Opuntia polycantha*
Kentucky bluegrass	*Poa pratensis*	Lilac penstemon	*Penstemon gracilis*
Sandberg bluegrass	*Poa secunda*	Wooly plaintain	*Plantago patagonica*
Tall fescue	*Schedonorus arundinaceus*	Prairie rose	*Rosa arkansana*
Little bluestem	*Schizachyrium scoparium*	Curly dock	*Rumex crispus*
Bulrush	*Schoenoplectus spp.*	Tall tumblemustard	*Sisybrium altissimum*
Pale bulrush	*Scirpus pallidus*	Scarlet globemallow	*Sphaeralcea coccinea*
Prairie cordgrass	*Spartina pectinata*	Common dandelion	*Taraxacum officinale*
Narrowleaf cattail	*Typha angustifolia*	Spiderwort	*Tradescantia sp.*
Soapweed yucca	*Yucca glauca*	Western salsify	*Tragopogon dubius*
		Common mullein	*Verbascum thapsus*
		Hoary vervain	*Verbena stricta*
		Hookedspur violet	*Viola andunca*
Woody Plants		**Woody Plants**	
Box elder	*Acer negundo*	American plum	*Prunus americana*
False indigo bush	*Amorpha fruticosa*	Narrowleaf willow	*Salix exigua*
Spreading dogbane	*Apocynum androsaemifolium*	Crack willow	*Salix fragilis*
Sand sagebrush	*Artemesia filifolia*	Western snowberry	*Symphoricarpos albus*
Russian olive	*Elaeagnus angustifolia*	Siberian Elm	*Ulmus pumila*
Plains cottonwood	*Populus deltoides*		

3.2 HABITAT ASSESSMENT

GAP data were used to identify ecological communities in the Habitat Assessment Area. However, these data are based on aerial imagery obtained from remote-sensing, intended for use in characterization landscapes, and therefore do not always correlate with ecological communities observed on-the-ground. GAP ecological communities were used as a guide in identifying potential habitats present in the Habitat Assessment Area; however, these ecological communities were regrouped into four general habitat types observed in the field for the purpose of this report. Habitat descriptions include dominant plant species and wildlife species observed during the field habitat assessment. Information derived from the habitat assessment were also used in assessing potential habitats for T&E species including western prairie fringed orchid, whooping crane, northern long-eared bat, swift fox, and black-footed ferret, which are described later in the report.

The Project is located with the Northwestern Great Plains Level III Ecoregion, which includes most of western South Dakota with the exception of the Black Hills. A total of 17 ecological systems have been mapped within the Habitat Assessment Area using Gap Analysis Project (GAP) National Terrestrial Ecosystem data (USGS 2011). These ecological systems and their acreages within 0.5 miles of the Project Area, are presented in Table 3. The greatest

acreage consists of grassland systems including Northwestern Great Plains Mixedgrass Prairie and Western Great Plains Shortgrass Prairie, which together account for approximately 80 percent of the Project Area. As is shown in Table 3, these ecological systems have been grouped into four primary habitat types in the Habitat Assessment Area, including grassland, riparian and wetland, cropland, and developed or disturbed. Some ecological systems indicated by GAP data, such as the Black Hills Ponderosa Pine Woodland and Savanna, were not observed in the Habitat Assessment Area and are incorrectly reported. Other systems, such as Western Great Plains Wooded Draw and Ravine were limited to only a few small patches within the Habitat Assessment Area.

TABLE 3. HABITAT TYPES IN THE ASSESSMENT AREA

GAP ECOLOGICAL SYSTEM	TOTAL ACRES	HABITAT TYPE	PERCENTAGE (%) OF ASSESSMENT AREA
Northwestern Great Plains Mixedgrass Prairie	4,494	Grassland	45.8%
Western Great Plains Shortgrass Prairie	3,333	Grassland	34.0%
Cultivated Cropland	842	Cropland	8.6%
Northwestern Great Plains - Black Hills Ponderosa Pine Woodland and Savanna	246	Other	2.5%
Pasture/Hay	221	Cropland	2.3%
Introduced Upland Vegetation-Perennial Grassland/ Forbland	180	Grassland	1.8%
Developed, High Intensity	128	Developed or Disturbed	1.3%
Western Great Plains Floodplain Systems	126	Wetland	1.3%
Open Water (Fresh)	65	Wetland	0.7%
Developed, Open Space	60	Developed or Disturbed	0.6%
Western Great Plains Depressional Wetland Systems	42	Wetland	0.4%
Western Great Plains Sand Prairie	30	Grassland	0.3%
Western Great Plains Sandhill Steppe	23	Grassland	0.2%
Developed, Low Intensity	6	Developed or Disturbed	0.1%
Western Great Plains Wooded Draw and Ravine	2	other	0.0%
Rocky Mountain Foothill Limber Pine-Juniper Woodland	2	other	0.0%
Western Great Plains Badland	1	other	0.0%
Grand Total	9,803		

Habitat Type Totals	Total Acres	Percentage (%) of Assessment Area
Grassland	8,060	82.2%
Cropland	1,063	10.8%
Wetland and Riparian	234	2.4%
Developed or Disturbed	195	2.0%
Other	251	2.6%

Grassland

Grassland habitats comprise approximately 82 percent of the Habitat Assessment Area and consist of a mosaic of various short- and mixed- grass prairie types. Sand sagebrush (*Artemesia filifolia*) stands are present within a few grassland areas, including much of the solar farm. With the exception of these stands of sand sagebrush, grassland habitats are dominated by graminoids associated with mixed grass prairie, including western wheatgrass (*Pascopyrum smithii*), green needlegrass (*Nassella viridula*), purple three-awn (*Aristida purpurea*), and prairie junegrass (*Koeleria macrantha*). Graminoids more closely associated with the shortgrass prairie system include buffalo grass (*Bouteloua dactyloides*) and Sandberg bluegrass (*Poa secunda*). A number of invasive grasses including cheatgrass (*Bromus tectorum*) and field brome (*Bromus arvensis*) are common in grassland habitat, with smooth brome (*Bromus inermis*) present primarily adjacent to disturbed areas and along roads. In some grassland habitats, primarily on the eastern extent of the Habitat Assessment Area, and in the proposed solar farm, stands of sand sagebrush are present with a lesser component of fringed sage (*Artemesia frigida*), soapweed yucca (*Yucca glauca*), and various forb species. Most of the grassland habitats are grazed by cattle. Wildlife species observed using grassland habitats are presented in Section 3.8 and include grassland specialists such as upland sandpiper (*Bartramia longicauda*), lark bunting (*Calamospiza melanocorys*), dickcissel (*Spiza Americana*), and sharp-tailed grouse (*Tympanuchus phasianellus*). One black-tailed prairie dog (*Cynomys ludovicianus*) colony was identified within 0.5 miles of the proposed transmission line and both burrowing owls and long-billed curlew (*Numenius americanus*) were observed using this patch of shortgrass prairie.

Riparian and Wetland

Riparian and wetlands habitats comprise approximately 2 percent of the Habitat Assessment Area; however, they provide essential habitat to a large number of species. There are two riparian areas within the Habitat Assessment Area; one along the Cheyenne River and another along Cottonwood Creek, an intermittent tributary to the Cheyenne. Riparian areas are dominated by woody vegetation including eastern cottonwood (*Populus deltoides*), box elder (*Acer negundo*), and Russian olive (*Elaeagnus angustifolia*). Understory species in riparian systems vary considerably, but include western snowberry (*Symphoricarpos occidentalis*) and various grasses, typically dominated by smooth brome. A number of wetlands occur in the Habitat Assessment Area including emergent wetlands and scrub-shrub wetlands. Emergent wetlands are dominated by narrowleaf cattail (*Typha angustifolia*), bulrushes (*Schoenoplectus* spp.), spike rushes (*Eleocharis* spp.), prairie cordgrass (*Spartina pectinata*), and other hydrophytic species. Emergent wetlands adjacent to the two riparian areas described above, are dominated by cattails and bulrush whereas spikerush dominates closed depressional wetlands found in a few areas in the Solar Farm. Scrub-shrub wetlands are dominated by narrowleaf willow (*Salix exigua*). Open water habitats are also present and include small ponds and riverine systems including the Cheyenne River. Wildlife species observed using riparian and wetland habitats are presented in Sections 3.8 and 3.9, and include a variety of waterfowl, snapping turtle (*Chelydra serpentina*), and songbirds birds such as

red-winged blackbirds (*Agelaius phoeniceus*) and yellow-billed cuckoo (*Coccyzus americanus*). Great horned owls (*Bubo virginanus*) and hawks (*Buteo* spp.) were also observed nesting in riparian habitat along the Cheyenne River.

Cropland

Croplands comprise approximately 10 percent of the Habitat Assessment Area and include cultivated crop fields and hay pastures. The primary agricultural crop in the Habitat Assessment Area is hay in the form of smooth brome, alfalfa (*Medicago sativa*), yellow sweet clover (*Melilotus officianalis*), and other herbaceous plants that are regularly harvested during the growing season. In addition, a small acreage of corn (*Zea mays*) is grown in irrigated fields adjacent to the Cheyenne River. A series of ditches provides water to irrigated cropland immediately west of the Cheyenne River. Croplands provide habitat to many wildlife species including deer, small mammals, and many avian species.

Developed or Disturbed

As can be seen on Figure 2, developed or disturbed areas are typically associated with roads and other human disturbance such as residential and agricultural buildings. These habitat types comprise approximately 2 percent of the Habitat Assessment Area. Vegetation in and adjacent to developed and disturbed areas is dominated by introduced and invader species. These species can be primarily seen along roadways (including the area adjacent to and directly below the Cheyenne River bridge) and include smooth brome, yellow sweet clover, cheat grass, field brome, curly dock (*Rumex crispus*), Canada thistle (*Cirsium arvense*), field bindweed (*Convolvulus arvensis*), pepperweed (*Lepidium latifolium*), common mullein (*Verbascum thapsus*), and a small proportion of native species described above for grassland and riparian and wetland habitats. Although developed and disturbed areas typically do not support a diverse array of native wildlife species, they do provide value to some wildlife species including those habituated to human presence including European starlings (*Sturnus vulgaris*) and Eurasian collard doves (*Streptopelia decaocto*). Examples of wildlife observed using developed and disturbed areas also include cliff swallows (*Petrochelidon pyrrhonota*) and raccoon (*Procyon lotor*) which were observed using habitat under and adjacent to the Cheyenne River bridge. Above ground utility lines in the area provide excellent perches for a variety of birds and raptor species.

