

**NOTTINGHAM SOLAR SITE WETLAND DELINEATION**

**PHOTOGRAPH 11**



Wetland NS-6 (PEM) facing north on January 12, 2021.

**PHOTOGRAPH 12**



Wetland NS-6 (PEM) facing east on January 12, 2021.

**NOTTINGHAM SOLAR SITE WETLAND DELINEATION**

**PHOTOGRAPH 13**



Wetland NS-7 (PEM) facing south on January 12, 2021.

**PHOTOGRAPH 14**



Wetland NS-7 (PEM) facing east on January 12, 2021.

**NOTTINGHAM SOLAR SITE WETLAND DELINEATION**

**PHOTOGRAPH 15**



Wetland NS-8 (PEM) facing west on January 13, 2021.

**PHOTOGRAPH 16**



Wetland NS-8 (PEM) facing east on January 13, 2021.

**NOTTINGHAM SOLAR SITE WETLAND DELINEATION**

**PHOTOGRAPH 17**



Wetland NS-9 (PEM) facing north on January 13, 2021.

**PHOTOGRAPH 18**



Wetland NS-10 (PEM) facing north on January 13, 2021.

**NOTTINGHAM SOLAR SITE WETLAND DELINEATION**

**PHOTOGRAPH 19**



Wetland NS-10 (PEM) facing east on January 13, 2021.

**PHOTOGRAPH 20**



Wetland NS-10 (PSS) facing south on January 13, 2021.

**NOTTINGHAM SOLAR SITE WETLAND DELINEATION**

**PHOTOGRAPH 21**



Wetland NS-11 (PEM) facing north on January 13, 2021.

**PHOTOGRAPH 22**



Wetland NS-11 (PEM) facing south on January 13, 2021.

**NOTTINGHAM SOLAR SITE WETLAND DELINEATION**

**PHOTOGRAPH 23**



Wetland NS-12 (PEM) facing east on January 13, 2021.

**PHOTOGRAPH 24**



Wetland NS-12 (PEM) facing west on January 13, 2021.

**NOTTINGHAM SOLAR SITE WETLAND DELINEATION**

**PHOTOGRAPH 25**



Wetland NS-13 (PEM) facing west on January 13, 2021.

**PHOTOGRAPH 26**



Wetland NS-13 (PEM) facing east on January 13, 2021.



**NOTTINGHAM SOLAR SITE WETLAND DELINEATION**

**PHOTOGRAPH 27**



Wetland NS-14 (PSS) facing north on January 12, 2021.

**PHOTOGRAPH 28**



Wetland NS-14 (PEM) facing east on January 12, 2021.

**NOTTINGHAM SOLAR SITE WETLAND DELINEATION**

**PHOTOGRAPH 29**



Wetland NS-15 (PEM) facing north on January 12, 2021.

**PHOTOGRAPH 30**



Wetland NS-16 (PEM) facing east on January 12, 2021.

**NOTTINGHAM SOLAR SITE WETLAND DELINEATION**

**PHOTOGRAPH 31**



Wetland NS-17 (PEM) facing east on January 13, 2021.

**PHOTOGRAPH 32**



Wetland NS-17 (PEM) facing south on January 13, 2021.

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**PHOTOGRAPH 33**



Wetland NS-18 (PEM) facing east on January 12, 2021.

**PHOTOGRAPH 34**



Wetland NS-18 (PEM) facing south on January 12, 2021.

**NOTTINGHAM SOLAR SITE WETLAND DELINEATION**

**PHOTOGRAPH 35**



Wetland NS-19 (PEM) facing west on January 13, 2021.

**PHOTOGRAPH 36**



Wetland NS-19 (PEM) facing east on January 13, 2021.

**NOTTINGHAM SOLAR SITE WETLAND DELINEATION**

**PHOTOGRAPH 37**



Wetland NS-20 (PEM) facing south on January 13, 2021.

**PHOTOGRAPH 38**



Wetland NS-20 (PEM) facing north on January 13, 2021.

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**PHOTOGRAPH 39**



Wetland NS-21 (PSS) facing north on March 16, 2021.

**PHOTOGRAPH 40**



Wetland NS-21 (PSS) facing south on March 16, 2021.

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**PHOTOGRAPH 41**



Wetland NS-22 (PEM) facing west on March 16, 2021.

**PHOTOGRAPH 42**



Wetland NS-22 (PEM) facing north on March 16, 2021.



**NOTTINGHAM SOLAR SITE WETLAND DELINEATION**

**PHOTOGRAPH 43**



Wetland NS-23 (PEM) facing north on March 16, 2021.

**PHOTOGRAPH 44**



Wetland NS-23 (PEM) facing south on March 16, 2021.

PHOTOGRAPH 45



Stream NS-1 (ephemeral) substrate on January 12, 2021.

