4.0 ENVIRONMENTAL CONSEQUENCES

This section of the EA describes the potential impacts of the Project on land use; soils; wetlands; water quality; floodplains; vegetation; wildlife; threatened, endangered, or rare species; air quality; cultural resources; transportation; health and safety; socioeconomics; and visual resources. Both short-term impacts associated with the proposed construction activity, and long-term impacts associated with operation of the proposed Project, have been considered. These activities include the construction, operations, and maintenance of the proposed 49.9 MW PV facility and an approximately 1.87-mile 69 kV transmission feeder line within a 100-foot wide corridor from a dead-end structure on the facility site to Columbus Southern Power's existing South Cumberland 138/69kV substation.

This EA addresses individual and cumulative impacts associated with the proposed action and alternatives. The Council on Environmental Quality regulations for the implementation of NEPA define cumulative impacts as, "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such action." Potential cumulative impacts are identified at the end of each resource section.

The region of influence for the majority of the resources investigated was limited to the immediate vicinity of the Project Area. However, the region of influence, or area of potential effect (APE), for aboveground cultural resources for the proposed Project was divided into a direct APE, or the land directly impacted by ground disturbance, and an indirect APE, which includes cultural resources that may be visually impacted by the construction of the Project within one mile of the direct APE. The region of influence for wetlands and streams in the Project area was downstream and in the immediate vicinity of the Project Area, and the region of influence for socioeconomics was the county that the Project would directly affect.

4.1 LAND USE

4.1.1 No Action

The No Action alternative would have no short- or long-term impacts to land use because no construction would occur.

4.1.2 Construction and Operation Impacts

The entire TPS facility site consists of 771 acres. Of this, approximately 400 acres would be disturbed for facility construction, and approximately 11.3 acres would be dedicated to the 100-foot wide 69 kV transmission feeder line corridor. The TPS transmission interconnection would require the construction of an approximately 1.87 mile 69 kV transmission feeder line within a 100-foot wide corridor from a dead-end structure in the switchyard to Ohio Power Company's existing South Cumberland 138/69kV substation south of the facility (see **Figures 2-15a and 2-15b**). The 100-foot right of way is necessary to allow for safe operation of equipment used to construct the transmission line. The proposed transmission line would be supported by 60-foot tall wood monopole structures that would be spaced approximately 250-300 feet apart. Approximately 0.58 miles of this proposed corridor would be placed through a non-forested area immediately adjacent and parallel to Chapel Drive (County Route 20). In addition,

approximately 1.29 miles of the proposed corridor would be located immediately adjacent and parallel to an existing 100-foot wide 69 kV electric transmission line right-of-way (ROW) that would not involve the rebuilding or replacement of the existing electric transmission line.

The entire TPS facility site consists of former strip mines and associated mine spoil areas that have been reclaimed since the 1990s and planted to grasses. Since reclamation, the site has been used sporadically for recreation (e.g., hunting) and grazing of livestock. These uses would be precluded by the construction and operation of the TPS facility on the approximately 400 acres that will be fenced and gated to enclose the solar arrays. The removal of this acreage from hunting and/or grazing is considered a minor impact, since the landowner, Ohio AEP, maintains approximately 60,000 acres of reclaimed strip mine land in the Project vicinity for these purposes (AEP 2011c).

A few oil production facilities are scattered across the site. These oil production facilities are to remain undisturbed and would co-exist with the TPS facility.

The proposed 69 kV transmission line corridor would have a minor impact on the existing land use in the Project Area. The new transmission line would be parallel and immediately adjacent to an existing 69 kV transmission line corridor. The existing land use along this section of the existing/proposed transmission line corridors would remain unchanged.

4.1.3 Cumulative Impacts

As described above, the Project would have minimal impacts on the existing land use within the Project Area. Therefore, no cumulative impacts on land use are expected by the Project.

4.2 GEOLOGY AND SOILS

4.2.1 No Action

The No Action alternative would have no short- or long-term impacts to soils because no construction would occur.

4.2.2 Construction and Operation Impacts

Construction and operational activities associated with the Project could adversely affect site soils. Potential impacts include soil erosion, loss of soil productivity, and the establishment of noxious weeds on the soil surface. Construction activities such as vegetation clearing, trenching, grading, topsoil segregation, and back filling may also increase erosion potential by destabilizing the soil surface. Soil compaction can result from the movement of heavy construction vehicles over the Project site and along the transmission line corridor. The degree of compaction would depend on the moisture content and texture of the soil. These impacts would be short-term in nature and minimized as much as practicable. Furthermore, the soils at the Project site and within the existing transmission line ROW have been previously disturbed by strip mining and the construction of the existing transmission line, so little or no additional impacts are anticipated in these areas.

During construction of the Project, soils at the construction site would be exposed to erosion. Soil erosion practices would be implemented during the construction phase of the Project that

would guard against soils leaving the construction site, and disturbed areas would be stabilized and re-vegetated, as soon as practicable, once construction activities are completed. As a result, no significant erosion problems are anticipated by the construction of the Project.

As presented in **Section 3.2**, no prime, unique, or otherwise important farmland soils exist in the Project Area. Therefore, no adverse impact to prime, unique or important farmland soils is expected from the Project.

4.2.3 Cumulative Impacts

Because the Project Area is in an area that has been previously strip-mined and contains no prime, unique, or otherwise important farmland soils, no cumulative farmland impacts are expected from the Project. The transmission feeder line would temporarily impact potential farmland during construction, but it would take no potential farmland out of permanent production.

4.3 WATER RESOURCES

4.3.1 Wetlands, Streams and Ponds

4.3.1.1 No Action

The No Action alternative would have no short- or long-term impacts to wetlands, streams or ponds since no new construction would occur.

4.3.1.2 Construction and Operation Impacts

The Project has been planned to avoid and minimize impacts to wetlands, streams, and ponds. Its location at the top of a watershed in an upland area that was formerly strip-mined and then reclaimed was part of a siting effort to avoid impacting natural wetlands, streams, and other valuable habitats. However, the Project would require the grading and clearing of 400 acres for temporary construction purposes. Several small wetlands and streams that developed post-reclamation would be impacted by this process (**Tables 4-1 to 4-2; Figure 4-1a to 4-1j**). A few large ponds also occur in the Project vicinity, and none of these would be impacted. However, three very small ponds within the 400 acres would be impacted (i.e., converted and filled) by the solar facility's construction (**Table 4-3**).

Table 4-1 Summary of Jurisdictional and Non-Jurisdictional Wetlands Impacted by the Solar Facility Construction

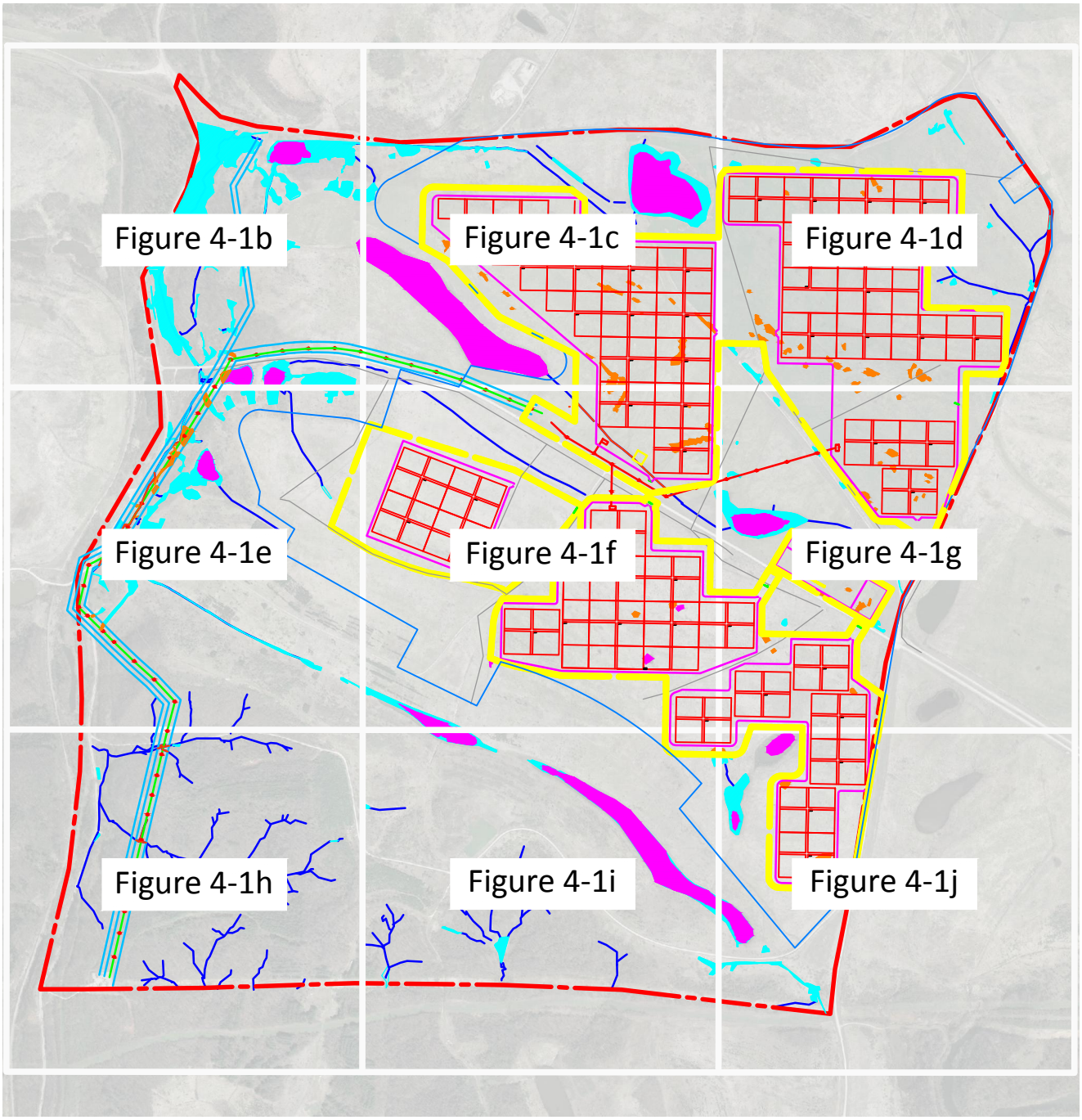
Wet. #	Fig. #	Wetland ID	Prelim. ORAM score	Provisional Wetland Category	Preliminary Jurisdictional Status	Covertype	Total Size (acres)	Impacted Wetland (acres)
1	4-1d	Wetland AO	18	One	Jurisdictional	Emergent	0.01	0.01
Totals, Jurisdictional Wetlands							**0.01**	**0.01**
2	4-1j	Wetland B	18	One	Isolated	Emergent	0.44	0.17
3	4-1j	Wetland C	15	One	Isolated	Emergent	0.04	0.01
4	4-1j	Wetland D	13	One	Isolated	Emergent	0.22	0.22
5	4-1j	Wetland E	13	One	Isolated	Emergent	0.11	0.11

Table 4-1 Summary of Jurisdictional and Non-Jurisdictional Wetlands Impacted by the Solar Facility Construction