3.3 RAPTOR NEST SURVEY

A survey was completed to identify raptor nests within 0.5 miles of the Project Area. Binoculars and a spotting scope were used to scan potential habitats for nests or potential raptor breeding activity. A vehicle was used to access areas with good vantage points where potential nesting habitat could be best observed. Identified nests were observed and classified as either active or inactive. Active nests were nests in which two adults and/or young were observed at the nest during the survey. Inactive nests were nests in which no raptor activity was observed. In addition to

characterizing nests as active or inactive, the nest type, nest substrate, nest height, nest species, and other observations were recorded.

A total of five raptor nests were documented in the Raptor Survey Area, including an active burrowing owl (BUOW) nest/territory, an active Swainson's hawk (*Buteo swainsoni*) (SWHA) nest, an active great-horned owl (GRHO) nest, and two inactive *Buteo* spp. nests (red-tailed hawk *[Buteo jamaicensis*] or Swainson's hawk). Nest locations are shown on Figure 3. In addition, American kestrels (*Falco sparverius*) were observed in a few locations throughout the Raptor Survey Area, with multiple sightings south of the substation. It is likely that kestrels are nesting in the Raptor Nest Survey Area; however, these nests are often inconspicuous. A golden eagle (*Aquila chrysaetos*) and a northern harrier (*Circus cyaneus*) were observed flying over the Raptor Survey Area; however, there was no indication of breeding by either species. Table 4 presents a description of each documented raptor nest in the Raptor Survey Area. Nest photos are presented in Appendix C. Note that the exact location of the great-horned owl nest was not observed and the nest was not photographed due to presence of young in the area. So as to not disturb the active nest site, biologists maintained a distance from the perceived location of the nest.

TABLE 4. RAPTOR NESTS IN THE SURVEY AREA

Species	Status	Nest Material / Condition	Nest Substrate/Height (feet)	Distance from Project Area (miles)	Notes	Latitude and Longitude
Burrowing owl	Active	Prairie dog burrow / Excellent	Ground / 0	0.10	2 adults, 3 fledglings. Active prairie dog colony	43.504219, -103.035649
Great-horned owl	Active	Stick nest/cavity / unknown	Cottonwood/10-20	0.19	2 adults, at least one fledgling	43.504334, -103.072350
Swainson's hawk	Active	Stick nest / Good	Cottonwood/30	0.08	2 adults, no young or incubation observed	43.507179, -103.090372
Buteo spp.	Inactive	Stick nest / Good	Cottonwood/40	0.25	No raptor activity	43.505168, -103.068513
Buteo spp.	Inactive	Stick nest / Good	Cottonwood/35	0.25	No raptor activity	43.527118, -103.145892

3.4 SWIFT FOX SURVEY

The Project is within the known range for swift fox and comprises potentially suitable short-grass prairie habitat for the species. A combination of pedestrian and vehicular-based surveys were used to search for swift foxes and their sign, which includes tracks, scat, or den sites. Binoculars and a spotting scope were also used to scan the area from good vantage points, such as hill tops. In addition to visual encounter surveys, two camera traps were set; one in the solar farm and the other at the substation. A fox scent lure combined with skunk essence was placed on a wood stake approximately 10 feet from each camera, and the camera was set to take photos whenever triggered by movement throughout the day and night. Each camera was deployed for 5 days and 4 nights. Photos were later reviewed to identify any footage of swift foxes.

Potential grassland habitat is present across much of the Widlife Survey Area including the solar farm and substation. According to the SDGFP 2018 status reviews, swift foxes have been documented in both Custer County (prior to 2000) and Oglala Lakota County (after 2000). In 2009 and 2010, the Oglala Sioux Parks and Recreation Authority released 79 wild-caught swift fox onto the Pine Ridge Reservation in Oglala Lakota County. Four dens and six individuals were documented via camera and live trapping efforts in 2013 and 2014. However, the Swift Fox Survey Area is not within the mapped range of the species according to the South Dakota Wildlife Action Plan Explorer Tool (SDGFP 2014).

Neither swift foxes nor their sign were observed during the visual surveys or at either camera trap station. Much of the solar farm location consists of stands of sand sagebrush, which are not typically suitable habitat for swift fox. Elsewhere in the Wildlife Survey Area, farming and ranching practices have altered the landscape. Prey species including lagomorphs and prairie dogs were observed to be in relatively low abundance throughout the Wildlife Survey Area. In South Dakota, black-tailed prairie dogs comprise much of the swift fox's diet (Uresk and Sharps 1986), and prairie dog colonies provide high quality habitat for swift fox due to an abundance of pretty and potential den sites. Both rodent control and competition from other canids (i.e. coyote) have been cited as primary causes in the species' decline (Smiley and Keinath 2003). In particular, the elimination of prairie dog colonies has been implicated in reducing the quality of swift fox habitat across the species' range (Beauvais 2000). Prairie dog eradication in the Wildlife Survey Area is evident based on conversations with landowners in the area and from ground disturbance visible on aerial imagery in historic prairie dog colonies. In its current state, the Wildlife Survey Area appears to provide limited prey for swift fox.

3.5 NORTHERN LONG-EARED BAT HABITAT ASSESSMENT

The USFWS indicates that the Project Area is within the "Area of Influence" of the northern long-eared bat (NLEB). According to USFWS Summer Survey Guidance (USFWS 2018), suitable summer habitat for the NLEB consists primarily of forests and woodlands, including riparian areas. However suitable habitats may also include nearby

emergent wetlands and edge habitats such as fields and pastures adjacent to woodlands. Potential roost trees include live trees and/or snags ≥3 inches diameter breast height with loose bark, crevices, or cavities. Tree density and canopy cover within suitable habitats varies considerably. Isolated trees or clusters that have roost tree characteristics described above that are within 1,000 feet of other forested/wooded areas may be considered suitable habitat. NLEBs have also been observed roosting in buildings, barns, bridges, and bat houses; therefore, some human-made structures should also be considered potential summer habitat. Summer habitats are typically used from mid-May through mid-August.

Because the Project is not anticipated to result in adverse effects to NLEBs, surveys are not required by the USFWS as described in the 2018 Summer Survey Guidance (USFWS 2018). However, NLEB, along with a number of other bat species of concern, may forage over the Project Area and potentially roost in adjacent areas. Therefore, two acoustic bat recorders were placed in the Project Area to assess species presence and composition; one along the Cheyenne River and another along Cottonwood Creek (Tributary to the Cheyenne River) where the transmission line crosses. Methods followed those described in the USFWS Indiana Bat 2018 Summer Survey Guidance (USFWS 2018). Both bat detectors used were Wildlife Acoustics SM4Bat detectors combined with SMM_U2 ultrasonic microphones. Microphones were placed at the edge of potential bat flyways and elevated approximately 12-15 feet above the ground. Gain was set to 0 dB, the maximum recording length of each file was set to 5 seconds, and the detectors were set to record 30 minutes prior to sunset and 30 minutes after sunrise. Each detector was deployed for 4 nights for a total of 8 detector nights. Bat recordings were then analyzed using Kaleidoscope Pro Version 4.54 and auto-classified with a 0 balanced setting. Recordings were then hand-vetted to identify diagnostic call-sequences based on high-quality sequence recordings, with attention to primarily search-phase calls.

The Project Area is within the USFWS "Area of Influence" for NLEB, however, the known distribution of NLEBs is approximately 15 miles from the Project Area, in the Black Hills and approximately 40 miles to the east in Badlands National Park (SDGFP 2014). No suitable habitat was identified at either the solar farm site or the substation where permanent above ground structures will be placed. These parcels consist of grasslands with no trees or rock outcrops/caves that could provide hibernacula. As described above, there is potential NLEB habitat along the Cheyenne River and Cottonwood Creek. These two areas are shown on Figure 3 as bat detector locations. No potential roost trees were identified within the Project Area, including the transmission line right-of-way where clearing will occur. Large trees, primarily eastern cottonwood, are present along the two riparian areas described above. Some large snags with loose bark and crevices were observed. These may provide potential summer roost sites for NLEBs as well as a number of other tree roosting bat species. Although potential habitat for the NLEB is present along riparian areas adjacent to the transmission line route, no adverse impacts are expected due to the lack of potential roost trees in the

Project Area where construction will occur. Any potential presence of NLEB would be limited to individuals foraging over the Project Area and potentially roosting in wooded riparian areas adjacent to the transmission line corridor.

3.6 BAT ACOUSTIC SURVEY

A total of eleven bat species were auto-classified by Kaleidoscope Pro from 6,414 bat recordings over 8 detector nights. However, three of these species could not be verified as present based on a lack of diagnostic call characteristics during hand-vetting and/or a low number of calls with a high p-value equating to low confidence in the auto classifier. The results of the acoustic bat surveys are presented in Table 5.

Bat species verified as present include Townsend's big-eared bat (*Corynorhinus townsendii*), big brown bat (*Eptesicus fuscus)*, silver-haired bat (*Lasionycteris noctivagans*), western small-footed myotis (*Myotis ciliolabrum*), little brown bat (*Myotis lucifigus*), fringed myotis (*Myotis thysanodes*), and long-legged myotis (*myotis volans*). Fringed myotis, silver-haired bat, and Townsend's big-eared bat are each classified as a Species of Greatest Conservation Need by SDGFP (SDGFP 2014). At both detector sites, little brown bat and western small-footed myotis comprised the majority of recordings. Although a low number of Townsend's big-eared bat and fringed myotis calls were recorded, these recordings contained diagnostic features that are typically not confused with other bat species in the region. A total of 92 eastern red bat recordings were auto-classified by Kaleidoscope Pro; however, most of the calls contained call sequences that were suggestive of little brown bat. No diagnostic eastern red bat call sequences were identified during hand-vetting. A small number of call sequences were auto-classified as western long-eared myotis (*Myotis evotis*, 3 auto-IDs) and northern long-eared bat (*Myotis septentrionalis*, 10 auto-IDs). However, these species cannot be verified as present based on a combination of a lack of diagnostic call sequences, and a low number of recordings and subsequently high p-value (p=1). Figure 4 displays the overall species composition for each bat species at each detector site. Only bat species verified as present via hand-vetting are displayed.