PHOTOGRAPH 46



Stream NS-2 (ephemeral) facing upstream on January 12, 2021.

PHOTOGRAPH 47



Stream NS-2 (ephemeral) facing downstream on January 12, 2021.

PHOTOGRAPH 48



Stream NS-2 (ephemeral) substrate on January 12, 2021.

PHOTOGRAPH 49



Stream NS-3 (ephemeral) facing upstream on January 12, 2021.

PHOTOGRAPH 50



Stream NS-3 (ephemeral) facing downstream on January 12, 2021.

PHOTOGRAPH 51



Stream NS-3 (ephemeral) substrate on January 12, 2021.

PHOTOGRAPH 52



Stream NS-4 (ephemeral) facing upstream on January 12, 2021.

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**PHOTOGRAPH 53**



Stream NS-4 (ephemeral) facing downstream on January 12, 2021.

**PHOTOGRAPH 54**



Stream NS-4 (ephemeral) substrate on January 12, 2021.

PHOTOGRAPH 55



Stream NS-5 (intermittent) facing upstream on January 13, 2021.

PHOTOGRAPH 56



Stream NS-5 (intermittent) facing downstream on January 13, 2021.

PHOTOGRAPH 57



Stream NS-5 (intermittent) substrate on January 13, 2021.

PHOTOGRAPH 58



Stream NS-6a (ephemeral) facing upstream on January 13, 2021.



**NOTTINGHAM SOLAR SITE WETLAND DELINEATION**

**PHOTOGRAPH 59**



Stream NS-6a (ephemeral) facing downstream on January 13, 2021.

**PHOTOGRAPH 60**



Stream NS-6b (ephemeral) facing upstream on January 13, 2021.

PHOTOGRAPH 61



Stream NS-6b (ephemeral) facing downstream on January 13, 2021.

PHOTOGRAPH 62



Stream NS-6a (ephemeral) substrate on January 13, 2021.

PHOTOGRAPH 63



Stream NS-7 (ephemeral) facing upstream on January 13, 2021.

PHOTOGRAPH 64



Stream NS-7 (ephemeral) facing downstream on January 13, 2021.

PHOTOGRAPH 65



Stream NS-7 (ephemeral) substrate on January 13, 2021.

PHOTOGRAPH 66



Stream NS-8 (ephemeral) facing upstream on January 13, 2021.

**NOTTINGHAM SOLAR SITE WETLAND DELINEATION**

**PHOTOGRAPH 67**



Stream NS-8 (ephemeral) facing downstream on January 13, 2021.

**PHOTOGRAPH 68**



Stream NS-8 (ephemeral) substrate on January 13, 2021.

PHOTOGRAPH 69



Stream NS-9 (ephemeral) facing downstream on March 16, 2021.

PHOTOGRAPH 70



Stream NS-9 (ephemeral) substrate on March 16, 2021.

**NOTTINGHAM SOLAR SITE WETLAND DELINEATION**

**PHOTOGRAPH 71**



Stream NS-9 (ephemeral) facing downstream on March 16, 2021.

**PHOTOGRAPH 72**



Stream NS-10 (intermittent) substrate on March 16, 2021.

PHOTOGRAPH 73



Stream NS-10 (intermittent) facing downstream on March 16, 2021.

PHOTOGRAPH 74



Stream NS-10 (intermittent) substrate on March 16, 2021.



**NOTTINGHAM SOLAR SITE WETLAND DELINEATION**

**PHOTOGRAPH 75**



Pond NS-1 facing north on January 13, 2021.

**PHOTOGRAPH 76**



Pond NS-2 facing south on January 12, 2021.

**NOTTINGHAM SOLAR SITE WETLAND DELINEATION**

**PHOTOGRAPH 77**



Pond NS-3 facing west on January 13, 2021.

**PHOTOGRAPH 78**



Pond NS-4 facing south on January 13, 2021.

PHOTOGRAPH 79



Upland NS-1 facing south on January 13, 2021.

PHOTOGRAPH 80



Upland NS-2 facing south on January 13, 2021.

**NOTTINGHAM SOLAR SITE WETLAND DELINEATION**

**PHOTOGRAPH 81**



Upland NS-3 facing south on January 13, 2021.

**PHOTOGRAPH 82**



Upland NS-4 facing south on January 12, 2021.

**NOTTINGHAM SOLAR SITE WETLAND DELINEATION**

**PHOTOGRAPH 83**



Upland NS-5 facing south on January 12, 2021.

**PHOTOGRAPH 84**



Upland NS-6 facing west on January 12, 2021.

**NOTTINGHAM SOLAR SITE WETLAND DELINEATION**

**PHOTOGRAPH 85**



Upland NS-7 facing east on January 12, 2021.