Wet. #	Fig. #	Wetland ID	Prelim. ORAM score	Provisional Wetland Category	Preliminary Jurisdictional Status	Covertype	Total Size (acres)	Impacted Wetland (acres)
6	4-1g	Wetland F	12	One	Isolated	Emergent	0.04	0.04
7	4-1g	Wetland H	15	One	Isolated	Emergent	0.06	0.06
8	4-1g	Wetland I	12	One	Isolated	Emergent	0.02	0.02
9	4-1f	Wetland J	12	One	Isolated	Emergent	0.05	0.05
10	4-1f	Wetland K	12	One	Isolated	Emergent	0.06	0.06
11	4-1d	Wetland R	16	One	Isolated	Emergent	0.17	0.17
12	4-1d	Wetland S	14	One	Isolated	Emergent	0.06	0.06
13	4-1d	Wetland T	16	One	Isolated	Emergent	0.12	0.12
14	4-1d	Wetland U	14	One	Isolated	Emergent	0.05	0.05
15	4-1g	Wetland V	14	One	Isolated	Emergent	0.03	0.03
16	4-1d	Wetland W	14	One	Isolated	Emergent	0.03	0.03
17	4-1d	Wetland X	14	One	Isolated	Emergent	0.06	0.06
18	4-1d	Wetland Y	14	One	Isolated	Emergent	0.03	0.03
19	4-1d	Wetland Z	14	One	Isolated	Emergent	0.03	0.03
20	4-1g	Wetland AA	12	One	Isolated	Emergent	0.02	0.02
21	4-1d	Wetland AB	12	One	Isolated	Emergent	0.02	0.02
22	4-1d	Wetland AC	12	One	Isolated	Emergent	0.04	0.04
23	4-1d	Wetland AD	12	One	Isolated	Emergent	0.03	0.03
24	4-1d	Wetland AE	12	One	Isolated	Emergent	0.02	0.02
25	4-1d	Wetland AF	13	One	Isolated	Emergent	0.13	0.13
26	4-1d	Wetland AG	12	One	Isolated	Emergent	0.06	0.06
27	4-1d	Wetland AH	12	One	Isolated	Emergent	0.02	0.02
28	4-1d	Wetland AI	12	One	Isolated	Emergent	0.08	0.08
29	4-1d	Wetland AJ	12	One	Isolated	Emergent	0.01	0.01
30	4-1d	Wetland AQ	14	One	Isolated	Emergent	0.02	0.02
31	4-1d	Wetland AS	14	One	Isolated	Emergent	0.02	0.02
32	4-1d	Wetland AT	14	One	Isolated	Emergent	0.01	0.01
33	4-1d	Wetland AU	14	One	Isolated	Emergent	0.01	0.01
34	4-1g	Wetland AX	12	One	Isolated	Emergent	0.01	0.01
35	4-1g	Wetland AY	12	One	Isolated	Emergent	0.01	0.01
36	4-1g	Wetland AZ	12	One	Isolated	Emergent	0.01	0.01
37	4-1g	Wetland BA	12	One	Isolated	Emergent	0.03	0.03
38	4-1g	Wetland BB	12	One	Isolated	Emergent	0.10	0.10
39	4-1g	Wetland BC	12	One	Isolated	Emergent	0.01	0.01
40	4-1g	Wetland BD	12	One	Isolated	Emergent	0.04	0.04
41	4-1g	Wetland BE	15	One	Isolated	Emergent	0.08	0.08
42	4-1g	Wetland BF	12	One	Isolated	Emergent	0.01	0.01
43	4-1g	Wetland BG	12	One	Isolated	Emergent	0.01	0.01
44	4-1g	Wetland BH	12	One	Isolated	Emergent	0.01	0.01
45	4-1g	Wetland BI	13	One	Isolated	Emergent	0.11	0.05
46	4-1c	Wetland BN	15	One	Isolated	Emergent	0.15	0.15
47	4-1g	Wetland BO	13	One	Isolated	Emergent	0.26	0.17
48	4-1g	Wetland BP	12	One	Isolated	Emergent	0.02	0.02

Table 4-1 Summary of Jurisdictional and Non-Jurisdictional Wetlands Impacted by the Solar Facility Construction

Wet. #	Fig. #	Wetland ID	Prelim. ORAM score	Provisional Wetland Category	Preliminary Jurisdictional Status	Covertype	Total Size (acres)	Impacted Wetland (acres)
49	4-1g	Wetland BQ	12	One	Isolated	Emergent	0.08	0.08
50	4-1g	Wetland BR	12	One	Isolated	Emergent	0.02	0.02
51	4-1g	Wetland BS	12	One	Isolated	Emergent	0.02	0.02
52	4-1g	Wetland BT	12	One	Isolated	Emergent	0.02	0.02
53	4-1g	Wetland BU	12	One	Isolated	Emergent	0.05	0.05
54	4-1g	Wetland BV	12	One	Isolated	Emergent	0.02	0.02
55	4-1d	Wetland BY	12	One	Isolated	Emergent	0.05	0.05
56	4-1d	Wetland BZ	12	One	Isolated	Emergent	0.03	0.03
57	4-1d	Wetland CA	12	One	Isolated	Emergent	0.02	0.02
58	4-1f	Wetland CF	14	One	Isolated	Emergent	0.56	0.49
59	4-1f	Wetland CG	12	One	Isolated	Emergent	0.08	0.08
60	4-1f	Wetland CH	12	One	Isolated	Emergent	0.08	0.08
61	4-1c	Wetland CI	13	One	Isolated	Emergent	0.20	0.20
62	4-1c	Wetland CJ	14	One	Isolated	Emergent	0.35	0.35
63	4-1c	Wetland CK	13	One	Isolated	Emergent	0.13	0.13
64	4-1c	Wetland CL	14	One	Isolated	Emergent	0.03	0.03
65	4-1c	Wetland CM	10	One	Isolated	Emergent	0.003	0.003
66	4-1c	Wetland CM'	16	One	Isolated	Emergent	0.35	0.35
67	4-1f	Wetland CN	14	One	Isolated	Emergent	0.004	0.004
68	4-1c	Wetland CO	12	One	Isolated	Emergent	0.02	0.02
69	4-1c	Wetland CP	14	One	Isolated	Emergent	0.03	0.03
70	4-1c	Wetland CQ	14	One	Isolated	Emergent	0.01	0.01
71	4-1c	Wetland CW	18	One	Isolated	Emergent	0.02	0.02
72	4-1c	Wetland CX	18	One	Isolated	Emergent	0.07	0.07
73	4-1c	Wetland CY	16	One	Isolated	Emergent	0.04	0.04
74	4-1c	Wetland CZ	18	One	Isolated	Emergent	0.02	0.02
75	4-1c	Wetland DA	13	One	Isolated	Emergent	0.01	0.01
Totals, Isolated Wetlands							**5.287**	**4.767**



LEGEND

- Wetland
- Impacted Wetland
- Pond
- Stream
- Impacted Stream
- Wetland DX — Transmission Line Spanning
- Wetland AP — Jurisdictional Status Wetland or Stream
- Outer Perimeter
- Grading Boundary
- Transmission Line Easement
- Transmission Line
- Solar Panel

N

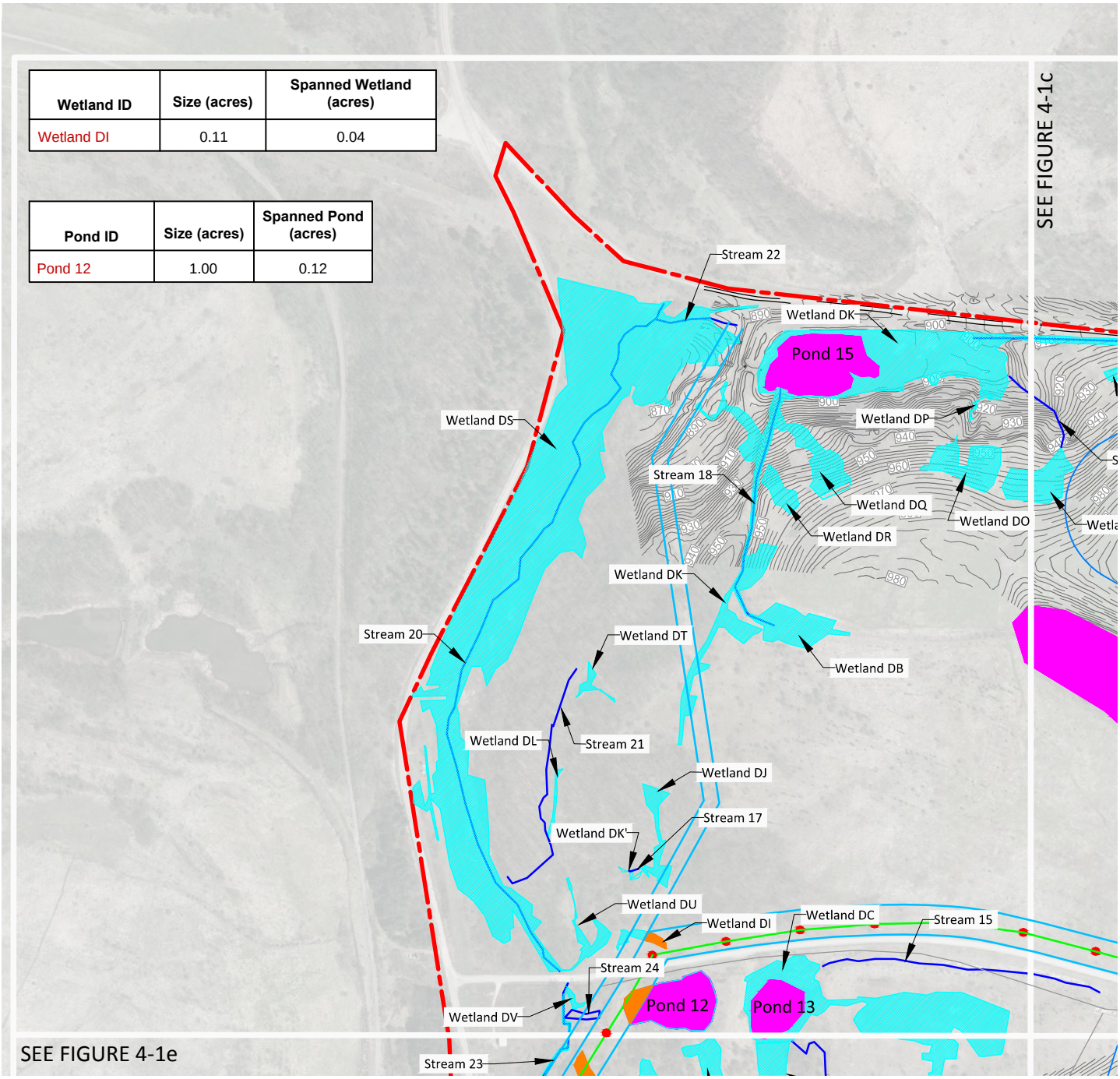
0 375 750 1,500 3,000

Agile Energy, Turning Point Solar Project,
Brookfield Township, Noble County, Ohio

Figure 4-1a. - Wetland and Waters Impact Map Index

Wetland ID	Size (acres)	Spanned Wetland (acres)
Wetland DI	0.11	0.04

Pond ID	Size (acres)	Spanned Pond (acres)
Pond 12	1.00	0.12



LEGEND

- Wetland
- Impacted Wetland
- Pond
- Stream
- Impacted Stream
- Wetland DX — Transmission Line Spanning
- Wetland AP — Jurisdictional Status Wetland or Stream
- Outer Perimeter
- Grading Boundary
- Transmission Line Easement
- Transmission Line
- Solar Panel

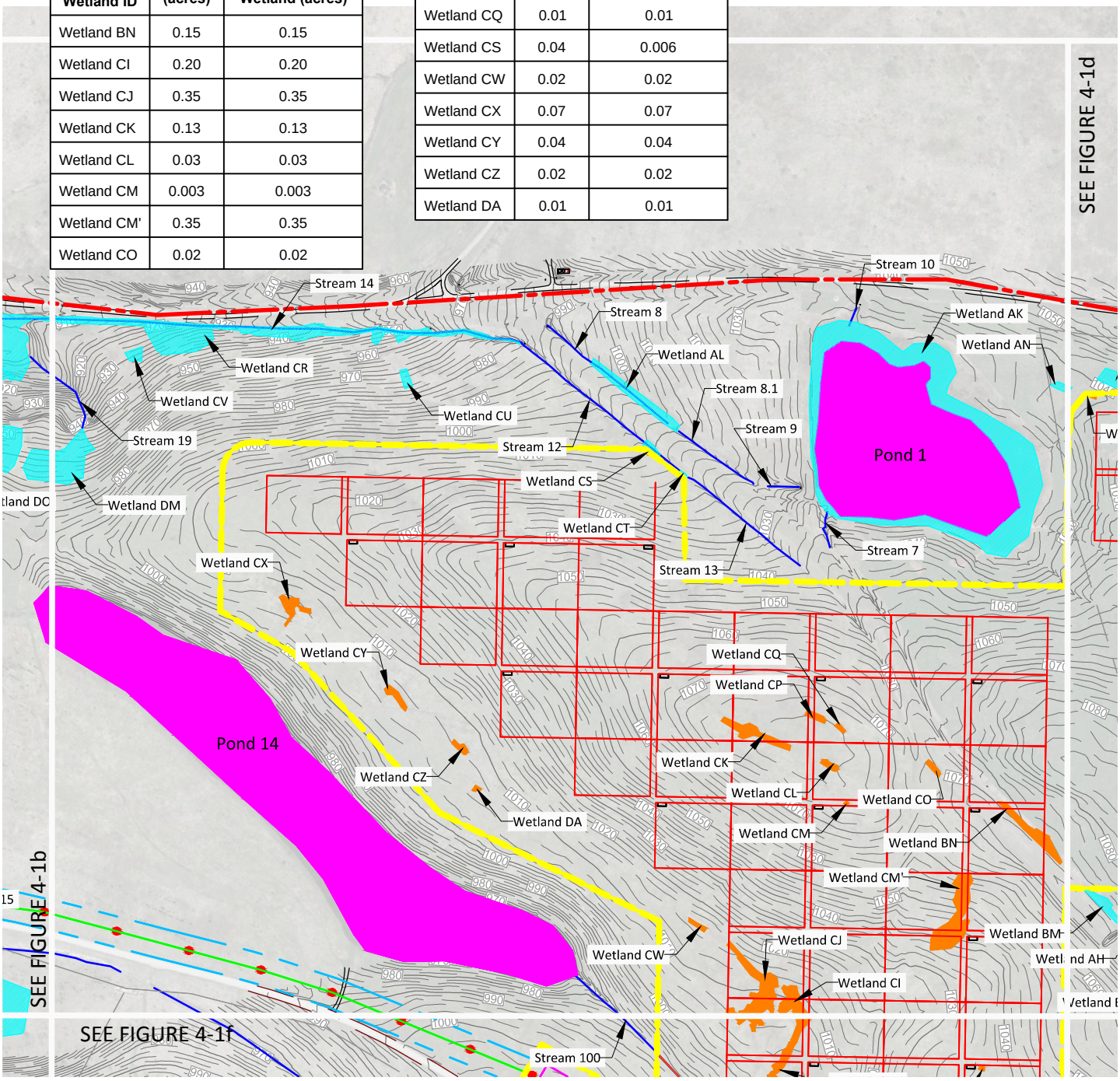
N

0 125 250 500 1,000

Agile Energy, Turning Point Solar Project, Brookfield Township, Noble County, Ohio