TABLE 5. ACOUSTIC BAT SURVEY RESULTS

	Cheyenne River						Cottonwood Creek (Tributary)						Both	Confirmed Present via Hand-Vetting
Species[1]	11-Jun	12-Jun	13-Jun	14-Jun	TOTAL	P-Value	11-Jun	12-Jun	13-Jun	14-Jun	TOTAL	P-Value	TOTAL	
CORTOW[2]	0	1	0	0	1	1	0	0	0	0	0	1	1	Yes
EPTFUS	57	24	128	196	405	0	7	2	5	8	22	0.14	427	Yes
LASCIN	41	110	337	108	596	0	14	9	170	8	201	0	797	Yes
LASNOC	21	8	99	51	179	0	3	1	28	2	34	0.92	213	Yes
MYOCIL	1230	351	48	237	1866	0	138	72	27	100	337	0	2203	Yes
MYOLUC	260	580	564	736	2140	0	37	35	63	168	303	0	2443	Yes
MYOTHY[2]	1	1	2	1	5	1	0	0	0	1	1	1	6	Yes
MYOVOL	48	13	20	41	122	0	8	4	37	48	97	0	219	Yes
LASBOR[3]	8	0	44	11	63	0.69	5	4	13	7	29	0	92	No
MYOEVO	0	1	0	2	3	1	0	0	0	0	0	1	3	No
MYOSEP	0	0	3	3	6	1	0	0	4	0	4	1	10	No
Total Bats	1666	1089	1245	1386	5386	-	212	127	347	342	1028	-	6414	-
NO ID	732	651	815	856	3054	-	93	70	138	163	464	-	3518	-
NOISE	42	69	423	434	968	-	233	92	124	89	538	-	1506	-

[1] CORTOW: Townsend's big-eared bat, EPTFUS: big brown bat, LASCIN: hoary bat, LASNOC: silver-haired bat, MYOCIL: western small-footed myotis, MYOLUC: little brown bat, MYOTHY: fringed myotis, MYOVOL: long-legged myotis, LASBOR: eastern red bat, MYOEVO: long-eared myotis, MYOSEP: northern long-eared bat (NLEB).
[2] Although only a few recordings of CORTOW and MYOTHY were auto-classified, these recordings contained diagnostic characteristics of the species indicating presence.
[3] Although a large number of calls were auto-classified as LASBOR, no diagnostic sequences were recorded. Hand-vetting indicated most LASBOR classifications were likely MYOLUC based on downward trending tails characteristic of Myotis species only.

3.7 MIGRATORY BIRD SURVEY

Surveys for migratory birds were completed using a combination of vehicular surveys (driving along the road and stopping at regular intervals to scan the surrounding area for wildlife) and pedestrian-based surveys in inaccessible areas or areas of high potential habitat (i.e. wetlands, riparian areas, prairie dog colonies). Bird nests, notes on habitat use, and relative abundance were documented in field notes. A list of migratory bird species, including relative abundance and other observations, is presented in Section 3.8 of this report.

A total of 43 bird species were documented in the Wildlife Survey Area including songbirds, waterfowl, raptors, upland game birds, and shorebirds. These species, along with their estimated abundance and nesting habitat in the Wildlife Survey Area, are presented in Table 6. Of these 43 species, 10 were documented as nesting in the Project Area including burrowing owl, upland sandpiper, Canada goose (*Branta Canadensis*), mallard (*Anas platyrhynchos*), Swainson's hawk, killdeer (*Charadrius vociferous*), cliff swallow, American robin (*Turdus migratrius*), and mourning dove (*Zenaida macroura*). However, it is likely that other species are nesting as well. Table 6 includes observational notes for most species including some information on species likely nesting in the Wildlife Survey Area based on field observations. Three sharp-tailed grouse hens were observed near a stock tank and planted tree rows in the middle of the solar farm. The location is displayed on Figure 3. Greater sage-grouse (*Centrocercus urophasianus*) distribution does not overlap the Survey Area (SDGFP 2014).

The whooping crane (*Grus Americana*) is a federally endangered species that was included on the USFWS official species list for the Project Area. Whooping Cranes in the Aransas-Wood Buffalo population migrate between the Aransas National Wildlife Refuge on the Gulf of Mexico and the Wood Buffalo National Park in northeastern Alberta and the southern Northwest Territories. The most recent population estimate for the population was 431 individuals. Whooping cranes may stopover nearly anywhere in South Dakota during their migration; however, the Missouri River corridor is preferred (SDGFP 2014). Although unlikely, whooping cranes may use riparian and wetland habitats along the Cheyenne River and may forage in adjacent crop fields in the Survey Area during spring or fall migration.

TABLE 6. AVIAN SPECIES DOCUMENTED IN THE WILDLIFE SURVEY AREA

Common Name	Scientific Name	Estimated Abundance[1]	Nesting Habitat in Survey Area	Notes
Red-winged blackbird	*Agelaius phoeniceus*	High	Wetland	Abundant
Grasshopper sparrow	*Ammodramus savannarum*	High	Grassland	Common
Green-winged teal	*Anas carolinensis*	Low	Wetland	Three birds on pond near substation
Mallard	*Anas platyrhynchos*	Moderate	Wetland	Common on ponds in area, nesting in pond south of substation
Golden eagle	*Aquila chrysaetos*	Low	Limited to tall trees in area	One bird soaring near substation site, no nesting cliffs
Burrowing owl	*Athene cunicularia*	Low	Grassland, BTPD colonies	Nesting south of road in prairie dog colony. Three fledglings
Upland sandpiper	*Bartramia longicauda*	High	Grassland	Common, nesting, eggs observed
Canada goose	*Branta canadensis*	Low	Wetland, riparian	Nesting along Cheyenne River
Great-horned owl	*Bubo virginanus*	Low	Riparian, trees	Nesting (fledgling stage) in riparian north of bridge
Red-tailed hawk	*Buteo jamaicensis*	Low	Riparian, trees	Possibly nesting along Cheyenne River within 1 mile of road. Unoccupied potential nest documented.
Swainson's hawk	*Buteo swainsoni*	Low	Riparian, trees	Nesting within 0.5 mile of road
Lark bunting	*Calamospiza melanocorys*	High	Grassland	Common in grassland habitat
Turkey vulture	*Cathartes aura*	Low	Unlikely but possible in *Buteo* nests or riparian	Soaring in area
Killdeer	*Charadrius vociferus*	High	Wetland	Common, nesting, young/eggs observed
Lark sparrow	*Chondestes grammacus*	Moderate	Grassland	
Common nighthawk	*Chordeiles minor*	Moderate	Variable - ground nester	Possibly more abundant, heard a few buzz calls
Northern harrier	*Circus cyaneus*	Low	Wetlands - ground nester	One bird foraging near substation
Yellow-billed cuckoo	*Coccyzus americanus*	Low	Riparian willows/cottonwoods	Two birds in Cheyenne River riparian area. Probably nesting
American kestrel	*Falco sparverius*	Moderate	Tree cavities	Likely nesting south of substation
Barn swallow	*Hirundo rustica*	High	Bridges, buildings	
Orchard oriole	*Icterus spurius*	Moderate	Riparian, trees	

Common Name	Scientific Name	Estimated Abundance[1]	Nesting Habitat in Survey Area	Notes
Red-headed woodpecker	*Melanerpes erythrocephalus*	Low	Riparian, trees (cavity nester)	One bird near river in dead tree. Likely nesting in tree cavity
Wild turkey	*Meleagris gallopavo*	Low	Riparian, grassland (on ground)	One tom near river
Brown-headed cowbird	*Molothrus ater*	High	Various, usually shrubs/trees	
Long-billed curlew	*Numenius americanus*	Low	Grassland	3 individuals near prairie dog colony
Blue grosbeak	*Passerina caerulea*	Low	Riparian, trees/shrubs	In Cheyenne River riparian area
Cliff swallow	*Petrochelidon pyrrhonota*	High	Bridges	Nesting at Cheyenne River bridge
Ring-necked pheasant	*Phasianus colchicus*	Low	Ground nest in dense vegetation	Probably more abundant, saw two individuals along road in tall vegetation
Black-billed magpie	*Pica hudsonia*	Low	Riparian, trees	
Common grackle	*Quiscalus quiscula*	Moderate	Riparian	
Black phoebe	*Sayornis nigricans*	High	Bridges, buildings	Common
Say's phoebe	*Sayornis saya*	Low	Bridges, buildings	
Eastern bluebird	*Sialia sialis*	Low	Tree cavities	
American goldfinch	*Spinus tristis*	Low	Trees/shrubs	
Dickcissel	*Spiza american*	Moderate	Grassland or sand sage areas	
Eurasian collard dove	*Streptopelia decaocto*	Low	Trees, buildings	
Western meadowlark	*Sturnella neglecta*	High	Grassland	Abundant
European starling	*Sturnus vulgaris*	Moderate	Riparian, trees (cavity nester)	
Brown thrasher	*Toxostoma rufum*	Low	Riparian, trees/shrubs	
American robin	*Turdus migratorius*	Moderate	Riparian, trees, buildings	Nesting observed along road in cottonwood tree
Sharp-tailed grouse	*Tympanuchus phasianellus*	Low	Grassland	3 hens at Lookout Solar Farm near tree rows
Western kingbird	*Tyrannus verticalis*	Low	Riparian, tree/shrubs	
Mourning dove	*Zenaida macroura*	High	Grassland	Abundant, nesting observed near substation

[1] Abundance:
Low: Fewer than five individuals in two or fewer locations
Moderate: Greater than five individuals in fewer than five locations
High: Greater than five individuals in greater than five locations

3.8 ADDITIONAL WILDLIFE OBSERVATIONS

The Project Area is within the primary range of pronghorn antelope (*Antilcapra americana*), mule deer (*Odocoileus hemionus*), and white-tailed deer (*Odocoileus virginanus*) (SDGFP 2014). All three species were observed in the Project Area, with pronghorn antelope the most abundant. White-tailed jack rabbit (*Lepus townsendii*), cottontail (*Sylvilagus* sp.), and black-tailed prairie dogs were observed in the Wildlife Survey Area. Only one jack rabbit was observed on the swift fox camera trap located at the solar farm. One cottontail was observed near the road on the west side of the Wildlife Survey Area. One small, 3 acre prairie dog colony was mapped to the south of the transmission line right-of-way (Figure 3). Sign of raccoon was observed under the Cheyenne River bridge.