**PHOTOGRAPH 86**



Upland NS-8 facing south on January 13, 2021.

**NOTTINGHAM SOLAR SITE WETLAND DELINEATION**

**PHOTOGRAPH 87**



Upland NS-9 facing north on January 13, 2021.

**PHOTOGRAPH 88**



Upland NS-10 facing north on January 13, 2021.

**NOTTINGHAM SOLAR SITE WETLAND DELINEATION**

**PHOTOGRAPH 89**



Upland NS-11 facing east on January 13, 2021.

**PHOTOGRAPH 90**



Upland NS-12 facing west on January 13, 2021.



**NOTTINGHAM SOLAR SITE WETLAND DELINEATION**

**PHOTOGRAPH 91**



Upland NS-13 facing south on January 13, 2021.

**PHOTOGRAPH 92**



Upland NS-14 facing north on January 12, 2021.

**NOTTINGHAM SOLAR SITE WETLAND DELINEATION**

**PHOTOGRAPH 93**



Upland NS-15 facing southeast on January 12, 2021.

**PHOTOGRAPH 94**



Upland NS-16 facing north on January 12, 2021.

**NOTTINGHAM SOLAR SITE WETLAND DELINEATION**

**PHOTOGRAPH 95**



Upland NS-17 facing east on January 13, 2021.

**PHOTOGRAPH 96**



Upland NS-18 facing northeast on January 12, 2021.

**NOTTINGHAM SOLAR SITE WETLAND DELINEATION**

**PHOTOGRAPH 97**



Upland NS-19 facing east on January 13, 2021.

**PHOTOGRAPH 98**



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Upland NS-20 facing east on January 13, 2021.

**NOTTINGHAM SOLAR SITE WETLAND DELINEATION**

**PHOTOGRAPH 99**



Upland NS-21 facing north on March 16, 2021.

**PHOTOGRAPH 100**



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Upland NS-22 facing north on March 16, 2021.

PHOTOGRAPH 101



Upland NS-23 facing north on March 16, 2021.

# APPENDIX G

## AGENCY COORDINATION

## Renner, Philip

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**From:** Ohio, FW3 <ohio@fws.gov>  
**Sent:** Friday, December 11, 2020 9:24 AM  
**To:** Renner, Philip  
**Cc:** nathan.reardon@dnr.state.oh.us; Parsons, Kate; Thomayer, Matthew; Fox, Sean; mretterer@pheasantsforever.org; Stevenson, Lori  
**Subject:** Nottingham Solar LLC - Nottingham Solar Site, Athens Township, Harrison County, Ohio  
**Attachments:** Ohio Solar Site Pollinator Habitat Planning and Assessment Form v.9 FINAL\_5\_3\_2018.pdf



UNITED STATES DEPARTMENT OF THE INTERIOR  
U.S. Fish and Wildlife Service  
Ecological Services Office  
4625 Morse Road, Suite 104  
Columbus, Ohio 43230  
(614) 416-8993 / Fax (614) 416-8994



TAILS# 03E15000-2021-TA-0437

Dear Mr. Renner,

The U.S Fish and Wildlife Service (Service) has received your recent correspondence requesting information about the subject proposal. We offer the following comments and recommendations to assist you in minimizing and avoiding adverse impacts to threatened and endangered species pursuant to the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq), as amended (ESA).

**Federally Threatened and Endangered Species:** The endangered Indiana bat (*Myotis sodalis*) and threatened northern long-eared bat (*Myotis septentrionalis*) occur throughout the State of Ohio. The Indiana bat and northern long-eared bat may be found wherever suitable habitat occurs unless a presence/absence survey has been performed to document absence. Suitable summer habitat for Indiana bats and northern long-eared bats consists of a wide variety of forested/wooded habitats where they roost, forage, and breed that may also include adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, woodlots, fallow fields, and pastures. Roost trees for both species include live and standing dead trees  $\geq 3$  inches diameter at breast height (dbh) that have any exfoliating bark, cracks, crevices, hollows and/or cavities. These roost trees may be located in forested habitats as well as linear features such as fencerows, riparian forests, and other wooded corridors. Individual trees may be considered suitable habitat when they exhibit the characteristics of a potential roost tree and are located within 1,000 feet of other forested/wooded habitat. Northern long-eared bats have also been observed roosting in human-made structures, such as buildings, barns, bridges, and bat houses; therefore, these structures should also be considered potential summer habitat. In the winter, Indiana bats and northern long-eared bats hibernate in caves, rock crevices and abandoned mines.