Figure 4-1b. Wetlands and Waters Impact Map - northwest

Wetland ID	Size (acres)	Impacted Wetland (acres)
Wetland BN	0.15	0.15
Wetland CI	0.20	0.20
Wetland CJ	0.35	0.35
Wetland CK	0.13	0.13
Wetland CL	0.03	0.03
Wetland CM	0.003	0.003
Wetland CM'	0.35	0.35
Wetland CO	0.02	0.02
Wetland CP	0.03	0.03
Wetland CQ	0.01	0.01
Wetland CS	0.04	0.006
Wetland CW	0.02	0.02
Wetland CX	0.07	0.07
Wetland CY	0.04	0.04
Wetland CZ	0.02	0.02
Wetland DA	0.01	0.01



LEGEND

- Wetland
- Impacted Wetland
- Pond
- Stream
- Impacted Stream
- Transmission Line Spanning
- Jurisdictional Status Wetland or Stream
- Outer Perimeter
- Grading Boundary
- Transmission Line Easement
- Transmission Line
- Solar Panel

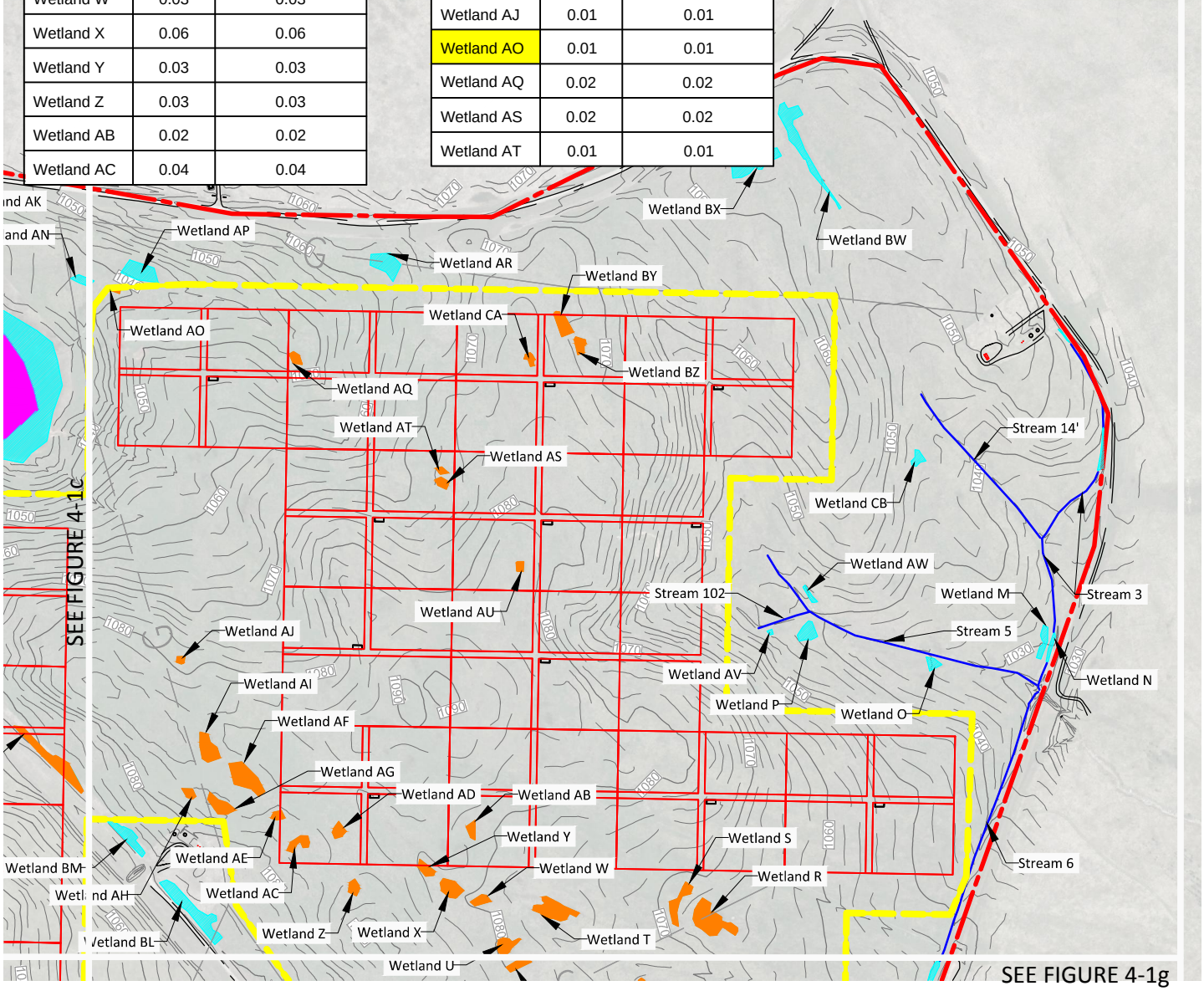
N

0 125 250 500 1,000

Agile Energy, Turning Point Solar Project, Brookfield Township, Noble County, Ohio

Figure 4-1c. Wetlands and Waters Impact Map - north-central

Wetland ID	Size (acres)	Impacted Wetland (acres)
Wetland R	0.17	0.17
Wetland S	0.06	0.06
Wetland T	0.12	0.12
Wetland U	0.05	0.05
Wetland W	0.03	0.03
Wetland X	0.06	0.06
Wetland Y	0.03	0.03
Wetland Z	0.03	0.03
Wetland AB	0.02	0.02
Wetland AC	0.04	0.04
Wetland AD	0.03	0.03
Wetland AE	0.02	0.02
Wetland AF	0.13	0.13
Wetland AG	0.06	0.06
Wetland AH	0.02	0.02
Wetland AI	0.08	0.08
Wetland AJ	0.01	0.01
Wetland AO	0.01	0.01
Wetland AQ	0.02	0.02
Wetland AS	0.02	0.02
Wetland AT	0.01	0.01
Wetland AU	0.01	0.01
Wetland BY	0.05	0.05
Wetland BZ	0.03	0.03
Wetland CA	0.02	0.02



LEGEND

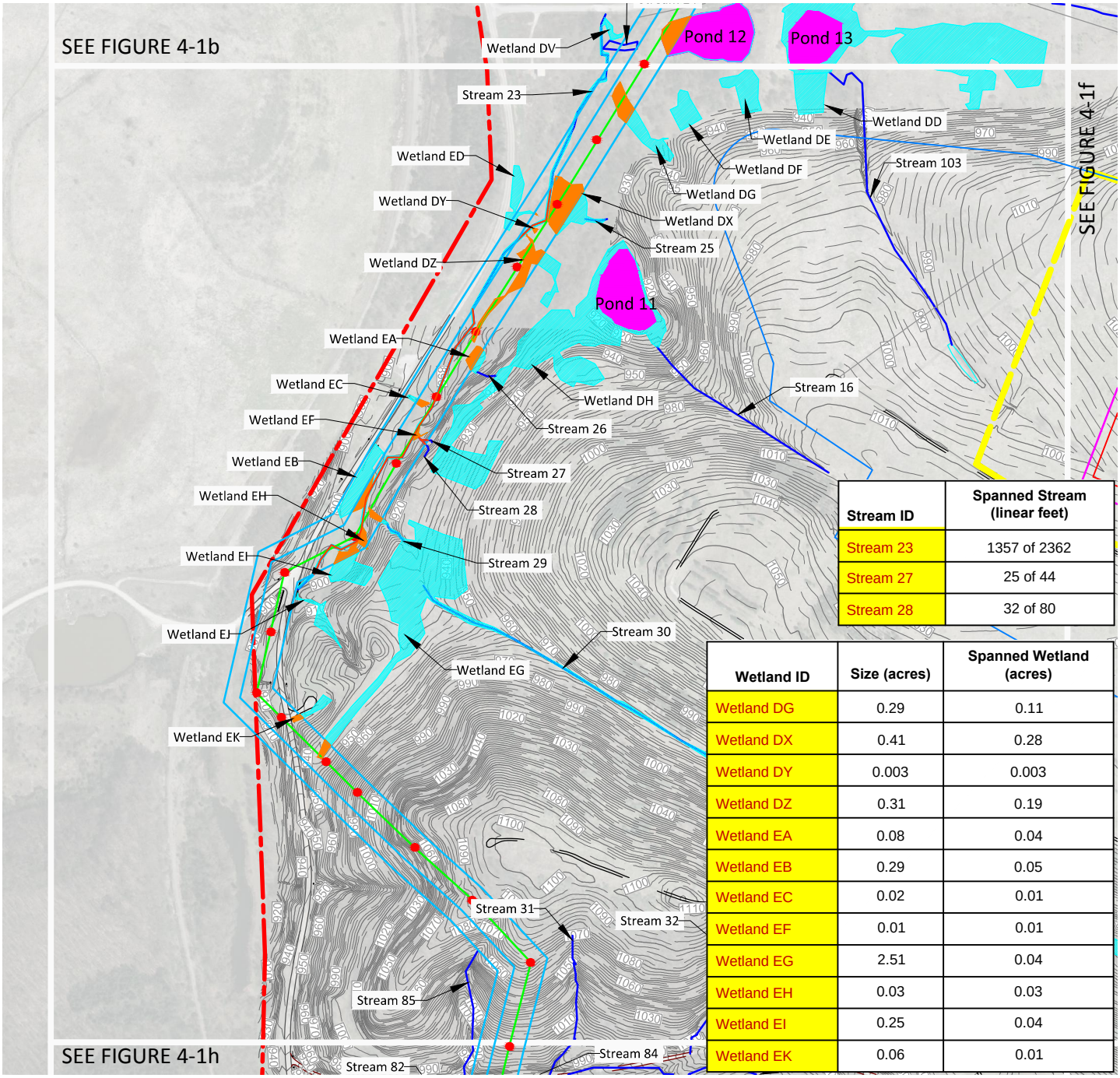
- Wetland
- Impacted Wetland
- Pond
- Stream
- Impacted Stream
- Transmission Line Spanning (Wetland DX)
- Jurisdictional Status Wetland or Stream (Wetland AP)
- Outer Perimeter
- Grading Boundary
- Transmission Line Easement
- Transmission Line
- Solar Panel

N

0 125 250 500 1,000

Agile Energy, Turning Point Solar Project, Brookfield Township, Noble County, Ohio

Figure 4-1d. Wetlands and Waters Impact Map - northeast



Stream ID	Spanned Stream (linear feet)
Stream 23	1357 of 2362
Stream 27	25 of 44
Stream 28	32 of 80

Wetland ID	Size (acres)	Spanned Wetland (acres)
Wetland DG	0.29	0.11
Wetland DX	0.41	0.28
Wetland DY	0.003	0.003
Wetland DZ	0.31	0.19
Wetland EA	0.08	0.04
Wetland EB	0.29	0.05
Wetland EC	0.02	0.01
Wetland EF	0.01	0.01
Wetland EG	2.51	0.04
Wetland EH	0.03	0.03
Wetland EI	0.25	0.04
Wetland EK	0.06	0.01