The official USFWS species list for the Project Area did not indicate potential occurrence of black-footed ferret (*Mustela nigripes*). However, the species is listed as Threatened by SDGFP and is included on the Custer County species list. All current populations of black-footed ferret have resulted from reintroductions. The nearest known populations are to the west at Wind Cave National Park and to the northeast at Badlands National Park (SDGFP 2014). Black-footed ferrets feed primarily on prairie dogs and require black-tailed prairie dog colonies with an estimated 100-150 acres to support one ferret. Currently, suitable habitat is not present in the Wildlife Survey Area.

Reptiles observed in the Survey Area include prairie rattlesnake (*Crotalus viridis*), garter snake (*Thamnophis* sp.), and snapping turtle (*Chelydra serpentine*). No amphibians were observed in the Project Area.

4.0 CONCLUSION

The Habitat Assessment Area consists of approximately 82% cover by grasslands, 11% cover by croplands, 2% cover by riparian and wetlands, 2% by developed or disturbed areas, and 3% by other habitats. A total of 74 plant species were identified within the Project Area.

Nine terrestrial T&E species (five federally listed and four state-listed) and three state-listed fishes were identified as potentially occurring in the Project Area. In addition, 39 bird species protected under the MBTA were documented in the Wildlife Survey Area.

Of the five federally listed T&E species on the USFWS official species list, only the whooping crane and NLEB have potential to occur in the Project Area. Whooping crane occurrence would be limited to rare migrants using stop over habitat along the Cheyenne River and adjacent crop fields. Potential for whooping crane occurrence is considered very low. The Project Area is within the NLEB Area of Influence and suitable roosting and foraging habitat is present along wooded riparian corridors. However, no tree removal or direct impacts to any potential roost sites are expected to occur during Project construction. NLEB presence was not confirmed during acoustic surveys and the potential for occurrence is considered low.

State-listed T&E species including the swift fox, osprey, American dipper, and northern river otter have potential for occurrence in the Project Area. However, American dippers and northern river otters would only potentially occur in open water and streambank habitats of the Cheyenne River, which will be avoided by horizontal directional drilling under the river. No ospreys or their nests were documented during the survey; however, suitable habitat for the species is present along the Cheyenne River. No swift foxes or their sign were documented during surveys. However, the species has been reintroduced in Oglala Lakota County and is known to occur on the Pine Ridge Reservation. Although a low abundance of prey animals was observed in the Wildlife Survey Area and no sign of swift fox was observed, suitable habitat for the species is present in grasslands in the Project Area. No state-listed fishes will be affected by the Project.

Five raptor nests, including three active nests, were documented within 0.5 miles of the Project Area. The USFWS recommends spatial and seasonal buffers for breeding raptors, which include a 0.25 mile buffer for Swainson's hawk from April 1 to August 31, a 0.25 mile buffer for burrowing owl from April 1 to September 15, a 0.25 mile buffer for red-tailed hawk from February 1 to August 15, and a 0.125 mile buffer for great-horned owl from December 1 to September 30. As is shown in Table 4, there is an active burrowing owl nest and territory and an active Swainson's

hawk nest located within the USFWS recommended spatial buffers of 0.25 miles for these species. Avoidance of these areas may be needed to avoid disruption of breeding and a potential "take".

Seven additional migratory birds were confirmed as nesting in the Wildlife Survey Area including upland sandpiper, killdeer, mallard, Canada goose, cliff swallow (colony), American robin, and mourning dove. Nest activity may vary from year to year and additional birds are likely nesting, especially within the 840-acre solar farm site. Ground clearing activities during the migratory bird breeding season (typically May 1 to August 1) may result in "take" of migratory birds or their eggs unless clearance surveys are performed prior to construction or nesting habitat is removed outside of the breeding season.

5.0 REFERENCES

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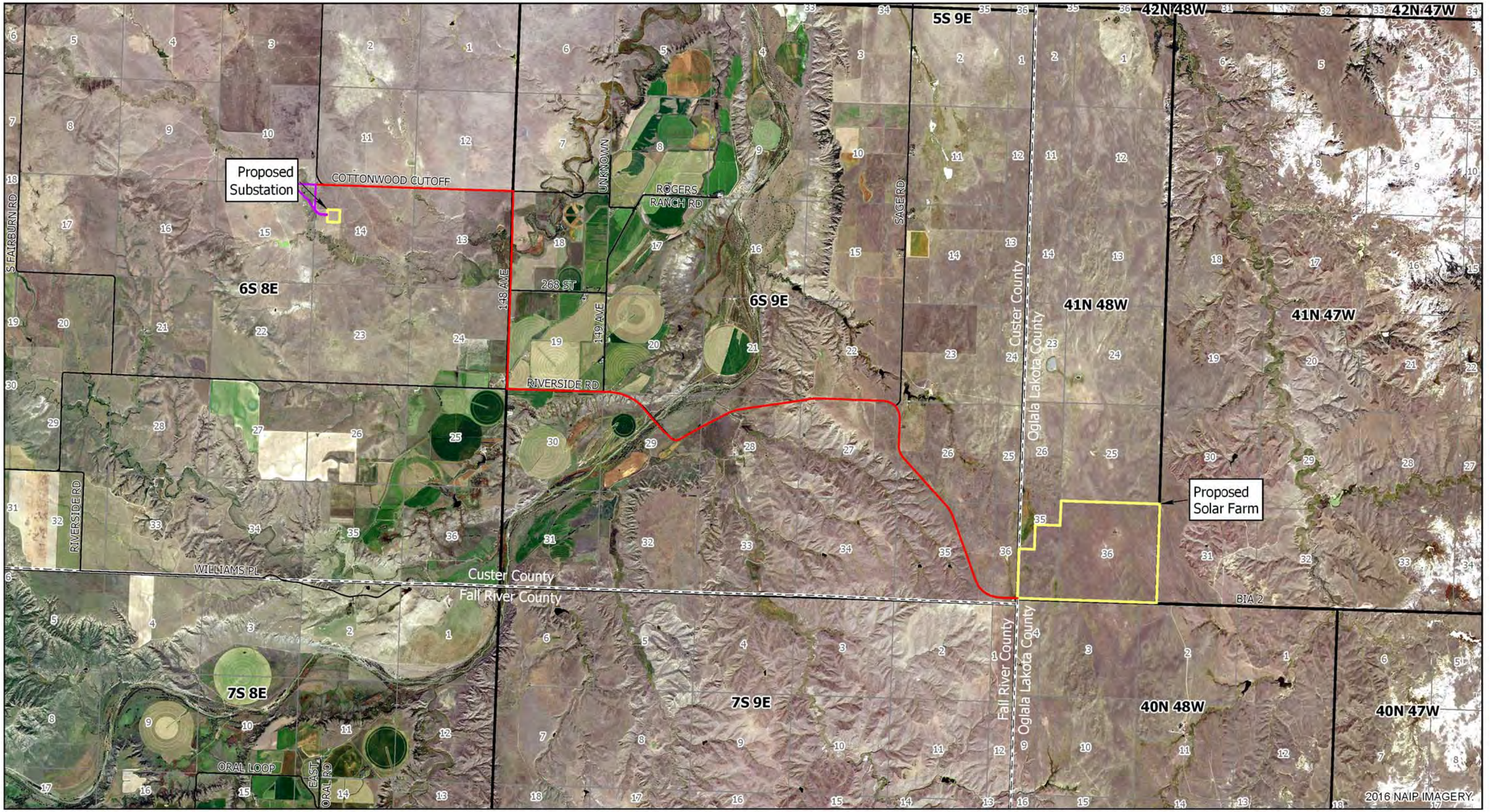
FIGURES



EXPLANATION

- PROPOSED POWERLINE
- PROPOSED ACCESS ROAD
- PROPERTY BOUNDARIES

N

0 1 Mile

Trihydro CORPORATION
1252 Commerce Drive
Laramie, WY 82070
www.trihydro.com
(P) 307.745.7474 (F) 307.745.7729

DRAFT

FIGURE 1

PROJECT AREA

BIOLOGICAL RESOURCE REPORT
LOOKOUT SOLAR PARK I, LLC
CUSTER & OGLALA LAKOTA COUNTIES, SD

Drawn By: BR	Checked By: ES	Scale: 1" = 1 Mile	Date: 7/31/18	File: Lookout_BiologicalResources.aprx