**Seasonal Tree Clearing for Federally Listed Bat Species:** Should the proposed project site contain trees  $\geq 3$  inches dbh, we recommend avoiding tree removal wherever possible. If any caves or abandoned mines may be disturbed, further coordination with this office is requested to determine if fall or spring portal surveys are warranted. If no caves or abandoned mines are present and trees  $\geq 3$  inches dbh cannot be avoided, we recommend removal of any trees  $\geq 3$  inches dbh only occur between October 1 and March 31. Seasonal clearing is recommended to avoid adverse effects to Indiana bats and northern long-eared bats. While incidental take of



northern long-eared bats from most tree clearing is exempted by a 4(d) rule (see <http://www.fws.gov/midwest/endangered/mammals/nleb/index.html>), incidental take of Indiana bats is still prohibited without a project-specific exemption. Thus, seasonal clearing is recommended where Indiana bats are assumed present.

If implementation of this seasonal tree cutting recommendation is not possible, a summer presence/absence survey may be conducted for Indiana bats. If Indiana bats are not detected during the survey, then tree clearing may occur at any time of the year. Surveys must be conducted by an approved surveyor and be designed and conducted in coordination with the Ohio Field Office. Surveyors must have a valid federal permit. Please note that in Ohio summer mist net surveys may only be conducted between June 1 and August 15.

**POLLINATOR COMMENTS:**

The Service is working closely with our partners at Ohio Pollinator Habitat Initiative (OPHI) to create and enhance pollinator habitat at solar power installations. Attached for your use is the Ohio Solar Site Pollinator Habitat Planning and Assessment Form. This form was developed by the OPHI Solar Pollinator Program Advisory Team. We recommend that the areas between the solar panels be planted with legumes and wildflowers (i.e. forbs) that are beneficial to pollinators and other wildlife instead of non-native grass. Pollinators are beneficial to agricultural communities like the project area because they pollinate many varieties of fruits and vegetables. The recommended legumes and forbs are short (low growing) so as not to cast shadows on the solar panels and would only require one to two mowings a year for maintenance, which should allow the project proponent to minimize maintenance costs. For other areas of the installation where vegetation does not have to be low-growing, alternative pollinator mixes are available with a more diverse array of flowering plants. This perennial vegetation will provide beneficial foraging habitat to songbirds and pollinators (e.g., monarch butterfly and the federally listed rusty patched bumblebee) while reducing storm water runoff, standing water, and erosion. Native plants can act as host plants for insect larva while flowering plants provide nectar sources for adult butterflies as well as other pollinators such as hummingbirds. Seeds from these plants can also provide food for a wide variety of bird species. Please contact the Ohio Pollinator Habitat Initiative ( <http://www.ophi.info/> ), and specifically, Mike Retterer, [mretterer@pheasantsforever.org](mailto:mretterer@pheasantsforever.org) for information on solar power facility pollinator plantings.

Recommended low-growing grasses and forbs may include:

Little Bluestem	<i>Schizachyrium scoparium</i>
Sideoats Grama	<i>Bouteloua curtipendula</i>
Alfalfa	<i>Medicago spp.</i>
Alsike Clover	<i>Trifolium hybridum</i>
Brown-eyed Susan	<i>Rudbeckia triloba</i>
Butterfly Milkweed	<i>Asclepias tuberosa</i>
Lanceleaf Coreopsis	<i>Coreopsis lanceolata</i>
Partridge Pea	<i>Chamaecrista fasciculata</i>
Timothy	<i>Phleum pratense</i>
Orchardgrass	<i>Dactylis glomerata</i>
Crimson Clover	<i>Trifolium incarnatum</i>
Ladino or White Clover	<i>Trifolium repens</i>

Section 7 Coordination: If there is a federal nexus for the project (e.g., federal funding provided, federal permits required to construct), then no tree clearing should occur on any portion of the project area until consultation under section 7 of the ESA, between the Service and the federal action agency, is completed. We recommend the federal action agency submit a determination of effects to this office, relative to the Indiana bat and northern long-eared bat, for our review and concurrence. This letter provides technical assistance only and does not serve as a completed section 7 consultation document.

Stream and Wetland Avoidance: Over 90% of the wetlands in Ohio have been drained, filled, or modified by human activities, thus it is important to conserve the functions and values of the remaining wetlands in Ohio ([https://epa.ohio.gov/portals/47/facts/ohio\\_wetlands.pdf](https://epa.ohio.gov/portals/47/facts/ohio_wetlands.pdf)). We recommend avoiding and minimizing project impacts to all wetland habitats (e.g., forests, streams, vernal pools) to the maximum extent possible in order to benefit water quality and fish and wildlife habitat. Additionally, natural buffers around streams and wetlands should be preserved to enhance beneficial functions. If streams or wetlands will be impacted, the U.S. Army Corps of Engineers should be contacted to determine whether a Clean Water Act section 404 permit is required. Best management practices should be used to minimize erosion, especially on slopes. Disturbed areas should be mulched and revegetated with native plant species. In addition, prevention of non-native, invasive plant establishment is critical in maintaining high quality habitats.