LEGEND

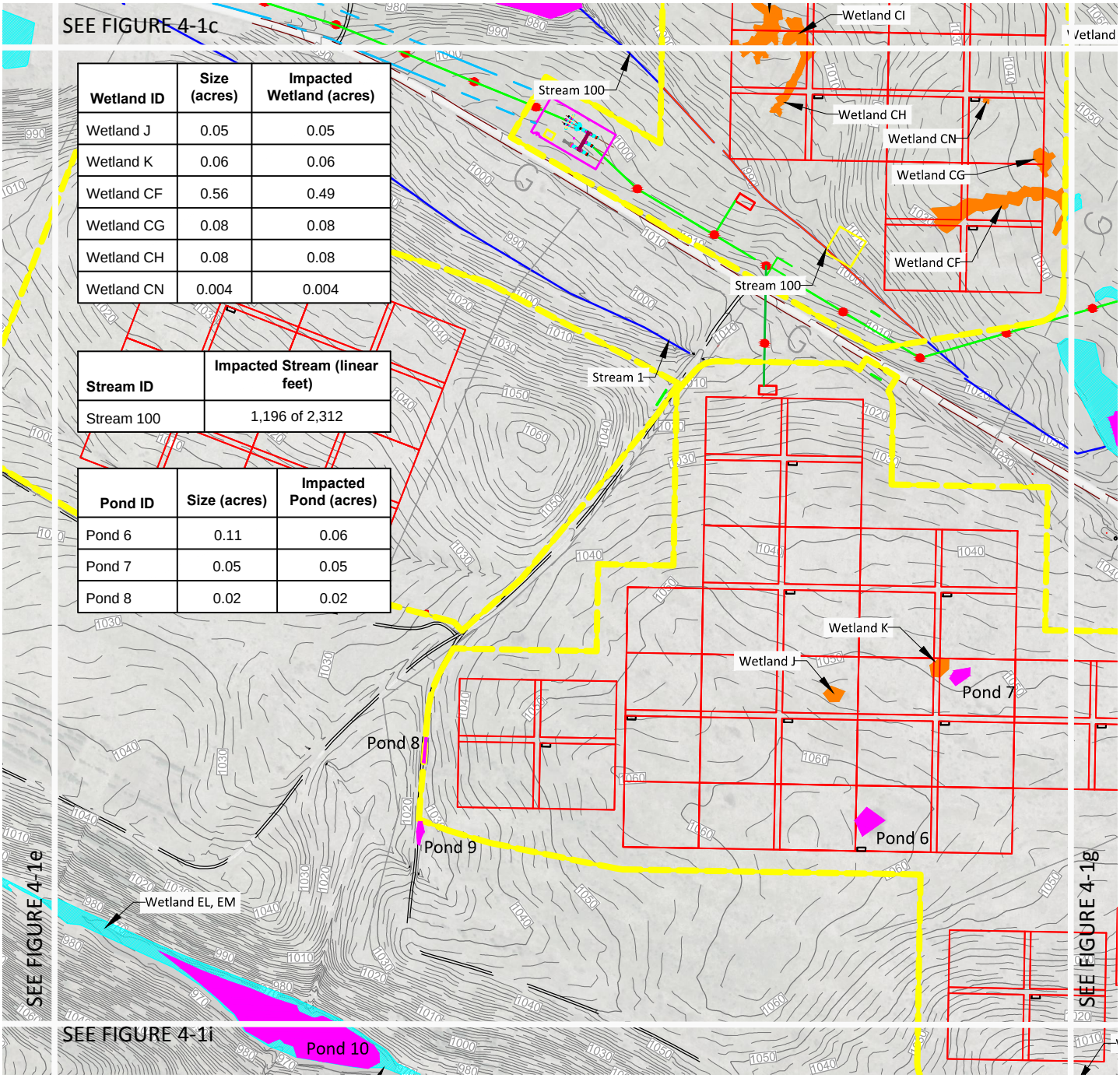
- Wetland
- Impacted Wetland
- Pond
- Stream
- Impacted Stream
- Wetland DX — Transmission Line Spanning
- Wetland AP — Jurisdictional Status Wetland or Stream
- Outer Perimeter
- Grading Boundary
- Transmission Line Easement
- Transmission Line
- Solar Panel

N

0 125 250 500 1,000

Agile Energy, Turning Point Solar Project, Brookfield Township, Noble County, Ohio

Figure 4-1e Wetlands and Waters Impact Map - west-central



Wetland ID	Size (acres)	Impacted Wetland (acres)
Wetland J	0.05	0.05
Wetland K	0.06	0.06
Wetland CF	0.56	0.49
Wetland CG	0.08	0.08
Wetland CH	0.08	0.08
Wetland CN	0.004	0.004

Stream ID	Impacted Stream (linear feet)
Stream 100	1,196 of 2,312

Pond ID	Size (acres)	Impacted Pond (acres)
Pond 6	0.11	0.06
Pond 7	0.05	0.05
Pond 8	0.02	0.02

LEGEND

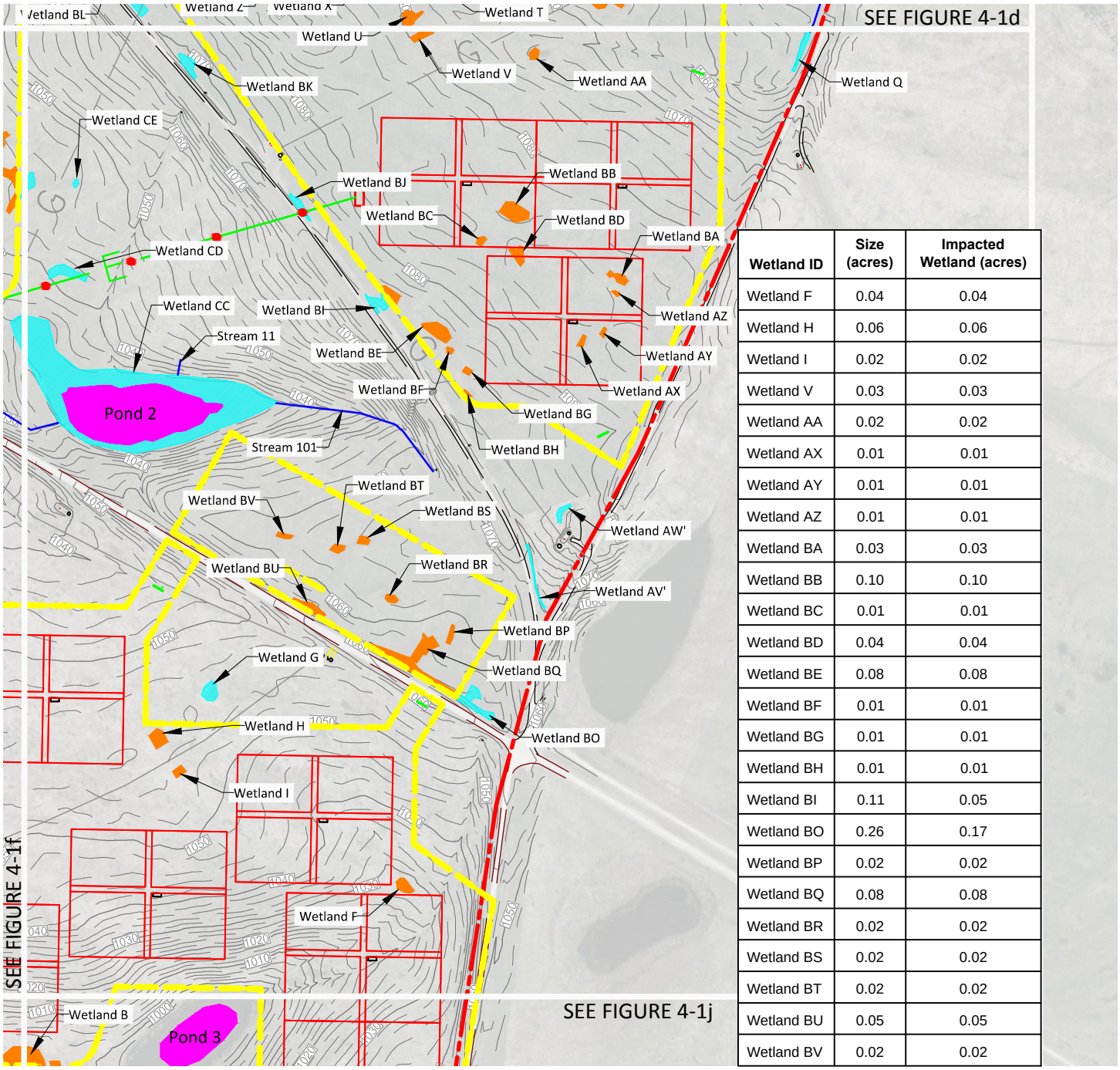
- Wetland
- Impacted Wetland
- Pond
- Stream
- Impacted Stream
- Transmission Line Spanning (Wetland DX)
- Jurisdictional Status Wetland or Stream (Wetland AP)
- Outer Perimeter
- Grading Boundary
- Transmission Line Easement
- Transmission Line
- Solar Panel

N

0 125 250 500 1,000

Agile Energy, Turning Point Solar Project, Brookfield Township, Noble County, Ohio

Figure 4-1f. Wetlands and Waters Impact Map - central



Wetland ID	Size (acres)	Impacted Wetland (acres)
Wetland F	0.04	0.04
Wetland H	0.06	0.06
Wetland I	0.02	0.02
Wetland V	0.03	0.03
Wetland AA	0.02	0.02
Wetland AX	0.01	0.01
Wetland AY	0.01	0.01
Wetland AZ	0.01	0.01
Wetland BA	0.03	0.03
Wetland BB	0.10	0.10
Wetland BC	0.01	0.01
Wetland BD	0.04	0.04
Wetland BE	0.08	0.08
Wetland BF	0.01	0.01
Wetland BG	0.01	0.01
Wetland BH	0.01	0.01
Wetland BI	0.11	0.05
Wetland BO	0.26	0.17
Wetland BP	0.02	0.02
Wetland BQ	0.08	0.08
Wetland BR	0.02	0.02
Wetland BS	0.02	0.02
Wetland BT	0.02	0.02
Wetland BU	0.05	0.05
Wetland BV	0.02	0.02

LEGEND

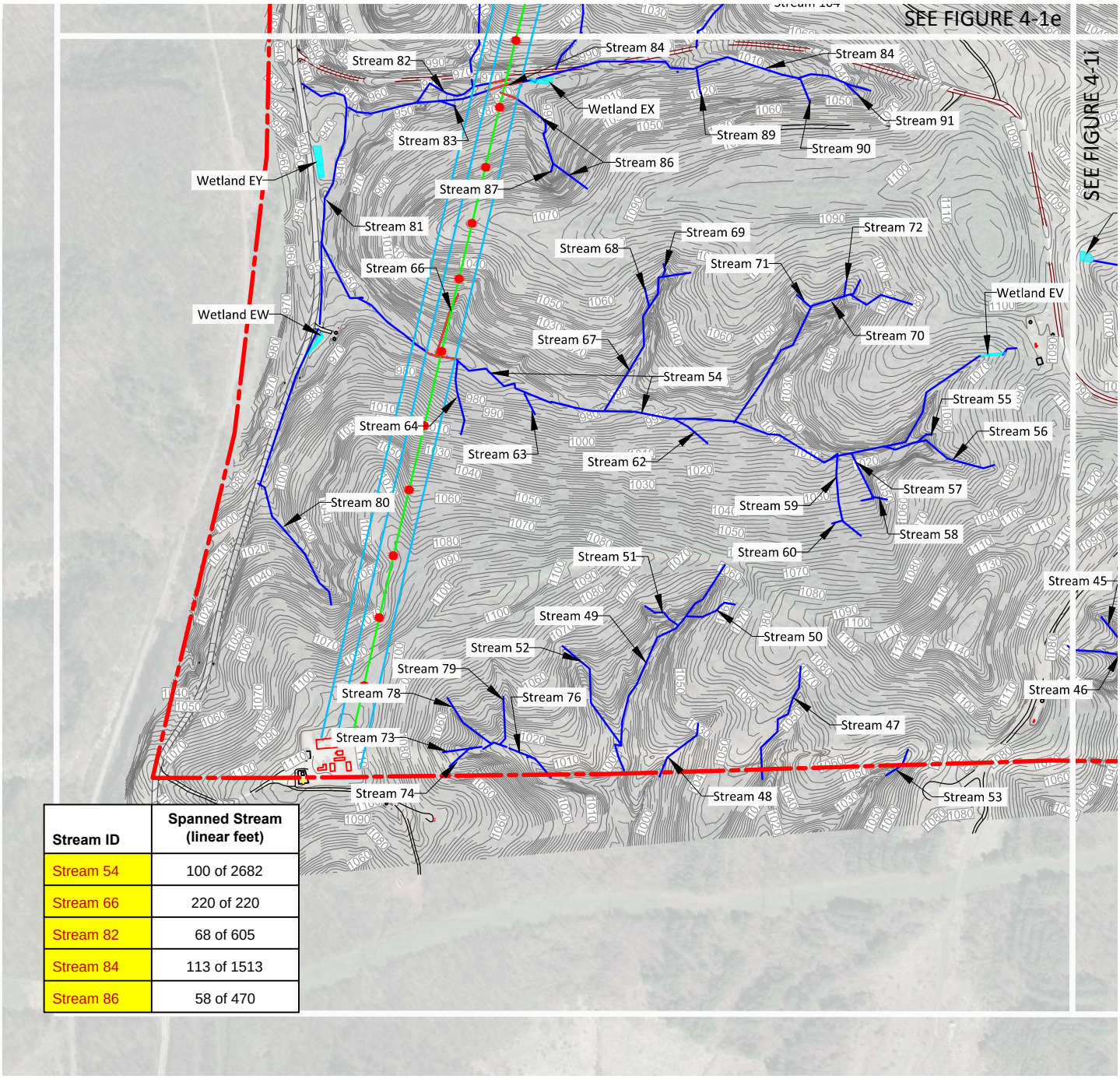
- Wetland
- Impacted Wetland
- Pond
- Stream
- Impacted Stream
- Wetland DX — Transmission Line Spanning
- Wetland AP — Jurisdictional Status Wetland or Stream
- Outer Perimeter
- Grading Boundary
- Transmission Line Easement
- Transmission Line
- Solar Panel