EXPLANATION

- PROPOSED POWERLINE
- PROPOSED ACCESS ROAD
- PROPERTY BOUNDARY
- 1/2 MILE BUFFER ZONE AROUND ACCESS ROAD, PROPERTY BOUNDARIES, AND POWER LINES
- 91 - RUDERAL FOREST
- 119 - WESTERN GREAT PLAINS WOODED DRAW AND RAVINE
- 143 - NORTHWESTERN GREAT PLAINS - BLACK HILLS PONDEROSA PINE WOODLAND AND SAVANNA
- 144 - ROCKY MOUNTAIN FOOTHILL LIMBER PINE-JUNIPER WOODLAND
- 193 - WESTERN GREAT PLAINS FLOODPLAIN SYSTEMS
- 325 - NORTHWESTERN GREAT PLAINS MIXEDGRASS PRAIRIE
- 328 - WESTERN GREAT PLAINS SAND PRAIRIE
- 329 - WESTERN GREAT PLAINS SANDHILL STEPPE
- 331 - WESTERN GREAT PLAINS SHORTGRASS PRAIRIE
- 422 - EASTERN GREAT PLAINS WET MEADOW, PRAIRIE AND MARSH
- 426 - WESTERN GREAT PLAINS DEPRESSIONAL WETLAND SYSTEMS
- 535 - WESTERN GREAT PLAINS BADLAND
- 556 - CULTIVATED CROPLAND
- 557 - PASTURE/HAY
- 559 - INTRODUCED UPLAND VEGETATION - PERENNIAL GRASSLAND AND FORBLAND
- 579 - OPEN WATER (FRESH)
- 581 - DEVELOPED, OPEN SPACE
- 582 - DEVELOPED, LOW INTENSITY
- 584 - DEVELOPED, HIGH INTENSITY

N

0 4,000 '

Tribydro CORPORATION
152 Commerce Drive
Laramie, WY 82070
www.trihydro.com
(P) 307.745.7474 (F) 307/745.7729

FIGURE 2

GAP DATA ECOLOGICAL SYSTEMS

BIOLOGICAL RESOURCE REPORT
LOOKOUT SOLAR PARK I, LLC
CUSTER & OGLALA LAKOTA COUNTIES, SD

Drawn By: DH	Checked By: ES	Scale: 1 " = 4,000 '	Date: 7/31/18	File: Fig2_GAP_EcoSystems.mxd

DRAFT

Cottonwood Creek

COTTONWOOD CUTOFF

Mourning Dove Nest Active

Fox Camera 2

Mallard Nest Active

Proposed Substation

Buteo nest inactive -2

Tributary Bat Detector

ROUSE CREEK

Angostora Canal

SWHA Active Nest

GRHO Active Nest

Cheyenne River

Buteo Nest Inactive - 1

Cheyenne Bat Detector

Cliff Swallow Active Colony

Robin Nest Active

BUOW Nest Active

Proposed Solar Farm

Sharp-tailed grouse (3X)

Fox Camera 1

Lame Johnny Creek

2016 NAIP IMAGERY

EXPLANATION

- BAT DETECTOR
- BIRD OBSERVATION
- FOX CAMERA
- RAPTOR NEST
- PROPOSED POWERLINE
- PROPOSED ACCESS ROAD

NATIONAL HYDROGRAPHY DATASET (USGS FEB. 2016)

- PERENNIAL STREAM
- INTERMITTENT STREAM
- RIGHT OF WAY BUFFER (33 & 50 FEET)
- 1/2 MILE BUFFER ZONE AROUND ACCESS ROAD, PROPERTY BOUNDARIES, AND POWER LINES
- BLACK-TAILED PRAIRIE DOG COLONY

N

0 2,000 4,000'

Trihydro Corporation
1252 Commerce Drive
Laramie, WY 82070
www.trihydro.com
(P) 307/745.7474 (F) 307/745.7729

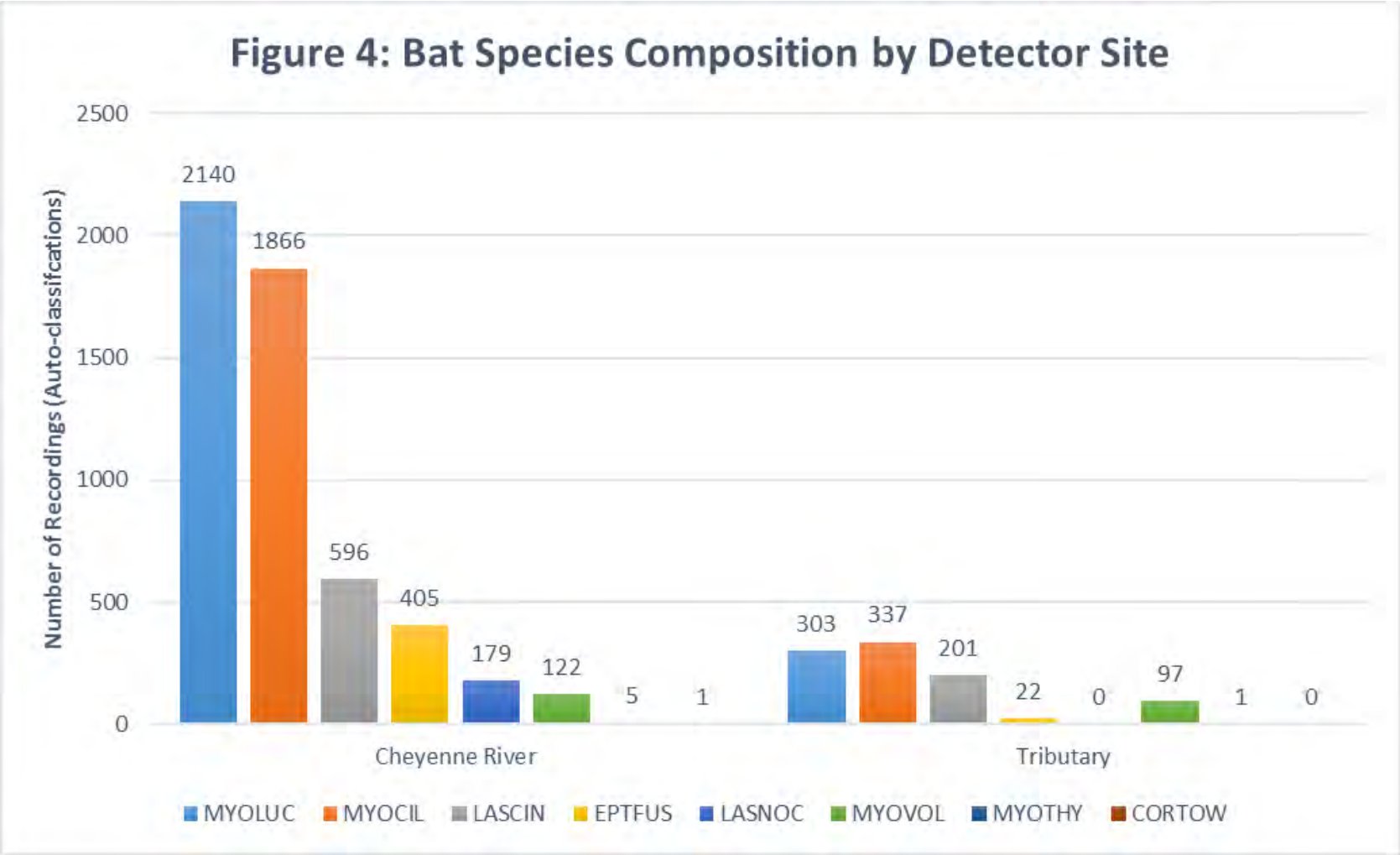
DRAFT

FIGURE 3

WILDLIFE OBSERVATIONS

BIOLOGICAL RESOURCE REPORT
LOOKOUT SOLAR PARK I, LLC
CUSTER & OGLALA LAKOTA COUNTIES, SD

Drawn By: BR	Checked By: SJ	Scale: 1" = 2,000'	Date: 7/31/18	File: Lookout_BiologicalResources.aprx



MYOLUC: *Myotis lucifigus* (little brown bat)

MYOCIL: *Myotis ciliolabrum* (western small-footed myotis)

LASCIN: *Lasiurus cinereus* (hoary bat)

EPTFUS: *Eptesicus fuscus* (big brown bat)

LASNOC: *Lasionycteris noctivagans* (silver-haired bat)

MYOVOL: *Myotis volans* (long-legged myotis)

MYOTHYL *Myotis thysanodes* (fringed myotis)

CORTOW: *Corynorhinus townsendii* (Townsend's big-eared bat)

APPENDIX A

USFWS OFFICIAL SPECIES LIST

United States Department of the Interior

FISH AND WILDLIFE SERVICE
South Dakota Ecological Services Field Office
420 South Garfield Avenue, Suite 400
Pierre, SD 57501-5408
Phone: (605) 224-8693 Fax: (605) 224-9974
http://www.fws.gov/southdakotafieldoffice/

In Reply Refer To:
Consultation Code: 06E14000-2018-SLI-0070
Event Code: 06E14000-2018-E-01115
Project Name: Lookout Solar

June 26, 2018

Subject: Updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Migratory Bird Treaty Act (16 U.S.C. 703-712, as amended), as well as the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.). Projects affecting these species may benefit from the development of an Eagle Conservation Plan (ECP), see guidance at this website (http://www.fws.gov/windenergy/eagle_guidance.html). An ECP can assist developers in achieving compliance with regulatory requirements, help avoid “take” of eagles at project sites, and provide biological support for eagle permit applications. Additionally, we recommend wind energy developments adhere to our Land-based Wind Energy Guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

We have recently updated our guidelines for minimizing impacts to migratory birds at projects that have communication towers (including meteorological, cellular, digital television, radio, and emergency broadcast towers). These guidelines can be found at:

http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm
http://www.towerkill.com

According to National Wetlands Inventory maps, (available online at http://wetlands.fws.gov/) wetlands exist adjacent to the proposed construction corridor. If a project may impact wetlands or other important fish and wildlife habitats, the U.S. Fish and Wildlife Service (Service), in accordance with the National Environmental Policy Act of 1969 (42 U.S.C. 4321-4347) and other environmental laws and rules, recommends complete avoidance of these areas, if possible. If this is not possible, attempts should be made to minimize adverse impacts. Finally if adverse impacts are unavoidable, measures should be undertaken to replace the impacted areas. Alternatives should be examined and the least damaging practical alternative selected. If wetland impacts are unavoidable, a mitigation plan addressing the number and types of wetland acres to be impacted, and the methods of replacement should be prepared and submitted to the resource agencies for review.

Please check with your local wetland management district to determine whether Service interest lands exist at the proposed project site, the exact locations of these properties, and any additional restrictions that may apply regarding these sites. The Offices are listed below. If you are not sure which office to contact, we can help you make that decision.