Due to the project type, size, and location, we do not anticipate adverse effects to any other federally endangered, threatened, or proposed species, or proposed or designated critical habitat. Should the project design change, or additional information on listed or proposed species or their critical habitat become available, or if new information reveals effects of the action that were not previously considered, coordination with the Service should be initiated to assess any potential impacts.

Thank you for your efforts to conserve listed species and sensitive habitats in Ohio. We recommend coordinating with the Ohio Department of Natural Resources due to the potential for the proposed project to affect state listed species and/or state lands. Contact Mike Pettegrew, Acting Environmental Services Administrator, at (614) 265-6387 or at [mike.pettegrew@dnr.state.oh.us](mailto:mike.pettegrew@dnr.state.oh.us).

If you have questions, or if we can be of further assistance in this matter, please contact our office at (614) 416-8993 or [ohio@fws.gov](mailto:ohio@fws.gov).

Sincerely,



Patrice Ashfield  
Field Office Supervisor

cc: Nathan Reardon, ODNR-DOW  
Kate Parsons, ODNR-DOW





# Ohio Department of Natural Resources

MIKE DEWINE, GOVERNOR

MARY MERTZ, DIRECTOR

## Office of Real Estate

*John Kessler, Chief*  
2045 Morse Road – Bldg. E-2  
Columbus, OH 43229  
Phone: (614) 265-6621  
Fax: (614) 267-4764

February 8, 2021

Philip Renner  
WSP USA  
312 Elm Street, Suite 2500  
Cincinnati, Ohio 45202

**Re:** 21-0017; Nottingham Solar LLC Nottingham Site

**Project:** The proposed project involves the construction of a utility-scale solar photovoltaic generation facility on approximately 924 acres.

**Location:** The proposed project is located in Athens Township, Harrison County, Ohio.

The Ohio Department of Natural Resources (ODNR) has completed a review of the above referenced project. These comments were generated by an inter-disciplinary review within the Department. These comments have been prepared under the authority of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), the National Environmental Policy Act, the Coastal Zone Management Act, Ohio Revised Code and other applicable laws and regulations. These comments are also based on ODNR's experience as the state natural resource management agency and do not supersede or replace the regulatory authority of any local, state or federal agency nor relieve the applicant of the obligation to comply with any local, state or federal laws or regulations.

**Natural Heritage Database:** The Natural Heritage Database has the following record at or within a one-mile radius of the project area:

Jockey Hollow Wildlife Area – ODNR Division of Wildlife

The review was performed on the project area you specified in your request as well as an additional one-mile radius. Records searched date from 1980. This information is provided to inform you of features present within your project area and vicinity.

Please note that Ohio has not been completely surveyed and we rely on receiving information from many sources. Therefore, a lack of records for any particular area is not a statement that rare species or unique features are absent from that area. Although all types of plant communities have been surveyed, we only maintain records on the highest quality areas.

**Fish and Wildlife:** The Division of Wildlife (DOW) has the following comments.

The DOW recommends that impacts to streams, wetlands and other water resources be avoided and minimized to the fullest extent possible, and that best management practices be utilized to minimize erosion and sedimentation.

The Division of Wildlife is working closely with our partners at Ohio Pollinator Habitat Initiative (OPHI) to create and enhance pollinator habitat at solar power installations. Attached for your use is the Ohio Solar Site Pollinator Habitat Planning and Assessment Form. This form was developed by the OPHI Solar Pollinator Program Advisory Team. We recommend that the areas between and around the solar panels be planted with legumes and wildflowers (i.e., forbs) that are beneficial to pollinators and other wildlife and reduce use of non-native grass and gravel. The recommended legumes and forbs listed below are low growing so as not to cast shadows on the solar panels and would only require one to two mowings a year for maintenance, which should minimize maintenance costs. For other areas of the installation where vegetation does not have to be low-growing, alternative pollinator mixes are available with a more diverse array of flowering plants. This perennial vegetation will provide beneficial foraging habitat to songbirds and pollinators while reducing storm water runoff, standing water, and erosion. Please contact the Ohio Pollinator Habitat Initiative <http://www.ophi.info/>, and specifically Mike Retterer [mretterer@pheasantsforever.org](mailto:mretterer@pheasantsforever.org) for further information on solar power facility pollinator plantings.