N

0 125 250 500 1,000

Agile Energy, Turning Point Solar Project, Brookfield Township, Noble County, Ohio

Figure 4-1g. Wetlands and Waters Impact Map - east-central



Stream ID	Spanned Stream (linear feet)
Stream 54	100 of 2682
Stream 66	220 of 220
Stream 82	68 of 605
Stream 84	113 of 1513
Stream 86	58 of 470

LEGEND

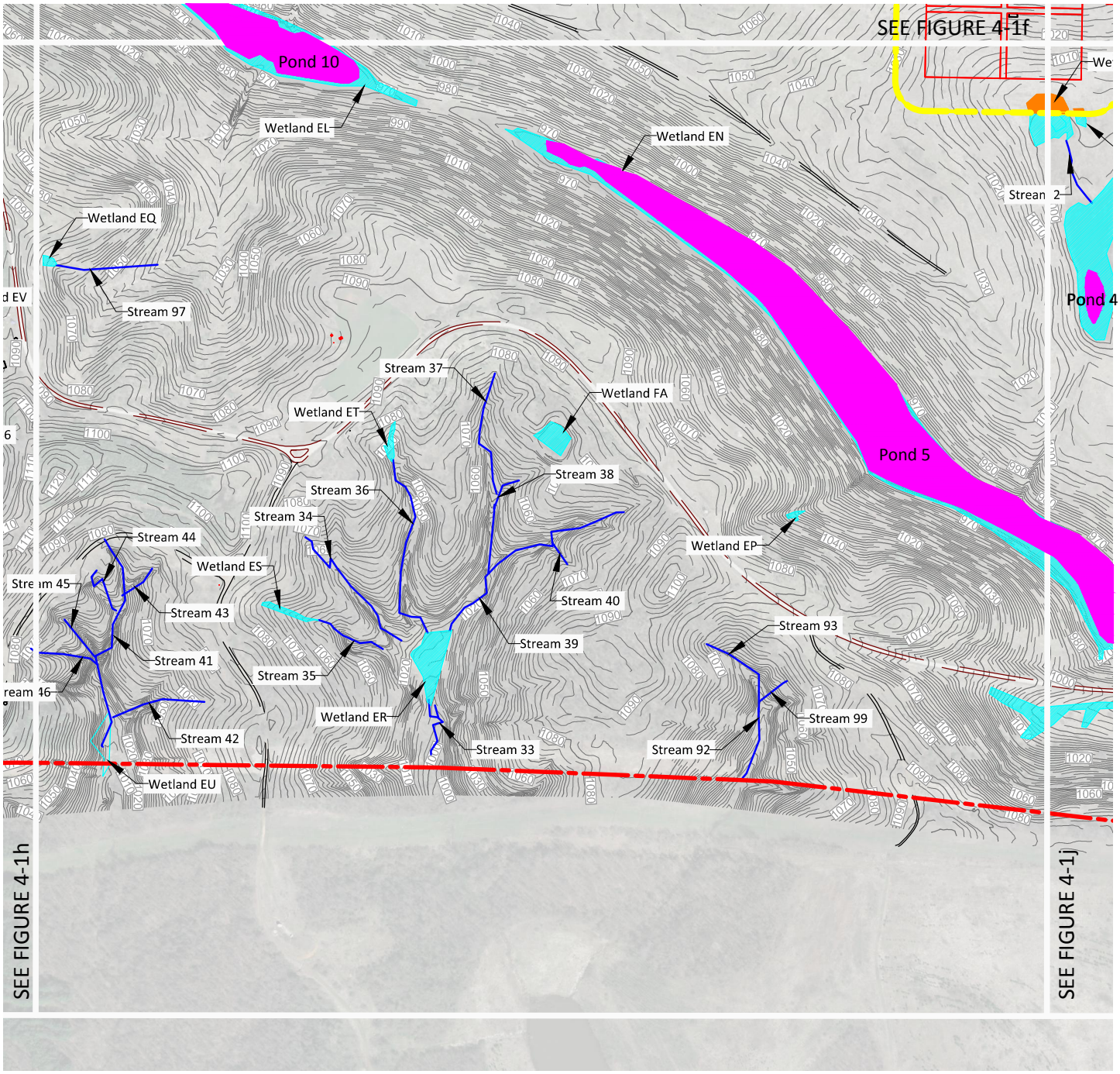
- Wetland
- Impacted Wetland
- Pond
- Stream
- Impacted Stream
- Wetland DX — Transmission Line Spanning
- Wetland AP — Jurisdictional Status Wetland or Stream
- Outer Perimeter
- Grading Boundary
- Transmission Line Easement
- Transmission Line
- Solar Panel

N

0 125 250 500 1,000

Agile Energy, Turning Point Solar Project, Brookfield Township, Noble County, Ohio

Figure 4-1h. Wetlands and Waters Impact Map - southwest



LEGEND

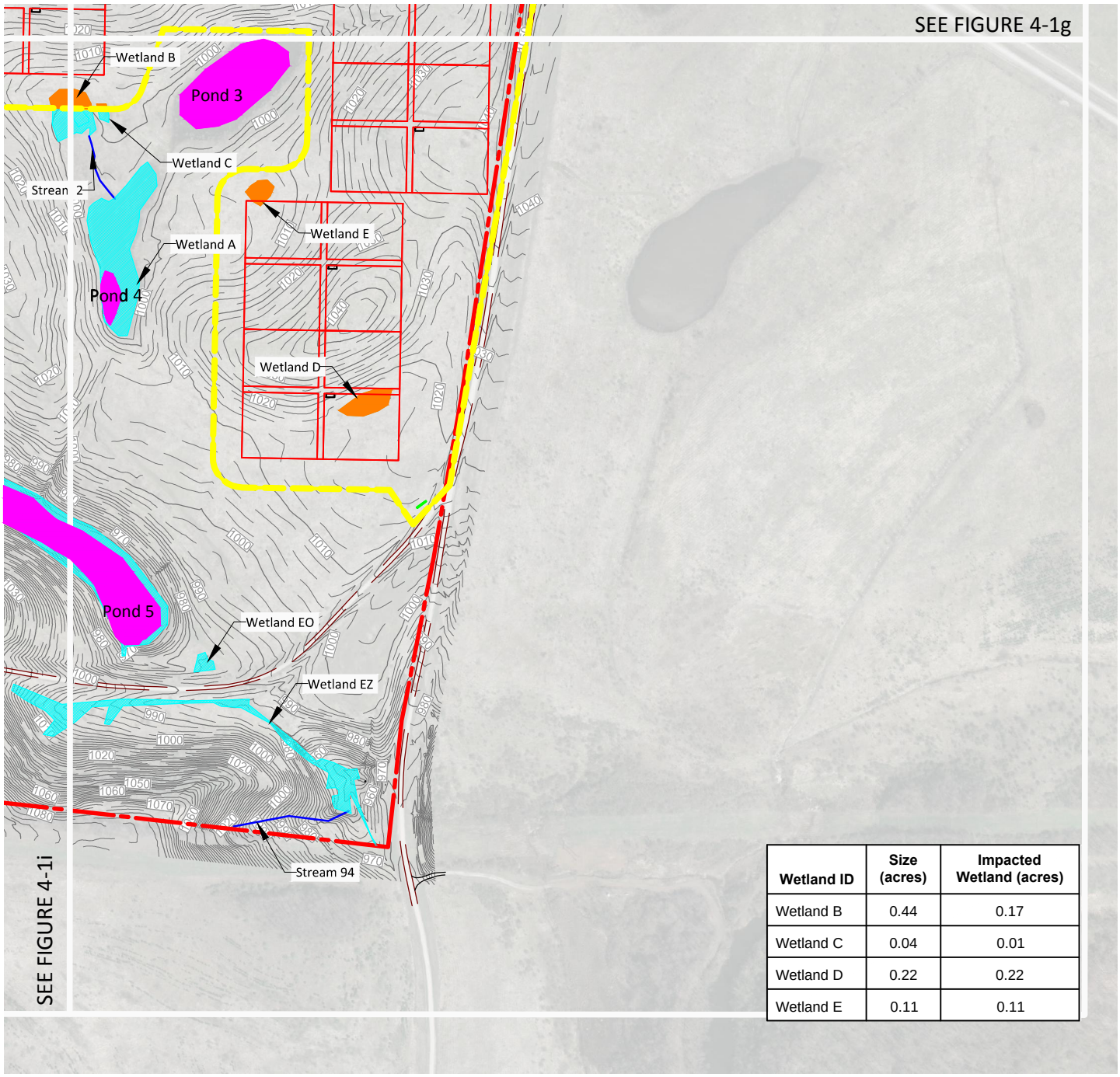
- Wetland
- Impacted Wetland
- Pond
- Stream
- Impacted Stream
- Transmission Line Spanning (Wetland DX)
- Jurisdictional Status Wetland or Stream (Wetland AP)
- Outer Perimeter
- Grading Boundary
- Transmission Line Easement
- Transmission Line
- Solar Panel

N

0 125 250 500 1,000

Agile Energy, Turning Point Solar Project, Brookfield Township, Noble County, Ohio

Figure 4-1i. Wetlands and Waters Impact Map - south-central



Wetland ID	Size (acres)	Impacted Wetland (acres)
Wetland B	0.44	0.17
Wetland C	0.04	0.01
Wetland D	0.22	0.22
Wetland E	0.11	0.11

LEGEND

- Wetland
- Impacted Wetland
- Pond
- Stream
- Impacted Stream
- Transmission Line Spanning (Wetland DX)
- Jurisdictional Status Wetland or Stream (Wetland AP)
- Outer Perimeter
- Grading Boundary
- Transmission Line Easement
- Transmission Line
- Solar Panel

N

0 125 250 500 1,000

Agile Energy, Turning Point Solar Project, Brookfield Township, Noble County, Ohio

Figure 4-1j. Wetlands and Waters Impact Map - southeast

Table 4-2 Summary of Jurisdictional and Non-Jurisdictional Streams Impacted by the Solar Facility Construction

Strm #	Fig. #	Stream ID	Preliminary Jurisdictional Status	Stream Type	HHEI Score	Impacted Stream (linear feet)	Preliminary Primary Headwater Habitat Classification
1	4-1f	Stream 100	Isolated	Intermittent	54	1,196 of 2,312	Modified Class II Primary Headwater Habitat
		Total Isolated Stream Impacts				**1,196 of 2,312**	

Table 4-3 Summary of Ponds Impacted by the Solar Facility Construction

Pond #	Fig. #	Pond ID	Preliminary Jurisdictional Status	Total Size (acres)	Impacted Pond (acres)
1	4-1f	Pond 6	Isolated	0.11	0.11
2	4-1f	Pond 7	Isolated	0.05	0.05
3	4-1f	Pond 8	Isolated	0.02	0.02
		Total Isolated Ponds		**0.18**	**0.18**

Of the 75 wetlands, one (1) stream and three (3) ponds that would be impacted by the construction of the solar facility, 74 wetlands, the stream and all three ponds were preliminarily deemed isolated and thus, do not possess a significant nexus to a relatively permanent waterway (i.e., a perennial stream) or traditionally navigable waterway (e.g., the Ohio River). The remaining wetland was preliminarily considered continuous with streams that drain off-site. Based on an examination of available imagery (i.e., USGS topographic maps, aerial photography, etc.), these streams eventually drain to the Ohio River, and thus, this wetland was deemed "waters of the U.S." and is subject to regulations pursuant to Section 404/401 of the Clean Water Act. However, the U.S. Army Corps of Engineers (USACE) makes the final determination of the jurisdiction of a wetland, stream, or other waters.