U.S. Fish and Wildlife Service, Huron Wetland Management District, Federal Building, Room 309, 200 4th Street SW, Huron, SD 57350; telephone (605) 352-5894. Counties in the Huron WMD: Beadle, Buffalo, Hand, Hughes, Hyde, Jerauld, Sanborn, Sully.

U.S. Fish and Wildlife Service, Lake Andes Wetland Management District, 38672 291st Street, Lake Andes, South Dakota; telephone (605) 487-7603. Counties in the Lake Andes WMD: Aurora, Bon Homme, Brule, Charles Mix, Clay, Davison, Douglas, Hanson, Hutchinson, Lincoln, Turner, Union, Yankton.

U.S. Fish and Wildlife Service, Madison Wetland Management District, P.O. Box 48, Madison, South Dakota, 57042, telephone (605) 256-2974. Counties in the Madison WMD: Brookings, Deuel, Hamlin, Kingsury, Lake, McCook, Miner, Minnehaha, Moody.

U.S. Fish and Wildlife Service, Sand Lake Wetland Management District, 39650 Sand Lake Drive, Columbia, South Dakota, 57433; telephone (605) 885-6320. Counties in the Sand Lake WMD: Brown, Campbell, Edmunds, Faulk, McPherson, Potter, Spink, Walworth.

U.S. Fish and Wildlife Service, Waubay Wetland Management District, 44401 134A Street, Waubay, South Dakota, 57273; telephone (605) 947-4521. Counties in the Waubay WMD: Clark, Codington, Day, Grant, Marshall, Roberts.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

You are welcome to visit our website (listed above) or to contact our office at the address or phone number above for more information.

Thank you.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Migratory Birds
- Wetlands

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

South Dakota Ecological Services Field Office
420 South Garfield Avenue, Suite 400
Pierre, SD 57501-5408
(605) 224-8693

Project Summary

Consultation Code: 06E14000-2018-SLI-0070

Event Code: 06E14000-2018-E-01115

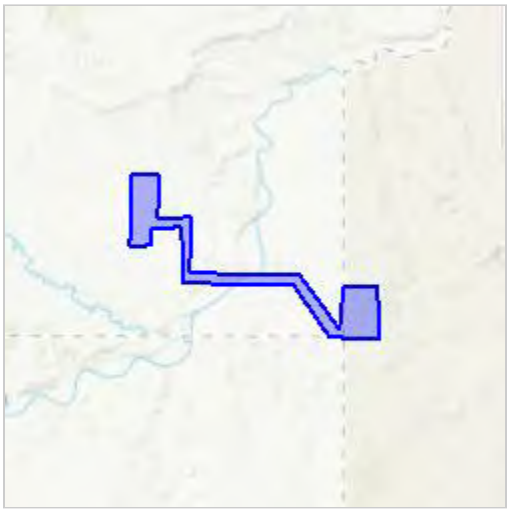
Project Name: Lookout Solar

Project Type: POWER GENERATION

Project Description: Solar Farm, powerline, and substation proposed for 2018

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/43.51567933862434N103.10663002018721W



Counties: Custer, SD | Fall River, SD | Oglala Lakota, SD

Endangered Species Act Species

There is a total of 4 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Birds

NAME	STATUS
Red Knot *Calidris canutus rufa* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1864	Threatened
Whooping Crane *Grus americana* Population: Wherever found, except where listed as an experimental population There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/758	Endangered

Flowering Plants

NAME	STATUS
Western Prairie Fringed Orchid *Platanthera praeclara*	Threatened

No critical habitat has been designated for this species.

Species profile: https://ecos.fws.gov/ecp/species/1669

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

---

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

THERE ARE NO FWS MIGRATORY BIRDS OF CONCERN WITHIN THE VICINITY OF YOUR PROJECT AREA.

Migratory Birds FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.
Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?
The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the E-bird Explore Data Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?
The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?
To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?
Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?
If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report
The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Wetlands

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

FRESHWATER EMERGENT WETLAND

- PEM1A
- PEM1Ah
- PEM1B
- PEM1C
- PEM1Ch
- PEM1Ax

FRESHWATER FORESTED/SHRUB WETLAND

- PFOA
- PSSA

FRESHWATER POND

- PABFh
- PUSAh
- PUSCh
- PUSC
- PUBFx

RIVERINE

- R4SBC
- R5UBH
- R2UBG
- R4SBCx

APPENDIX B

STATE LISTED T&E SPECIES DOCUMENTED IN SOUTH DAKOTA, BY COUNTY

State and Federally Listed Threatened, Endangered and Candidate Species Documented in South Dakota by County. Updated on 07/19/2016

The following list contains documented occurrences of both state and federally listed species by county in South Dakota. Records were compiled from the South Dakota Natural Heritage Database and expert knowledge of species occurrences. Please note that the absence of a species from a county list does not preclude its presence and that a listing of a historical record does not necessarily mean the species still occurs in that county.

Documentations of bird species consist of known breeding records with the exception of the whooping crane (*Grus americana*) for which all observations are included. However, please note that while the year-round distribution of the American dipper (*Cinclus mexicanus*) does not change, all other listed bird species may be found throughout the state during migration.

If more specific information is needed for a particular project site, please visit the following website to request a search of the Natural Heritage Database: http://gfp.sd.gov/wildlife/threatened-endangered/default.aspx

Species statuses include: FE = Federally Endangered, FT = Federally Threatened, PE = Proposed Endangered (Federal), PT = Proposed Threatened (Federal) C = Federal Candidate, SE = State Endangered, ST = State Threatened.

County	Common Name	Scientific Name	Status
Aurora	Topeka Shiner	*Notropis topeka*	FE
	Whooping Crane	*Grus americana*	FE, SE
Beadle	Topeka Shiner	*Notropis topeka*	FE
	Whooping Crane	*Grus americana*	FE, SE
	Northern River Otter	*Lontra canadensis*	ST
Bennett	Northern Pearl Dace	*Margariscus nachtriebi*	ST
	American Burying Beetle	*Nicrophorus americanus*	FE
	Northern Redbelly Dace	*Chrosomus eos*	ST
	Whooping Crane	*Grus americana*	FE, SE
	Swift Fox	*Vulpes velox*	ST
Bon Homme	Blacknose Shiner	*Notropis heterolepis*	SE
	Northern Redbelly Dace	*Chrosomus eos*	ST
	Pallid Sturgeon	*Scaphirhynchus albus*	FE, SE
	Shovelnose Sturgeon	*Scaphirhynchus platorynchus*	FT
	Sturgeon Chub	*Macrhybopsis gelida*	ST
	Sicklefin Chub	*Macrhybopsis meeki*	ST
	Topeka Shiner	*Notropis topeka*	FE
	False Map Turtle	*Graptemys pseudogeographica*	ST
	Interior Least Tern	*Sternula antillarum athalassos*	FE, SE
	Piping Plover	*Charadrius melodus*	FT, ST
	Whooping Crane	*Grus americana*	FE, SE

	Northern Long-eared Bat	*Myotis septentrionalis*	FT
	Northern River Otter	*Lontra canadensis*	ST
Brookings	American Burying Beetle	*Nicrophorus americanus*	FE
	Poweshiek Skipperling	*Oarisma poweshiek*	FE
	Dakota Skipper	*Hesperia dacotae*	FT
	Northern Redbelly Dace	*Chrosomus eos*	ST
	Topeka Shiner	*Notropis topeka*	FE
	Whooping Crane	*Grus americana*	FE, SE
	Northern River Otter	*Lontra canadensis*	ST
	Western Prairie Fringed Orchid	*Platanthera praeclara*	FT
Brown	Dakota Skipper	*Hesperia dacotae*	FT
	Topeka Shiner	*Notropis topeka*	FE
	Whooping Crane	*Grus americana*	FE, SE
	Northern River Otter	*Lontra canadensis*	ST
Brule	Northern Redbelly Dace	*Chrosomus eos*	ST
	Pallid Sturgeon	*Scaphirhynchus albus*	FE, SE
	Shovelnose Sturgeon	*Scaphirhynchus platorynchus*	FT
	Sturgeon Chub	*Macrhybopsis gelida*	ST
	Whooping Crane	*Grus americana*	FE, SE
	Northern Long-eared Bat	*Myotis septentrionalis*	FT
	Northern River Otter	*Lontra canadensis*	ST
Buffalo	Northern Redbelly Dace	*Chrosomus eos*	ST
	Pallid Sturgeon	*Scaphirhynchus albus*	FE, SE
	Shovelnose Sturgeon	*Scaphirhynchus platorynchus*	FT
	False Map Turtle	*Graptemys pseudogeographica*	ST
	Whooping Crane	*Grus americana*	FE, SE
	Northern River Otter	*Lontra canadensis*	ST
Butte	Finescale Dace	*Chrosomus neogaeus*	SE
	Longnose Sucker	*Catostomus catostomus*	ST
	Whooping Crane	*Grus americana*	FE, SE
	Northern River Otter	*Lontra canadensis*	ST
	Swift Fox	*Vulpes velox*	ST
Campbell	Pallid Sturgeon	*Scaphirhynchus albus*	FE, SE
	Shovelnose Sturgeon	*Scaphirhynchus platorynchus*	FT
	False Map Turtle	*Graptemys pseudogeographica*	ST
	Interior Least Tern	*Sternula antillarum athalassos*	FE, SE
	Piping Plover	*Charadrius melodus*	FT, ST
	Whooping Crane	*Grus americana*	FE, SE
Charles Mix	Banded Killifish	*Fundulus diaphanus*	SE
	Pallid Sturgeon	*Scaphirhynchus albus*	FE, SE
	Shovelnose Sturgeon	*Scaphirhynchus platorynchus*	FT
	Sicklefin Chub	*Macrhybopsis meeki*	ST