Recommended low-growing grasses and forbs may include:

Little Bluestem	<i>Schizachyrium scoparium</i>
Sideoats Grama	<i>Bouteloua curtipendula</i>
Alfalfa	<i>Medicago spp.</i>
Alsike Clover	<i>Trifolium hybridum</i>
Brown-eyed Susan	<i>Rudbeckia triloba</i>
Butterfly Milkweed	<i>Asclepias tuberosa</i>
Lanceleaf Coreopsis	<i>Coreopsis lanceolata</i>
Partridge Pea	<i>Chamaecrista fasciculata</i>
Timothy	<i>Phleum pratense</i>
Orchardgrass	<i>Dactylis glomerata</i>
Crimson Clover	<i>Trifolium incarnatum</i>
Ladino or White Clover	<i>Trifolium repens</i>

The project is within the vicinity of records for the northern long-eared bat (*Myotis septentrionalis*), a state endangered and federally threatened species, and the little brown bat (*Myotis lucifugus*), a state endangered species. Because presence of state endangered bat species has been established in the area, summer tree cutting is not recommended, and additional summer surveys would not constitute presence/absence in the area. However, limited summer tree cutting inside this buffer may be acceptable after further consultation with DOW (contact Sarah Stankavich, [sarah.stankavich@dnr.state.oh.us](mailto:sarah.stankavich@dnr.state.oh.us)).

In addition, the entire state of Ohio is within the range of the Indiana bat (*Myotis sodalis*), a state endangered and federally endangered species, the northern long-eared bat (*Myotis septentrionalis*), a state endangered and federally threatened species, the little brown bat (*Myotis lucifugus*), a state endangered species, and the tricolored bat (*Perimyotis subflavus*), a state endangered species. During the spring and summer (April 1 through September 30), these bat species predominately roost in trees behind loose, exfoliating bark, in crevices and cavities, or in the leaves. However, these species are also dependent on the forest structure surrounding roost trees. The DOW recommends tree cutting only occur from October 1 through March 31, conserving trees with loose, shaggy bark and/or crevices, holes, or cavities, as well as trees with DBH  $\geq 20$  if possible. If trees are present within the project area, and trees must be cut during the summer months, the DOW recommends a mist net survey or acoustic survey be conducted from

June 1 through August 15, prior to any cutting. Mist net and acoustic surveys should be conducted in accordance with the most recent version of the “OHIO DIVISION OF WILDLIFE GUIDANCE FOR BAT SURVEYS AND TREE CLEARING”.

<https://ohiodnr.gov/static/documents/wildlife/wildlife-management/Bat+Survey+Guidelines.pdf>

The DOW also recommends that a desktop habitat assessment, followed by a field assessment if needed, is conducted to determine if there are potential hibernaculum(a) present within the project area. Information about how to conduct habitat assessments can be found in the current USFWS “Range-wide Indiana Bat Survey Guidelines.” If a habitat assessment finds that potential hibernacula are present within 0.25 miles of the project area, please send this information to Sarah Stankavich, [sarah.stankavich@dnr.state.oh.us](mailto:sarah.stankavich@dnr.state.oh.us) for project recommendations. If a potential or known hibernaculum is found, the DOW recommends a 0.25-mile tree cutting and subsurface disturbance buffer around the hibernaculum entrance, however, limited summer or winter tree cutting may be acceptable after consultation with DOW. If no tree cutting or subsurface impacts to a hibernaculum are proposed, this project is not likely to impact these species.

The DOW recommends no in-water work in perennial streams from April 15 through June 30 to reduce impacts to indigenous aquatic species and their habitat. If no in-water work is proposed in a perennial stream, this project is not likely to impact aquatic species.

The project is within the range of the upland sandpiper (*Bartramia longicauda*), a state endangered bird. Nesting upland sandpipers utilize dry grasslands including native grasslands, seeded grasslands, grazed and ungrazed pasture, hayfields, and grasslands established through the Conservation Reserve Program (CRP). If this type of habitat will be impacted, construction should be avoided in this habitat during the species’ nesting period of April 15 to July 31. If this type of habitat will not be impacted, this project is not likely to impact this species.

The project is within the range of the northern harrier (*Circus hudsonis*), a state endangered bird. This is a common migrant and winter species. Nesters are much rarer, although they occasionally breed in large marshes and grasslands. Harriers often nest in loose colonies. The female builds a nest out of sticks on the ground, often on top of a mound. Harriers hunt over grasslands. If this type of habitat will be impacted, construction should be avoided in this habitat during the species’ nesting period of May 15 to August 1. If this habitat will not be impacted, this project is not likely to impact this species.

Due to the potential of impacts to federally listed species, as well as to state listed species, we recommend that this project be coordinated with the U.S. Fish & Wildlife Service.

**Geological Survey:** The Ohio Geological Survey has the following comment.

### **Physiographic Region**

The proposed project area is in Athens Township, Harrison County. This area is in the Marietta Plateau physiographic region. This region is characterized by a dissected, high-relief plateau landscape. Landslides are common in this area. The remnants of the ancient lacustrine clay filled Teays drainage system is also prevalent in this region. Pennsylvanian-age Conemaugh Group units through the Permian-age Dunkard Group can be found in this region. These units consist of sequences of shales, siltstones, sandstones, limestones and coals (Ohio Department of Natural Resources, Division of Geological Survey, 1998).