All of the wetlands, both isolated and jurisdictional, to be impacted by the Project are considered Category 1, the lowest category. The average overall size of wetlands impacted is 0.07 acre, with the average impact being 0.06 acre. In total, 75 small wetlands would be converted for a total impact of 4.767 acres.

The stream impacted is considered to be intermittent. It is also considered Modified Class II Primary Headwater Habitat. Project Area streams generally developed following strip mine reclamation activities. A stormwater drainage system has been designed for the Project to match existing drainage patterns. It is therefore likely that the linear footage of streams impacted would essentially be replaced onsite with the new drainage system. This stormwater drainage system would be designed using natural channel design, where appropriate, to be used as part of the stream mitigation for the stream impacts.

Transmission for the Project would require the construction of an approximately 1.87 mile 69 kV transmission feeder line within a 100-foot wide corridor to the South Cumberland substation. The proposed transmission line would be supported by 60-foot tall wood monopole structures that

would be spaced approximately 250-300 feet apart. In addition, approximately 1.29 miles of the proposed corridor would be located immediately adjacent and parallel to an existing 69 kV electric transmission line ROW, but it would not involve the rebuilding or replacement of the existing electric transmission line. The new transmission feeder line would span 13 wetlands, eight streams and one pond, but no construction activities will occur or fill will be placed in these resources, and no access roads would cross these areas. Therefore, the spanning does not constitute a Section 404 impact or conversion.

Table 4-4 Summary of Jurisdictional and Non-Jurisdictional Wetlands Spanned by the 69 kV Transmission Line

Wet. #	Fig. #	Wetland ID	Prelim. ORAM score	Provisional Wetland Category	Preliminary Jurisdictional Status	Covertype	Total Size (acres)	Wetland Spanned (acres)
1	4-1b	Wetland DI	17.5	One	Jurisdictional	Emergent	0.11	0.04
2	4-1e	Wetland DG	23	One	Jurisdictional	Emergent	0.29	0.11
3	4-1e	Wetland DX	36	Modified Two	Jurisdictional	Scrub-shrub	0.41	0.28
4	4-1e	Wetland DY	28	One	Jurisdictional	Emergent	0.003	0.003
5	4-1e	Wetland DZ	37	Modified Two	Jurisdictional	Emergent	0.31	0.19
6	4-1e	Wetland EA	25	One	Jurisdictional	Emergent	0.08	0.04
7	4-1e	Wetland EB	24	One	Jurisdictional	Emergent	0.29	0.05
8	4-1e	Wetland EC	18	One	Jurisdictional	Emergent	0.02	0.01
9	4-1e	Wetland EF	26	One	Jurisdictional	Emergent	0.01	0.01
10	4-1e	Wetland EG	30	One/Two Gray	Jurisdictional	Emergent	2.51	0.04
11	4-1e	Wetland EH	25	One	Jurisdictional	Emergent	0.03	0.03
12	4-1e	Wetland EI	28	One	Jurisdictional	Emergent	0.25	0.04
13	4-1e	Wetland EK	13	One	Jurisdictional	Emergent	0.06	0.01
		Totals, Jurisdictional Wetlands					**4.37**	**0.85**

Table 4-5 Summary of Streams Spanned by the Transmission Line Corridor

Strm #	Fig. #	Stream ID	Prelim. Jurisdictional Status	Spanned Stream (linear feet)	Stream Type
1	4-1e	Stream 23	Jurisdictional	1,357 of 2,362	Perennial
2	4-1e	Stream 27	Jurisdictional	25 of 44	Intermittent
3	4-1e	Stream 28	Jurisdictional	32 of 80	Intermittent
4	4-1h	Stream 54	Jurisdictional	100 of 2,682	Perennial
5	4-1h	Stream 66	Jurisdictional	220 of 220	Intermittent
6	4-1h	Stream 82	Jurisdictional	68 of 605	Intermittent
7	4-1h	Stream 84	Jurisdictional	113 of 1,513	Perennial
8	4-1h	Stream 86	Jurisdictional	58 of 470	Intermittent
		Total Stream Lengths Spanned		**1,973 of 7,976**	

Table 4-6 Summary of Ponds Spanned by the Transmission Line Corridor

Pond #	Fig. #	Pond ID	Preliminary Jurisdictional Status	Total Size (acres)	Impacted Pond (acres)
1	4-1b	Pond 12	Jurisdictional	1.00	0.12
		Total Jurisdictional Ponds		**1.00**	**0.12**

TPS has modified a previous design and layout of the solar field to avoid and minimize impacts on wetlands, streams and ponds, especially those of jurisdictional status. The project will require a Nationwide permit from USACE. An isolated wetlands permit will also be required from the State of Ohio. These permits will ensure that the functions and values of the impacted aquatic systems will be replaced via mitigation agreed to by USACE and OEPA through the Clean Water Act Section 404 permit process (USACE) and the Ohio Isolated Wetland permit process (OEPA), respectively. Mitigation opportunities are currently being investigated onsite and at nearby areas. Permit applications will be submitted to these agencies early in 2012. A Conceptual Mitigation Plan will become part of the respective permit applications that will be submitted to these agencies. Permit applications are expected to be submitted to USACE and OEPA in early 2012.

4.3.1.3 Wetland Finding

This wetland finding has been written in compliance with Executive Order 11990, "Protection of Wetlands." The Project Site Selection Study is described in **Section 2.4**. One of the site selection criteria in that Study was to avoid and/or minimize impacts on water of the U.S. to the extent practicable. Although the Study revealed that Site 2 (the Project Area) had ponds, streams, and scattered small wetlands, it was ranked number two out of three for this criterion and was selected for its overall suitability as the Project Area. None of the three sites would have allowed complete avoidance of wetlands and streams.

For the Selected Site, a site layout was overlain on the wetlands/waters delineation for the Project Area, resulting in impacts to about one-quarter acre of jurisdictional wetlands and over 1,000 linear feet of jurisdictional streams. The layout was revised to avoid all jurisdictional stream impacts and to minimize jurisdictional wetland impacts to 0.01 acre. A description of the Project Areas wetlands and streams is provided in **Section 3.3.1.2**. Impacts to wetlands and streams are identified in **Section 4.3.1.2**. Permit requirements and proposed mitigation are also discussed in **Section 4.3.1.2.** Based upon the above considerations, it is determined that there is no practicable alternative to the proposed construction in wetlands and that the proposed action includes all practicable measures to minimize harm to wetlands which may result from such use.

4.3.1.4 Cumulative Impacts

Other past and present actions that have impacted wetlands and streams in the region include the coal strip mining that took place from the 1960s through the late 1980s that resulted in the current conditions of the Project Area. No other reasonably foreseeable future actions that would affect wetlands or streams are currently known. All impacts to wetlands and streams by the Project as well as future projects are expected to be mitigated through compliance with Section 404/401 regulations. Considering the low quality of onsite streams and wetlands that are to be impacted, the impact to 0.01 acre of jurisdictional wetlands, 4.767 acres of isolated wetlands, and

1,196 feet of isolated headwaters streams, when combined with compensatory mitigation and added to other past, present, and reasonably foreseeable future actions, would be minor.

4.3.2 Floodplains

4.3.2.1 No Action
The No Action alternative would have no short- or long-term impacts to floodplains since no new construction would occur.

4.3.2.2 Construction and Operation Impacts
The Project is not located within designated floodplains; therefore, no impacts to floodplains would occur.

4.3.2.3 Cumulative Impacts
Because there are no direct or indirect impacts to floodplains, no cumulative effects on floodplains would accrue.

4.3.3 Water Supply and Discharge

4.3.3.1 No Action
The No Action alternative would have no short-term or long-term impacts to water quality since no new construction would occur.

4.3.3.2 Construction and Operation Impacts
No sole source aquifers or drinking water source protection areas for community, non-community, and residential wells are located within the Project Area and thus no impacts will accrue to these resources due to Project construction or operations.

Minimal amounts of hazardous waste will be generated by the Project. These may include solvents, lubricating oils and paints, but they will be collected and disposed of in an appropriate location in accordance with an approved spill prevention, countermeasures, and control plan. Because of the shallowness of surface water at the site, a slight potential exists for water contamination in the event of an accidental release.

A stormwater drainage system designed to match existing drainage patterns and meet all federal, state and local regulations will be employed. It will collect all rainwater from the Project site and will direct that flow to locations away from the facility. Stormwater discharges from construction activities are subject to Best Management Practices (BMPs) designed and implemented for construction activities.

A septic tank and leach field would be constructed alongside the Phase 1 laydown area near the O&M building. The septic tank would be procured locally and would conform to all federal, state, and county requirements for configuration, fittings, and approved vendors. The septic leach field would be sized according to good engineering practice and county requirements, and it would be based on percolation data obtained from tests conducted in the proposed leach field location.

The corridor for the proposed 1.87-mile 69 kV transmission feeder line partially parallels and sometimes crosses Rannells Creek and could potentially impact water quality within the Project Area from the use of herbicides during maintenance operations associated with the proposed transmission line corridor. Herbicide application would be accomplished according to label directions by a licensed professional to guard against contamination of water resources within the proposed Project Area. The weather would be monitored to ensure conditions were favorable for application. In addition, contractors would perform the following tasks in order to reduce potential impacts to water resources within the Project Area:

- Apply herbicides a minimum of 30 feet from lakes, ponds, wetlands, perennial or intermittent springs, seeps, or streams
- Apply herbicides a minimum of 100 feet from any public or domestic water source
- Mix, load, or clean herbicides approximately 200 feet from any open water, or public or domestic water source

These measures would reduce or eliminate the potential for adverse impacts due to the use of herbicides.

Construction and operation of the Project would minimally impact surface water features along the transmission line route. All streams crossed by the proposed corridor are narrow enough that they could easily be spanned with normal spacing of the structures and can be avoided by access roads. Short-term, minor water quality impacts may occur during the construction of the Project. These impacts would be associated with soils from disturbed areas being washed by storm water into adjacent waters during rainstorm events. Increased turbidity and localized sedimentation of the stream bottom may occur from the runoff. However, these impacts would be temporary and would not significantly alter water quality conditions. Additionally, mitigation measures proposed in **Section 5.0** would prevent or minimize these water quality impacts. The construction and maintenance of the proposed solar facility, substation, and transmission feeder line would not disturb any subsurface waters.

4.3.3.3 Cumulative Impacts

Rannell's Creek is considered warmwater habitat (WWH) according to the OEPA's use designation (OEPA 2011), despite the extensive strip mining that this area experienced from the 1960s to the late 1980s. Rigorous application of BMPs to prevent erosion and sedimentation would be expected on any large, future development projects, although none are currently foreseen. Erosion and sedimentation from the proposed solar facility, substation, and transmission line would be minimized by rigorous application of BMPs, including those required by the National Pollutant Discharge Elimination System (NPDES) permitting and preparation of stormwater pollution prevention plans. Construction and operation of the 1.87-mile 69 kV transmission feeder line would provide an additional source of potential herbicide usage in the area. However, the herbicide usage would be strictly controlled by adherence to label directions and mitigation measures. Therefore, the impact of the Project, when added to other past, present, and reasonably foreseeable future actions affecting water quality, would not be significant.

4.4 BIOLOGICAL RESOURCES

4.4.1 Vegetation

4.4.1.1 No Action

The No Action alternative would have no short- or long-term impacts to vegetation because no construction would occur, and no clearing or alteration of vegetation would be required.

4.4.1.2 Construction and Operation Impacts

Construction, operation, and maintenance of the solar facility would result in the short- and long-term loss of native and non-native vegetation. All of the Project Area has been previously impacted by strip-mining and reclamation. Following the completion of construction, most of the solar facility site would be re-vegetated with both native grasses and other native herbaceous vegetation in order to minimize wind and water erosion, to provide competition with noxious weeds, and to enhance aesthetics. Long-term loss of native vegetation would be an extremely minor impact because the vegetation types are common in the area and most of the acreage affected by initial grading would essentially be revegetated to a similar species composition upon completion of construction.