	Sturgeon Chub	*Macrhybopsis gelida*	ST
	False Map Turtle	*Graptemys pseudogeographica*	ST
	Interior Least Tern	*Sternula antillarum athalassos*	FE, SE
	Piping Plover	*Charadrius melodus*	FT, ST
	Whooping Crane	*Grus americana*	FE, SE
	Northern Long-eared Bat	*Myotis septentrionalis*	FT
Clark	Northern River Otter	*Lontra canadensis*	ST
Clay	Pallid Sturgeon	*Scaphirhynchus albus*	FE, SE
	Shovelnose Sturgeon	*Scaphirhynchus platorynchus*	FT
	Sicklefin Chub	*Macrhybopsis meeki*	ST
	Sturgeon Chub	*Macrhybopsis gelida*	ST
	Topeka Shiner	*Notropis topeka*	FE
	Eastern Hognose Snake	*Heterodon platirhinos*	ST
	False Map Turtle	*Graptemys pseudogeographica*	ST
	Interior Least Tern	*Sternula antillarum athalassos*	FE, SE
	Piping Plover	*Charadrius melodus*	FT, ST
	Northern Long-eared Bat	*Myotis septentrionalis*	FT
	Northern River Otter	*Lontra canadensis*	ST
Codington	Dakota Skipper	*Hesperia dacotae*	FT
	Poweshiek Skipperling	*Oarisma poweshiek*	FE
	Topeka Shiner	*Notropis topeka*	FE
	Piping Plover	*Charadrius melodus*	FT, ST
	Whooping Crane	*Grus americana*	FE, SE
	Northern River Otter	*Lontra canadensis*	ST
Corson	Northern Redbelly Dace	*Chrosomus eos*	ST
	Pallid Sturgeon	*Scaphirhynchus albus*	FE, SE
	Shovelnose Sturgeon	*Scaphirhynchus platorynchus*	FT
	Sicklefin Chub	*Macrhybopsis meeki*	ST
	Sturgeon Chub	*Macrhybopsis gelida*	ST
	False Map Turtle	*Graptemys pseudogeographica*	ST
	Interior Least Tern	*Sternula antillarum athalassos*	FE, SE
	Piping Plover	*Charadrius melodus*	FT, ST
	Whooping Crane	*Grus americana*	FE, SE
	Black-footed Ferret	*Mustela nigripes*	FE, SE
Custer	Blacknose Shiner	*Notropis heterolepis*	SE
	Longnose Sucker	*Catostomus catostomus*	ST
	Sturgeon Chub	*Macrhybopsis gelida*	ST
	American Dipper	*Cinclus mexicanus*	ST
	Osprey	*Pandion haliaetus*	ST
	Whooping Crane	*Grus americana*	FE, SE
	Black-footed Ferret	*Mustela nigripes*	FE, SE
	Northern Long-eared Bat	*Myotis septentrionalis*	FT
	Northern River Otter	*Lontra canadensis*	ST

	Swift Fox	*Vulpes velox*	ST
Davison	Topeka Shiner	*Notropis topeka*	FE
Day	Blacknose Shiner	*Notropis heterolepis*	SE
	Dakota Skipper	*Hesperia dacotae*	FT
	Poweshiek Skipperling	*Oarisma poweshiek*	FE
	Banded Killifish	*Fundulus diaphanus*	SE
	Piping Plover	*Charadrius melodus*	FT, ST
	Whooping Crane	*Grus americana*	FE, SE
	Northern River Otter	*Lontra canadensis*	ST
Deuel	Dakota Skipper	*Hesperia dacotae*	FT
	Poweshiek Skipperling	*Oarisma poweshiek*	FE
	Banded Killifish	*Fundulus diaphanus*	SE
	Northern Redbelly Dace	*Chrosomus eos*	ST
	Topeka Shiner	*Notropis topeka*	FE
	Northern River Otter	*Lontra canadensis*	ST
Dewey	Pallid Sturgeon	*Scaphirhynchus albus*	FE, SE
	Shovelnose Sturgeon	*Scaphirhynchus platorynchus*	FT
	Interior Least Tern	*Sternula antillarum athalassos*	FE, SE
	Piping Plover	*Charadrius melodus*	FT, ST
	Whooping Crane	*Grus americana*	FE, SE
	Black-footed Ferret	*Mustela nigripes*	FE, SE
Douglas	Whooping Crane	*Grus americana*	FE, SE
Edmunds	Whooping Crane	*Grus americana*	FE, SE
Fall River	Finescale Dace	*Chrosomus neogaeus*	SE
	Osprey	*Pandion haliaetus*	ST
	Swift Fox	*Vulpes velox*	ST
Faulk	Whooping Crane	*Grus americana*	FE, SE
Grant	Dakota Skipper	*Hesperia dacotae*	FT
	Poweshiek Skipperling	*Oarisma poweshiek*	FE
	Blacknose Shiner	*Notropis heterolepis*	SE
	Northern Redbelly Dace	*Chrosomus eos*	ST
	Osprey	*Pandion haliaetus*	ST
	Northern River Otter	*Lontra canadensis*	ST
Gregory	American Burying Beetle	*Nicrophorus americanus*	FE
	Northern Pearl Dace	*Margariscus nachtriebi*	ST
	Pallid Sturgeon	*Scaphirhynchus albus*	FE, SE
	Shovelnose Sturgeon	*Scaphirhynchus platorynchus*	FT
	Sicklefin Chub	*Macrhybopsis meeki*	ST
	Sturgeon Chub	*Macrhybopsis gelida*	ST
	False Map Turtle	*Graptemys pseudogeographica*	ST
	Piping Plover	*Charadrius melodus*	FT, ST
	Interior Least Tern	*Sternula antillarum athalassos*	FE, SE

	Whooping Crane	*Grus americana*	FE, SE
	Northern Long-eared Bat	*Myotis septentrionalis*	FT
Haakon	Sturgeon Chub	*Macrhybopsis gelida*	ST
	Interior Least Tern	*Sternula antillarum athalassos*	FE, SE
	Whooping Crane	*Grus americana*	FE, SE
	Northern River Otter	*Lontra canadensis*	ST
	Swift Fox	*Vulpes velox*	ST
Hamlin	Dakota Skipper	*Hesperia dacotae*	FT
	Poweshiek Skipperling	*Oarisma poweshiek*	FE
	Topeka Shiner	*Notropis topeka*	FE
	Northern River Otter	*Lontra canadensis*	ST
Hand	Whooping Crane	*Grus americana*	FE, SE
Hanson	Topeka Shiner	*Notropis topeka*	FE
	Northern River Otter	*Lontra canadensis*	ST
Harding	Sturgeon Chub	*Macrhybopsis gelida*	ST
	Peregrine Falcon	*Falco peregrinus*	SE
	Swift Fox	*Vulpes velox*	ST
Hughes	Pallid Sturgeon	*Scaphirhynchus albus*	FE, SE
	Shovelnose Sturgeon	*Scaphirhynchus platorynchus*	FT
	Sicklefin Chub	*Macrhybopsis meeki*	ST
	False Map Turtle	*Graptemys pseudogeographica*	ST
	Interior Least Tern	*Sternula antillarum athalassos*	FE, SE
	Piping Plover	*Charadrius melodus*	FT, ST
	Whooping Crane	*Grus americana*	FE, SE
	Northern Long-eared Bat	*Myotis septentrionalis*	FT
	Northern River Otter	*Lontra canadensis*	ST
	Swift Fox	*Vulpes velox*	ST
Hutchinson	Topeka Shiner	*Notropis topeka*	FE
	Whooping Crane	*Grus americana*	FE, SE
Hyde	Pallid Sturgeon	*Scaphirhynchus albus*	FE, SE
	Shovelnose Sturgeon	*Scaphirhynchus platorynchus*	FT
	Whooping Crane	*Grus americana*	FE, SE
	Swift Fox	*Vulpes velox*	ST
Jackson	Northern Redbelly Dace	*Chrosomus eos*	ST
	Sturgeon Chub	*Macrhybopsis gelida*	ST
	Whooping Crane	*Grus americana*	FE, SE
	Northern Long-eared Bat	*Myotis septentrionalis*	FT
	Swift Fox	*Vulpes velox*	ST
Jerauld	Whooping Crane	*Grus americana*	FE, SE
	Northern River Otter	*Lontra canadensis*	ST
Jones	Sturgeon Chub	*Macrhybopsis gelida*	ST
	Whooping Crane	*Grus americana*	FE, SE

Kingsbury	Piping Plover	*Charadrius melodus*	FT, ST
	Whooping Crane	*Grus americana*	FE, SE
Lake	Northern River Otter	*Lontra canadensis*	ST
Lawrence	Finescale Dace	*Chrosomus neogaeus*	SE
	Longnose Sucker	*Catostomus catostomus*	ST
	American Dipper	*Cinclus mexicanus*	ST
	Osprey	*Pandion haliaetus*	ST
	Northern Long-eared Bat	*Myotis septentrionalis*	LT
Lincoln	Northern Redbelly Dace	*Chrosomus eos*	ST
	Topeka Shiner	*Notropis topeka*	FE
	Lined Snake	*Tropidoclonion lineatum*	SE
	Northern River Otter	*Lontra canadensis*	ST
Lyman	Pallid Sturgeon	*Scaphirhynchus albus*	FE, SE
	Shovelnose Sturgeon	*Scaphirhynchus platorynchus*	FT
	Sturgeon Chub	*Macrhybopsis gelida*	ST
	False Map Turtle	*Graptemys pseudogeographica*	ST
	Whooping Crane	*Grus americana*	FE, SE
	Black-footed Ferret	*Mustela nigripes*	FE, SE
	Northern Long-eared Bat	*Myotis septentrionalis*	LT
	Northern River Otter	*Lontra canadensis*	ST
	Swift Fox	*Vulpes velox*	ST
Marshall	Dakota Skipper	*Hesperia dacotae*	FT
	Poweshiek Skipperling	*Oarisma poweshiek*	FE
	Whooping Crane	*Gus americana*	FE, SE
	Northern River Otter	*Lontra canadensis*	ST
McCook	Topeka Shiner	*Notropis topeka*	FE
	Northern River Otter	*Lontra canadensis*	ST
McPherson	Dakota Skipper	*Hesperia dacotae*	FT
	Banded Killifish	*Fundulus diaphanus*	SE
	Whooping Crane	*Grus americana*	FE, SE
Meade	Banded Killifish	*Fundulus diaphanus*	SE
	Longnose Sucker	*Catostomus catostomus*	ST
	Sturgeon Chub	*Macrhybopsis gelida*	ST
	American Dipper	*Cinclus mexicanus*	ST
	Interior Least Tern	*Sternula antillarum athalassos*	FE, SE
	Whooping Crane	*Grus americana*	FE, SE
	Northern Long-eared Bat	*Myotis septentrionalis*	LT
	Northern River Otter	*Lontra canadensis*	ST
	Swift Fox	*Vulpes velox*	ST
Mellette	Sturgeon Chub	*Macrhybopsis gelida*	ST
	Whooping Crane	*Grus americana*	FE, SE
Miner	Topeka Shiner	*Notropis topeka*	FE