### **Surficial Geology**

The project area lies outside the glaciated margin of the state. Surficial geology in the area is derived from bedrock, colluvium and mine spoils. Due to past surface mining activity, much of

the project area is listed as “Not Rated” on ODNR’s most current surficial geology map (Ohio Department of Natural Resources, Division of Geological Survey, *Statewide Surficial Geology Map*).

**Bedrock Geology**

The uppermost bedrock unit in the project area is the Dunkard Group. This unit is Pennsylvanian to Permian-age and consists of thin bedded to massive units of sandstone, siltstone, shale and minor limestone and coal. Rapid horizontal and vertical changes in rock type are common. This unit may be present on hilltops within the eastern portion of the project area. Underlying the Dunkard Group is the Pennsylvanian-age Monongahela Group. This unit is characterized by multiple sequences of shale, siltstone, limestone, sandstone and coal. Units tend to have massive bedding. Many economic coal beds can be found in this this formation. This unit makes up most of the project area. Underlying the Monongahela Group is the Pennsylvanian-age Conemaugh Group. This unit is characterized by multicolored mudstones, occasional coal beds, thin to thick marine shale and limestone. The entire group consists of rapid horizontal and vertical changes in the rock type. This unit may be exposed in areas of lower elevation along the western bounds the project area. Bedrock may be exposed in outcrops and roadcuts within the project area (Slucher et al, 2006).

**Oil, Gas and Mining**

ODNR has record of 56 oil and gas wells within one mile of the proposed project area. Most of these wells are listed as "producing" or "plugged and abandoned" (Ohio Department of Natural Resources, Division of Oil and Gas, *Ohio Oil and Gas Wells Locator*).

ODNR has record of mining operations within the boundaries of the project area. Mining activity within the bounds of the project area includes past surficial coal mining operations. There are many abandoned underground coal mines (AUMs) located just east of the project area, but ODNR does not have record of any AUMs directly beneath the project area (Ohio Department of Natural Resources, Division of Mineral Resources, *Mines of Ohio*).

**Seismic Activity**

Several small earthquakes have historically been recorded near the site. The three events closest to the site are listed in the chart below (Ohio Department of Natural Resources, Division of Geological Survey, *Ohio Earthquake Epicenters*):

Date	Magnitude	Distance to Site Boundary	County	Township
11/27/2016	2.5	4.1 miles	Harrison	Moorefield
11/13/2016	2.5	4.6 miles	Harrison	Moorefield
11/13/2016	2.2	4.7 miles	Harrison	Moorefield

**Geologic Hazards**

Geologic hazards such as mine subsidence and landslides have been known to occur in Harrison County. Mine subsidence typically occurs when there is a collapsed feature in an abandoned underground mine. ODNR does not have record of any abandoned underground mines beneath the project area (Crowell, 2010; Crowell et al, 2013; and Ohio Department of Natural Resources, Division of Mineral Resources, *Mines of Ohio*). Landslide can occur where one or more of the following conditions exist: steep slopes, jointed rocks, fine-grained and permeable rock or sediment, presence of clay or shale units and large amounts of water (Hansen, 1995 and USGS Landslide Inventory).

**Karst**

Karst features usually form in areas that are covered by thin or no glacial drift and the bedrock is limestone or dolomite. There are no karst features present in or near the project area (Ohio Department of Natural Resources, Division of Geological Survey, *Ohio Karst*).

### **Soils**

According to the USDA Web Soil Survey, the project area consists primarily of soils derived from coal extraction mine spoils. Morristown is the most common soil series found within the boundaries of the project area. This soil makes up nearly 90% of the project area. There is a moderate risk of shrink-swell potential in these soils. Slope varies, with slopes containing up to a 70% grade present (USDA Web Soil Survey).

### **Groundwater**

Groundwater resources are limited throughout the project area. Wells developed in bedrock are likely to yield up to five gallons per minute. According to the Groundwater Resources of Harrison County map, the average well yield is two gallons per minute and additional water storage is needed for most users. Instances of saltwater being present at shallow depths is also noted in this publication (Crowell, 1980 and Ohio Department of Natural Resources, Division of Water, *Bedrock Aquifer Map*, 2000). There are no unconsolidated aquifers present (Ohio Department of Natural Resources, Division of Water, *Statewide Unconsolidated Aquifer Map*, 2000).