Construction and maintenance of 1.29 miles of the proposed transmission line would occur adjacent to an existing transmission line corridor; therefore, some impacts to vegetation types within the new transmission line corridor are expected. Existing immature forest vegetation would be trimmed so as not to interfere with the new transmission line. Since some low-growing shrub and herbaceous vegetation would not be removed, it could be damaged by construction equipment and vehicular movement during construction. Following construction, the new corridor would be allowed to recover as herbaceous or shrub-scrub vegetation.

Herbicide use for control of targeted woody-stemmed vegetation would be extended from the existing transmission line corridor to the new corridor. Non-target plants could be impacted from over spray, drift, or accidental discharge. Through proper application techniques, however, such impact can be minimized and managed under proper environmental conditions. All herbicides, where required, would be applied in accordance with applicable federal and state regulations. Construction and maintenance of 0.58 miles of the proposed transmission feeder line would occur along the non-forested roadside of Chapel Drive. Thus, impacts along this stretch would be to previously disturbed, mainly herbaceous vegetation.

4.4.1.3 Cumulative Impacts

Other past and present actions that have affected the vegetation of this part of Noble, Muskingum, Morgan, and Guernsey counties include strip mining for coal, most of which occurred from the 1960s through the late 1980s. No other reasonably foreseeable proposed actions are planned that would affect large acreages of the natural vegetation of the area. As a result, no adverse cumulative effects are expected from the construction of the proposed solar facility or transmission feeder line.

4.4.2 Wildlife

4.4.2.1 No Action
The No Action alternative would have no short- or long-term impacts to wildlife because no construction would occur.

4.4.2.2 Construction and Operation Impacts
Construction and maintenance of the solar facility and transmission line could result in some minor impacts to wildlife. The proposed solar facility site is currently vegetated as grassland and, as such, construction of the facility would neither impact high quality wildlife habitat nor have any significant impact on wildlife species. The only wildlife in the vicinity of the proposed solar facility includes deer, small birds, reptiles, and mammals, all of which could move into outlying vegetation areas.

As discussed in **Section 3.4.1**, a late-1970s study of wildlife in reclaimed strip mined areas of southeast Ohio found that small mammal numbers were significantly increased by practices instituted after the 1972 reclamation laws. This small mammal population in turn supported a larger population of predators, such as hawks, owls, foxes, and weasels. Upon completion of construction of the solar facility, the site will be re-vegetated to a similar composition as currently exists, and habitat for this small mammal community and the predators it supports will essentially be restored. Only species too large to crawl through or under (or fly over) the facility perimeter fence would be excluded (e.g., deer). Since thousands of acres of similar habitat surround the proposed facility site, this is not considered a significant impact. Therefore, other than temporary minor effects to wildlife caused by noise and human activity, no significant impacts are expected from the construction and maintenance of the solar facility.

Deer, birds, and other wildlife species moving through the Project Site would be temporarily impacted by the noise and human activity associated with the construction phase of the Project. Construction of the transmission feeder line alongside the existing corridor would have a similar effect on fauna species.

Human presence and activity during construction would disturb and displace wildlife in the area of construction. However, impacts to most species would be temporary and short-term in nature, limited to the construction phase and would consist primarily of displacement and disturbance. Some less mobile species occurring in the construction corridor could be directly impacted, and movements between habitat areas could be temporarily impeded due to noise and human presence. Additional temporary disturbances could occur during future maintenance activities along the transmission feeder line. In sum, other than temporary minor effects to wildlife caused by noise and human activity, no impacts are expected from the construction and maintenance of the Project.

4.4.2.3 Cumulative Impacts
Other past and present actions that have historically affected wildlife habitat in this part of Noble, Muskingum, Morgan, and Guernsey counties is strip mining for coal, most of which occurred from the 1960s through the late 1980s. In addition, large-scale restoration activities have also taken place over former strip mine land, which resulted in beneficial effects to wildlife.

However, no large-scale wildlife habitat disturbances are reasonably foreseeable and the Project is not expected to negatively affect any wildlife population trends in the area. Therefore, cumulative impacts to wildlife within the Project Area are expected to be minimal.

4.4.3 Threatened and Endangered Species

4.4.3.1 No Action

The No Action alternative would have no short- or long-term impacts to threatened and endangered species because no construction would occur.

4.4.3.2 Construction and Operation Impacts

As described in **Section 3.4.2**, one federally endangered species and one federally protected species are known or suspected to occur within Noble County. These species are the Indiana bat (endangered), the bald eagle, and the golden eagle (Bald and Golden Eagle Protection Act; Migratory Bird Protection Act). State-listed species known or suspected to occur within Noble County include the endangered Indiana bat, the Northern harrier, the black bear, and the bobcat, as well as the threatened bald eagle.

However, species information on habitats, ranges, and accounts listed in **Section 3.4.2** suggests that none of the listed species is likely to potentially be impacted by the Project. Based on a review of the Project Area, the construction and operation of the solar facility is not expected to cause any impacts to threatened and endangered species or their critical habitats. With the exception of the bobcat, which has a record from 1994, none of the federal or state listed threatened, endangered, or species of concern have been observed within the Project Area.

Concerning the black bear and the bobcat, ODNR has commented: "However, due to the mobility of these species, the Project is not likely to have an impact on these species." Concerning the black Bald eagle, ODNR has commented: "…the Ohio Biodiversity Database currently has no records of this species near the Project Area."

Concerning the Indiana bat, ODNR has commented: "If suitable trees occur within the Project Area, these trees must be conserved. If suitable habitat occurs on the Project Area and trees must be cut, cutting must occur between September 30 and April 1. If suitable trees must be cut during the summer months of April 2 to September 29, a net survey must be conducted in May or June prior to cutting. If no tree removal is proposed, the Project is not likely to impact this species." Some tree-cutting will be required to clear the new transmission feeder line corridor. TPS has committed that this cutting will occur only between September 30 and April 1 to preclude any potential impact to Indiana bat habitat (see **Section 5.0**). By committing to this mitigation, the Project would likely have no adverse effects to the species.

Concerning the Northern harrier, ODNR has commented: "if this type of habitat (grasslands) will be impacted, construction must not occur in this habitat during the species' nesting period of May 15 to August 1. If this habitat will not be impacted, the project is not likely to impact this species. TPS has committed to implement this mitigation measure, as documented in **Section 5.0**. Therefore, grading of new, ungraded areas will not take place during this time period, but grading that was started prior to this time period will continue.

The Wilds, one of the largest (about 10,000 acres) wildlife conservation centers in the world, is located approximately three miles west of the Project Area. It is home to rare and endangered species from around the world as well to hundreds of indigenous Ohio species, all of which live in natural, open-range habitat. Three thousand federal endangered American burying beetles (ABB) were recently released at The Wilds. Additional releases are planned to occur at The Wilds in each of the next four years. However, the Final Cooperative Agreement between The Wilds and USFWS states that American burying beetles: "…may be incidentally taken as a result of incompatible land management practices or vehicular traffic and these forms of take are discussed and exempted in our intra-Service biological opinion. Any beetle that leaves Cooperators' property and enters adjacent lands will be considered lost to the program unless it can be located, recaptured, and returned to the release area."

4.4.3.3 Cumulative Impacts

Other past and present actions that have historically affected threatened and endangered species habitat in this part of Noble, Muskingum, Morgan and Guernsey counties is strip mining for coal, most of which occurred from the 1960s through the late 1980s. However, no large-scale habitat disturbances are reasonably foreseeable. In fact, since the cessation of strip mining and the completion of reclamation activities, wildlife habitat in general and for the Indiana bat in particular, has increased incrementally through natural succession and the lack of disturbance due to the absence of development. The Project is not expected to negatively affect any threatened and endangered species population trends in the area. Therefore, cumulative impacts to threatened and endangered species within the Project Area are expected to be minimal.

4.5 AIR QUALITY

4.5.1 No Action

The No Action alternative would have no short- or long-term impacts to air quality because no construction would occur.

4.5.2 Construction

The following sections provide information that directly relate to the Project's construction emissions including, but not limited to: construction schedule and phasing; necessary equipment and mobile sources; mobilization of equipment; installation of transmission lines and solar blocks; and grading.

4.5.2.1 Construction Schedule and Phasing

Construction of the Project, from site preparation and grading to commercial operation, is expected to occur in phases. As discussed above, the project is expected to be constructed in phases over a three year period. However, it is possible that construction could be expedited.

Table 4-7 Assumed Project Milestones

Activity	Date
Begin Construction	November 2012
Initial Energy Delivery	May 2013
Commercial Operation	October 2013

The Project construction schedule is represented by the **Table 4-8** below. Should construction be phased over three years the transmission line, administration building and substation would be constructed in Year 1. Other construction activities including clearing, grading and installation would occur in all years.

Table 4-8 Estimated Construction Schedule

Construction Phase	Construction Time (months)											
	1	2	3	4	5	6	7	8	9	10	11	12
Clear and Grub, Site Survey layout	■											
Temporary Power	■											
Transmission Line	■	■	■									
Substation	■	■	■									
Rough Grading	■	■	■	■	■							
Fine Grading		■	■	■	■	■	■	■	■	■	■	■
Install Support Posts & Frame			■	■	■	■	■	■	■	■	■	■
Install Modules				■	■	■	■	■	■	■	■	■
Trenching and Backfill				■	■	■	■	■	■	■	■	■
Administration Building									■	■	■	■
Complete Construction												■

Construction activities are discussed in greater detail in the following sections.

4.5.2.2 Construction Equipment

Estimates of the construction equipment, both on- and off-road vehicle inventories, and personnel required to construct the Project. The maximum estimated construction fleet for any construction year is provided in **Table 4-9**.

Table 4-9 Estimated Construction Equipment and Labor Schedule

Description	HP	Fuel	hr/ day	Construction Time (Months)											
				1	2	3	4	5	6	7	8	9	10	11	12
Personal Vehicles	250	G	1	20	40	60	80	80	80	80	80	80	80	80	60
Pickup (1/2 ton)	350	G	8	4	4	4	6	6	8	8	8	8	8	8	6
Pickup (3/4 ton)	350	D	8	2	2	3	4	4	4	4	4	4	4	4	3
Pickup (1 ton)	350	D	8	1	1	3	4	4	4	4	4	4	4	4	3
Water Truck	350	D	8	2	2	2	2	2	1	1	1	1	1	1	1

Table 4-9 Estimated Construction Equipment and Labor Schedule

Description	HP	Fuel	hr/ day	Construction Time (Months)											
				1	2	3	4	5	6	7	8	9	10	11	12
Tractor with Mower	300	D	8	1											
Motor Grader	200	D	8	1	1	1	1	1	1	1	1	1	1	1	1
Dozer	400	D	8	1	2	2	2	1							
Pan Scraper	300	D	8	2	4	4	4	2							
Compactor	300	D	8	1	2	2	2	1							
Front End Loader	200	D	6	1	2	2	2	1							
Backhoe with Loader	100	D	6	2	2	2	2	2	2	2	2	2	2	2	2
Dump Truck	350	D	6	2	2	2	2	2	2	2	2	2	2	2	2
Trencher	100	D	4	1	2	3	4	4	4	4	4	4	3	2	1
All Terrain Forklift	100	D	4	1	1	2	4	4	4	4	4	4	2	1	1
Semi Delivery Truck & Trailer	350	D	4	1	1	2	3	3	3	3	3	3	2	2	1
Concrete Delivery Truck	350	D	4	1	2	3	4	4	4	4	4	4	3	2	2
Power Line Truck	350	D	6	2	2	2	2	2	2	2					
Total				46	72	99	128	123	119	119	117	117	112	109	83
Construction Labor			8	30	60	80	100	100	100	100	100	100	100	100	80

4.5.2.3 Mobilization of Construction Equipment and Building Materials

It is expected that the majority of construction equipment listed in **Table 4-9** above is readily available within a 30-mile radius of the site from the communities of Caldwell and Byesville, Ohio. The majority of the equipment would be delivered by semi-tractor trailer combination vehicles. Construction materials, including concrete to be delivered by ready mix trucks, would most likely be traveling from these same communities. It is expected that the majority of special backfill materials including sand and gravel is also readily available within 30 miles of the site and would be delivered by semi-tractor trailer trucks or dump trucks. General building materials needed for the administration/maintenance building should be readily available in the surrounding communities within this 30-mile radius. If this equipment cannot be secured from within a 30-mile radius, TPS would expand the radius to 100 miles, with the provison that it would aim to utilize Ohio sourced products to the greatest extent practicable.