	Whooping Crane	*Grus americana*	FE, SE
Minnehaha	Topeka Shiner	*Notropis topeka*	FE
	Lined Snake	*Tropidoclonion lineatum*	SE
	Northern River Otter	*Lontra canadensis*	ST
	Western Prairie Fringed Orchid	*Platanthera praeclara*	FT
Moody	Dakota Skipper	*Hesperia dacotae*	FT
	Poweshiek Skipperling	*Oarisma poweshiek*	FE
	Blacknose Shiner	*Notropis heterolepis*	SE
	Topeka Shiner	*Notropis topeka*	FE
	Northern River Otter	*Lontra canadensis*	ST
Oglala Lakota	Sturgeon Chub	*Macrhybopsis gelida*	ST
	Swift Fox	*Vulpes velox*	ST
Pennington	Longnose Sucker	*Catostomus catostomus*	ST
	Sturgeon Chub	*Macrhybopsis gelida*	ST
	American Dipper	*Cinclus mexicanus*	ST
	Interior Least Tern	*Sternula antillarum athalassos*	FE, SE
	Osprey	*Pandion haliaetus*	ST
	Peregrine Falcon	*Falco peregrinus*	SE
	Whooping Crane	*Grus americana*	FE, SE
	Black-footed Ferret	*Mustela nigripes*	FE, SE
	Northern Long-eared Bat	*Myotis septentrionalis*	LT
	Northern River Otter	*Lontra canadensis*	ST
	Swift Fox	*Vulpes velox*	ST
Perkins	Whooping Crane	*Grus americana*	FE, SE
	Northern Long-eared Bat	*Myotis septentrionalis*	LT
	Swift Fox	*Vulpes velox*	ST
Potter	Pallid Sturgeon	*Scaphirhynchus albus*	FE, SE
	Shovelnose Sturgeon	*Scaphirhynchus platorynchus*	FT
	Interior Least Tern	*Sternula antillarum athalassos*	FE, SE
	Piping Plover	*Charadrius melodus*	FT, ST
	Whooping Crane	*Grus americana*	FE, SE
Roberts	Dakota Skipper	*Hesperia dacotae*	FT
	Poweshiek Skipperling	*Oarisma poweshiek*	FE
	Blacknose Shiner	*Notropis heterolepis*	SE
	Osprey	*Pandion haliaetus*	ST
	Whooping Crane	*Grus americana*	FE, SE
	Northern River Otter	*Lontra canadensis*	ST
Sandborn	Topeka Shiner	*Notropis topeka*	FE
	Whooping Crane	*Grus americana*	FE, SE
	Northern River Otter	*Lontra canadensis*	ST
Spink	Whooping Crane	*Grus americana*	FE, SE
	Northern River Otter	*Lontra canadensis*	ST

	Swift Fox	*Vulpes velox*	ST
Stanley	Pallid Sturgeon	*Scaphirhynchus albus*	FE, SE
	Shovelnose Sturgeon	*Scaphirhynchus platorynchus*	FT
	Sicklefin Chub	*Macrhybopsis meeki*	ST
	False Map Turtle	*Graptemys pseudogeographica*	ST
	Interior Least Tern	*Sternula antillarum athalassos*	FE, SE
	Piping Plover	*Charadrius melodus*	FT, ST
	Whooping Crane	*Grus americana*	FE, SE
	Black-footed Ferret	*Mustela nigripes*	FE, SE
	Northern Long-eared Bat	*Myotis septentrionalis*	LT
	Northern River Otter	*Lontra canadensis*	ST
	Swift Fox	*Vulpes velox*	ST
Sully	Pallid Sturgeon	*Scaphirhynchus albus*	FE, SE
	Shovelnose Sturgeon	*Scaphirhynchus platorynchus*	FT
	Interior Least Tern	*Sternula antillarum athalassos*	FE, SE
	Piping Plover	*Charadrius melodus*	FT, ST
	Whooping Crane	*Grus americana*	FE, SE
	Northern River Otter	*Lontra canadensis*	ST
	Swift Fox	*Vulpes velox*	ST
Todd	American Burying Beetle	*Nicrophorus americanus*	FE
	Blacknose Shiner	*Notropis heterolepis*	SE
	Finescale Dace	*Chrosomus neogaeus*	SE
	Northern Pearl Dace	*Margariscus nachtriebi*	ST
	Northern Redbelly Dace	*Chrosomus eos*	ST
	Black-footed Ferret	*Mustela nigripes*	FE, SE
Tripp	American Burying Beetle	*Nicrophorus americanus*	FE
	Blacknose Shiner	*Notropis heterolepis*	SE
	Northern Pearl Dace	*Margariscus nachtriebi*	ST
	Northern Redbelly Dace	*Chrosomus eos*	ST
	Sturgeon Chub	*Macrhybopsis gelida*	ST
	Whooping Crane	*Grus americana*	FE, SE
	Northern River Otter	*Lontra canadensis*	ST
Turner	Northern Redbelly Dace	*Chrosomus eos*	ST
	Topeka Shiner	*Notropis topeka*	FE
Union	American Burying Beetle	*Nicrophorus americanus*	FE
	Pallid Sturgeon	*Scaphirhynchus albus*	FE, SE
	Shovelnose Sturgeon	*Scaphirhynchus platorynchus*	FT
	Finescale Dace	*Chrosomus neogaeus*	SE
	Sturgeon Chub	*Macrhybopsis gelida*	ST
	Sicklefin Chub	*Macrhybopsis meeki*	ST
	Eastern Hognose Snake	*Heterodon platirhinos*	ST
	False Map Turtle	*Graptemys pseudogeographica*	ST
	Lined Snake	*Tropidoclonion lineatum*	SE

	Interior Least Tern	*Sternula antillarum athalassos*	FE, SE
	Piping Plover	*Charadrius melodus*	FT, ST
	Northern Long-eared Bat	*Myotis septentrionalis*	LT
	Northern River Otter	*Lontra canadensis*	ST
Walworth	Northern Redbelly Dace	*Chrosomus eos*	ST
	Pallid Sturgeon	*Scaphirhynchus albus*	FE, SE
	Shovelnose Sturgeon	*Scaphirhynchus platorynchus*	FT
	Sturgeon Chub	*Macrhybopsis gelida*	ST
	Sicklefin Chub	*Macrhybopsis meeki*	ST
	Interior Least Tern	*Sternula antillarum athalassos*	FE, SE
	Piping Plover	*Charadrius melodus*	FT, ST
	Whooping Crane	*Grus americana*	FE, SE
	Northern Long-eared Bat	*Myotis septentrionalis*	LT
Yankton	Higgins Eye	*Lampsilis higginsii*	FE
	Scaleshell	*Leptodea leptodon*	FE
	Pallid Sturgeon	*Scaphirhynchus albus*	FE, SE
	Shovelnose Sturgeon	*Scaphirhynchus platorynchus*	FT
	Sicklefin Chub	*Macrhybopsis meeki*	ST
	Sturgeon Chub	*Macrhybopsis gelida*	ST
	Eastern Hognose Snake	*Heterodon platirhinos*	ST
	False Map Turtle	*Graptemys pseudogeographica*	ST
	Interior Least Tern	*Sternula antillarum athalassos*	FE, SE
	Piping Plover	*Charadrius melodus*	FT, ST
	Northern Long-eared Bat	*Myotis septentrionalis*	LT
	Northern River Otter	*Lontra canadensis*	ST
Ziebach	Sturgeon Chub	*Macrhybopsis gelida*	ST
	Interior Least Tern	*Sternula antillarum athalassos*	FE, SE
	Black-footed Ferret	*Mustela nigripes*	FE, SE
	Swift Fox	*Vulpes velox*	ST
	Whooping Crane	*Grus americana*	FE, SE

APPENDIX C

PHOTOGRAPH LOG

APPENDIX C. PHOTOGRAPH LOG
BIOLOGICAL RESOURCE REPORT
LOOKOUT SOLAR PROJECT, CUSTER AND OGLALA LAKOTA COUNTIES, SOUTH DAKOTA

Photo 1. Adult Burrowing owl

Photo 2. Burrowing owl nest, prairie dog burrow

Photo 3. Buteo nest 1

Photo 4. Buteo nest 2

Photo 5. Cheyenne bat detector

Photo 6. Cheyenne River bridge

Photo 7. Cliff Swallow colony, Cheyenne Bridge

Photo 8. Cropland

Photo 9. Emergent wetland – closed depression

Photo 10. Grassland - substation

Photo 11. Great-horned owl adult perched above nest

Photo 12. Great-horned owl fledgling near nest

Photo 13. Long-billed Curlew

Photo 14. Potential Northern long-eared bat habitat - tributary

Photo 15. Riparian corridor – Cheyenne River

Photo 16. Riparian habitat

Photo 17. Robin nest

Photo 18. Sand sagebrush patch – solar farm

Photo 19. Sharp-tailed grouse

Photo 20. Shrub-scrub wetland

Photo 21. Snapping Turtle

Photo 22. Solar farm - grassland

Photo 23. Swainson Hawk nest

Photo 24. Swainson Hawk

Photo 25. Tributary bat detector location

Photo 26. Yellow-billed Cuckoo