ODNR has record of eight water wells drilled within one mile of the project area. These wells range in depth from 35 to 250 feet deep, with an average depth of 137 feet. The most common aquifer listed is shale. One well lists limestone as the aquifer and one well does not list an aquifer. A sustainable yield of 1 to 15 gallons per minute is expected from wells drilled in this area based on well log records. The average sustainable yield from these records within one mile was 5.7 gallons per minute. This is based on records from six wells within one mile of the project area that contain sustainable yield data (Ohio Department of Natural Resources, Division of Water, *Ohio Water Wells*).

**Water Resources:** The Division of Water Resources has the following comment.

The local floodplain administrator should be contacted concerning the possible need for any floodplain permits or approvals for this project. Your local floodplain administrator contact information can be found at the website below.

[http://water.ohiodnr.gov/portals/soilwater/pdf/floodplain/Floodplain%20Manager%20Community%20Contact%20List\\_8\\_16.pdf](http://water.ohiodnr.gov/portals/soilwater/pdf/floodplain/Floodplain%20Manager%20Community%20Contact%20List_8_16.pdf)

ODNR appreciates the opportunity to provide these comments. Please contact Sarah Tebbe, Environmental Specialist, at (614) 265-6397 or [Sarah.Tebbe@dnr.state.oh.us](mailto:Sarah.Tebbe@dnr.state.oh.us) if you have questions about these comments or need additional information.

Mike Pettegrew  
Environmental Services Administrator (Acting)



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# Ohio Solar Site Pollinator Habitat Planning and Assessment Form

1. Percent of total site planted with native or beneficial introduced flowering plants.

25-50%	10 points
51-75%	20 points
76-100%	30 points

2. Flowering plant diversity in site perimeter & buffer area (species with more than 1% cover).

9-12 species	5 points
13-16 species	10 points
17-20 species	15 points
20+ species	20 points
Site specific Milkweed included @2,000 pls/ac minimum	10 points

\* *If no boxes were selected in questions 1 or 2 then your site does not meet criteria to be considered as an OPHI Solar Pollinator Habitat. However, OPHI can work with you on ways to increase the pollinator score of your site.*

3. Flowering plant seed mixes and plantings to be used.

*Native species local to the site are preferred; otherwise species native to Ohio are encouraged.*

Includes only native plant species	15 points
Includes native and beneficial introduced plant species	10 points
Includes only beneficial introduced plant species	5 points

4. Flowering plant diversity in rows & under solar array.

4-6	5 points
7+	10 points
Site specific Milkweed included @2,000 pls/ac minimum	10 points

5. Seasons with at least 3 blooming species. Check all that apply.

Spring (April – May)	5 points
Summer (June – August)	5 points
Fall (September – October)	5 points

6. Available habitat components within ¼ mile of site.

Check all that apply.

Native grasses	2 points
Trees and shrubs	2 points
Forest edge habitat	2 points
Cavity nesting sites	2 points
Clean perennial water sources	2 points

7. Planned vegetative buffers adjacent to the solar site. Check all that apply.

Site has planned buffer adjacent to solar site	5 points
Buffer is at least 30 feet wide as measured from array fencing or edge of flower plantings	5 points
Buffer is at least 50 feet wide as measured from array fencing or edge of flower plantings	10 points
Buffer includes flowering Shrubs/trees and other shrubs/trees that provide food for wildlife	5 points

8. Habitat site preparation prior to implementation.

Measures taken to control weeds and invasive species prior to seeding/planting.	10 points
Appropriate soil preparation done to reduce erosion	
And enhance germination/growth	5 points
None	-10 points

9. Planned management practices for areas designated as part of the pollinator habitat site. Check all that apply.

Detailed establishment and management plan developed for site	10 points
Mowing Follows OPHI mowing schedule for monarchs each year	5 points
Mowing is staggered over a 2 week period	5 points
Signage indicating site is wildlife & pollinator-friendly	5 points
Creation of habitat features (e.g. boxes, pass-through tunnels, bee hotels)	5 points
Long-term monitoring plan developed that includes re-certification as Solar Site Pollinator Habitat	10 points

10. Insecticide risk. Check if applicable.

*Communication with adjacent landowners about the project and possible impacts of their insecticide use is critical*

Site is adjacent to land (within 120 ft.) where insecticides are used	-20 points
Planned on-site insecticide use (including pre-treated seeds/plants)	-40 points

**Total Points:** \_\_\_\_\_

**Provides High Quality Pollinator Habitat** > 85  
**Meets OPHI Solar Pollinator Habitat Standards** 70-84

**Site Owner/Operator:**

**Project Location:**

**Project Size (acres):**

**Planned Source of Seeds:**

**Planned Seeding Date:**

**Habitat & Vegetation Consultant:**

Refer to [www.ophi.info](http://www.ophi.info) for more information regarding solar pollinator habitat development.

Version 1 - March 2018  
 Developed by the OPHI Solar Pollinator Program Advisory Team