The solar panels are planned to be manufactured in Napoleon, Ohio, a town approximately 250 miles from the job site. The panels would need to be delivered by semi-tractor trailer trucks. The associated framing to support the solar panels would most likely be delivered from within the state of Ohio, no more than 250 miles from the job site.

Major electrical equipment including transformers and inverters should be available within the continental U.S. and would be delivered by semi-tractor trailer trucks. Similarly, power poles for the transmission line should be available in Columbus, Ohio, approximately 100 miles from the job site and would be delivered by semi-tractor trailer truck.

As mentioned above, with the exception of inverters, which are expected to come from within the continental United States, the project will strive to utilize, to the greatest extent practicable, the local Ohio supply chain.

4.5.2.4 Installation of Transmission Lines and Solar Block Operations

It is anticipated that the substation and transmission line would be installed during the first three months of construction in year 1. Operation could start during the fourth month, since solar blocks would be brought online as soon as they are completed, subject to financial closing per individual block(s) and substation interconnection being completed at the South Cumberland Substation. The operation of the site during construction would have limited impact compared to the remaining work being done on the project site.

4.5.2.5 Grading

Construction-related grading would result in the disturbance of approximately 400 acres over the construction period. Rough grading would be done by large dozers and scrapers, whereas fine grading would be accomplished by motor graders, loaders, and backhoes. Trenching would be accomplished by self-propelled trenchers and backhoes. Depths of cuts and fills would vary throughout the site between one and ten feet depending upon the location. Special attention would be made for the placement and alignment of the solar panels to follow the existing contours of the land, where possible, to reduce earth moving operations.

4.5.3 Project Operation and Maintenance

4.5.3.1 Facility Operations

It is anticipated that AEP Ohio would rely on up to six existing full time employees from other power plants in the area to remotely monitor the solar facility, manage staff, and maintain and replace equipment, as needed. A list of anticipated operations equipment & personnel is provided as **Table 4-10**. In addition, a self-contained 750 horsepower diesel-fired emergency generator is anticipated to run a fire pump and supply power to the administration building, if needed.

Table 4-10: Operations Equipment & Personnel List

Description
2 to 5 - Personal Vehicles - 100 to 350 hp +/- (cars/pickups - gas) (1 hr/day & 5 days/week)
2 - Utility Vehicles - 50hp +/- (gas) (8 hrs/day & 5 days/week)
1 - Pickup - 350 hp +/- (1/2 ton - gas) (8 hrs/day & 5 days/week)

Table 4-10: Operations Equipment & Personnel List

Description
2 - Pickups - 350 hp +/- (1 ton - diesel) **(8 hrs/day for 25 days/year to wash solar panels)**
1 - Riding Lawnmower - 25 hp +/- (gas) **(8 hrs/day for 130 days/year for maintenance)**
4 to 6 Full Time Employees

4.5.3.2 Maintenance

Module washing would occur a maximum of once per year during daylight hours and, if needed, would be performed using the existing vehicle fleet listed above. No solvents or other chemicals would be used. Modules would be sprayed with high-pressure water and agitated with a brush to loosen dust and dirt, then sprayed again to wash clean. Module washing crews would traverse the site in a lightweight to medium-duty truck which would be fitted with the pressure washer sprayer and cleaning brush system. Module washing activities would be short in duration in any one area on the Project Site. Water used to wash the panels would fall to the ground and evaporate or be absorbed into the ground. Other routine maintenance activities are anticipated to be minimal and primarily limited to groundskeeping, using a riding lawnmower in the vicinity of the solar module blocks, and upkeep of the modules.

4.5.4 Impacts

4.5.4.1 Significance Thresholds

Table 4-11 presents the readily available significance thresholds that will be used to evaluate the resulting construction and operational emissions. The significance threshold used was the Ohio State modeling significant emission rate used for determining whether or not modeling is necessary for a given project.

Table 4-11 Significance Thresholds

POLLUTANT	AVERAGING PERIOD	OHIO MODELING SIGNIFICANT EMISSION RATE (tons/year)
PM10	Annual	10
	24-Hour	--
Sulfur Dioxide	Annual	25
	24 Hour	--
	3-Hour	--

Table 4-11 Significance Thresholds

POLLUTANT	AVERAGING PERIOD	OHIO MODELING SIGNIFICANT EMISSION RATE (tons/year)
Nitrogen Dioxide	Annual	25
Ozone	1-Hour	
Carbon Monoxide	8-Hour	100
	1-Hour	--

4.5.4.2 Construction Emissions

Pollutant emissions from the Proposed Project's construction would result from activities including site clearance; mobilization of equipment and materials; grading; trenching; employee commuting; wind erosion; erection of structures; material handling; and vehicle travel. These pollutant emissions consist of both gaseous and particulate emissions. The use of general construction vehicles, worker vehicles, and heavy equipment will result in the combustion of gasoline and diesel fuel. Intermittent fugitive particulate emissions are the primary potential emissions associated with construction activities. Potential fugitive emissions would be minimized throughout the site clearing and construction phases through a variety of measures, including low speed limits, roadway watering, site preparation watering/dust suppression, etc.; details on such mitigation are discussed further in **Section 4.5.5**. The potential emissions from construction activities as a whole are limited in nature, as they are temporarye activities that would not continue past the date of completion.

An estimate of construction emissions during any one-year period was conducted for the Proposed Project and is summarized in **Table 4-12**. All estimated emissions are well below the significance thresholds. Details surrounding the provided construction emission estimates are provided in **Appendix B**.

Table 4-12 Estimated Maximum Annual Construction Emissions

Activity	Criteria Pollutants (tons/yr)					
	PM_{10}	$PM_{2.5}$	CO	VOC	NO_x	SO_x
On-Site Vehicle Emissions	0.24	0.23	2.90	0.05	5.30	0.00
On-Site Fugitive Dust Emissions	1.52	0.79				
Off-Site Vehicle Emissions	0.40	0.36	13.50	1.04	9.26	0.02
Total Maximum Annual Emissions	**2.16**	**1.38**	**16.39**	**1.09**	**14.56**	**0.02**
SIGNIFICANT EMISSION RATE	*10*	--	*100*	--	*25*	*25*

4.5.4.3 Operational Emissions

Pollutant emissions from the Proposed Project's operation would primarily be the result of employees commuting to maintain the facility.

An estimate of operational emissions was conducted for the Proposed Project and is summarized in **Table 4-13**. Details surrounding the provided operational emission estimates are provided in **Appendix B**.

Table 4-13 Estimated Maximum Annual Operational Emissions

Activity	Criteria Pollutants (tons/yr)					
	PM_{10}	$PM_{2.5}$	CO	VOC	NO_x	SO_x
On-Site Vehicle Emissions	0.00	0.00	0.37	0.02	0.08	0.00
Emergency Generator	0.001	0.001	0.004	0.001	0.012	0.000
Total Maximum Annual Emissions	**0.004**	**0.004**	**0.372**	**0.026**	**0.090**	**0.000**

Note: Particulate vehicle emissions include combustion exhaust, brakewear, and tire wear emissions.
Emergency Generator tested 12 hours per year.

4.5.6 Cumulative Impacts

TPS has requested information from the Ohio EPA Division of Air Pollution Control regarding potential projects in the vicinity of the Project, and it has not received a reply at the time of this report. The vast majority of emissions from the proposed project are from construction, which is a temporary activity. Given that the Project will not have significant emissions, there would not be a significant cumulative impact.

4.6 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

Potential socioeconomic impacts of the Project include potential new employment as well as environmental justice issues.

4.6.1 Employment

During construction of the Project, local employment will occur in the construction trades, which include electricians, iron workers, and carpenters, and the like. A maximum of 300 people could be working during the peak construction period of the facility, but the average daily workforce during construction is likely to be about 88 people.. It is anticipated that all construction workers would be hired locally or regionally and would commute to the site from nearby towns. Therefore, it is anticipated that construction of the Project would not result in an increase in the number of permanent residents.

Permanent staff required for solar facility operation would be small in number and would not provide significant local employment opportunities since all operational and maintenance activities would be staffed by existing full time employees of AEP Ohio. Thus, there would not be a significant increase in the number of permanent residents in the community.

4.6.2 Environmental Justice

The need to identify environmental justice issues is stated in Executive Order 12898 (EO), entitled “Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations”. The EO states that “each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.” A Presidential

Memorandum accompanying the EO directed agencies to incorporate environmental justice concerns in their NEPA processes and practices.

For this Project, minority populations are identified by examining the racial and ethnic characteristics of the surrounding community. If the community has a minority population that is greater than fifty percent or that is meaningfully greater than the general population of Noble County as a whole, it is identified as having a minority population.

As presented above in **Section 3.6.2**, the proposed facility is located within Census Tract 9685, Block Group 1, Noble County. As shown in **Table 3-10**, within this census block group, the minority population is very low and there are fewer minority residents as compared to Noble County as a whole. Therefore, this Block Group is not considered to have minority populations.

Low-income populations are identified by examining the poverty rate of the surrounding community and comparing it to the poverty rate of the general population of Noble County as a whole. If the community has a poverty rate that exceeds the county rate by ten percent, it is identified as having a low-income population.

As presented **Table 3-11**, the poverty rate for the population within Census Tract 9685, Block Group 1, Noble County was 7.1 percent in 1990 and 12.0 percent in 2000. In comparison, the poverty rate for the population of Noble County as a whole was 16.4 percent in 1990 and 11.4 percent in 2000. Because the poverty rate for the community does not exceed the county rate by ten percent, this area is not identified as having a low-income population.

Since neither minority nor low-income populations have been identified in the area surrounding the Project, these communities are not considered areas of potential environmental justice concern. Therefore, it can be determined that no minority and low-income populations would be disproportionately adversely impacted by the Project.

4.6.3 No Action

The No Action alternative would have no short- or long-term impacts to socioeconomics and environmental justice because no construction would occur.

4.6.4 Construction and Operation Impacts

The construction and operational activities associated with the Project would provide a positive socioeconomic impact in the Project Area. Construction of the solar facility and transmission feeder line would provide necessary economic activity from the increase of construction workers in the area during the construction period. Most of the construction labor would be drawn from neighboring communities of the Project Area. The few operational and maintenance support workers necessary for the new facility already work within the area. Increases in expenditures for local goods and services are expected and would provide some degree of short-term economic support for the local and regional economy.

The proposed electric transmission feeder line is not expected have an impact on the value of the property the new lines would cross, since this property is currently owned by AEP Ohio. Because the construction and operational impacts of this Project are minimal, no

disproportionately high or adverse environmental impacts to low-income or minority populations would result from Project implementation.

4.6.5 Cumulative Impacts

Because the socioeconomic effects of the Project would be minimal and no other reasonably foreseeable large land use changes are anticipated, the cumulative effects would be minimal.

4.7 CULTURAL RESOURCES AND HISTORIC PROPERTIES

In March and August, 2011, URS gathered information from the OHPO on-line mapping system in an effort to locate inventoried cultural resources within the APE. On August 23, 2011, URS archaeologists visited the Project Area to look for above-ground cultural resources, document disturbance, and document the view-shed. Based on the background check, two archaeological sites and two previous cultural resource surveys were identified within the Project Area. In addition, the Brookfield Cemetery was identified within the Project Area. The site visit also confirmed the extensive disturbance of the Project Area due to strip mining.

During the scoping process, RUS sent letters to agencies, which included the OHPO. The letters asked the agencies provide comments on the Project. OHPO responded via phone call, in which they stated that although their agency did not have comments on the Project under NEPA, the requirements of Section 106 of the National Historic Preservation Act require that RUS submit a finding of effects letter to OHPO for concurrence (See **Appendix C**). Based on information included in the cultural resources assessment prepared by URS, RUS determined that the Project would have no effects to historic properties. The OHPO concurred with this finding on December 21, 2011.

4.7.1 No Action

The No Action alternative would have no short- or long-term impacts to cultural resources because no construction would occur. Therefore, Section 106 does not apply.

4.7.2 Construction and Operation Impacts

None of the known cultural resources will be directly affected by the Project. Therefore, construction of the Project will have no effect on cultural resources; existing transmission lines and other development already occur in proximity to the majority of these sites.

Brookfield Cemetery sits along a small stream valley between 920 and 940 feet AMSL. View of the solar facility will be blocked by an intervening ridge which reaches elevations that exceed 1050 feet AMSL (**Figure 4-2**). This was confirmed by the site visit to the Project Area conducted by URS on August 23, 2011 (**Figure 4-3**).

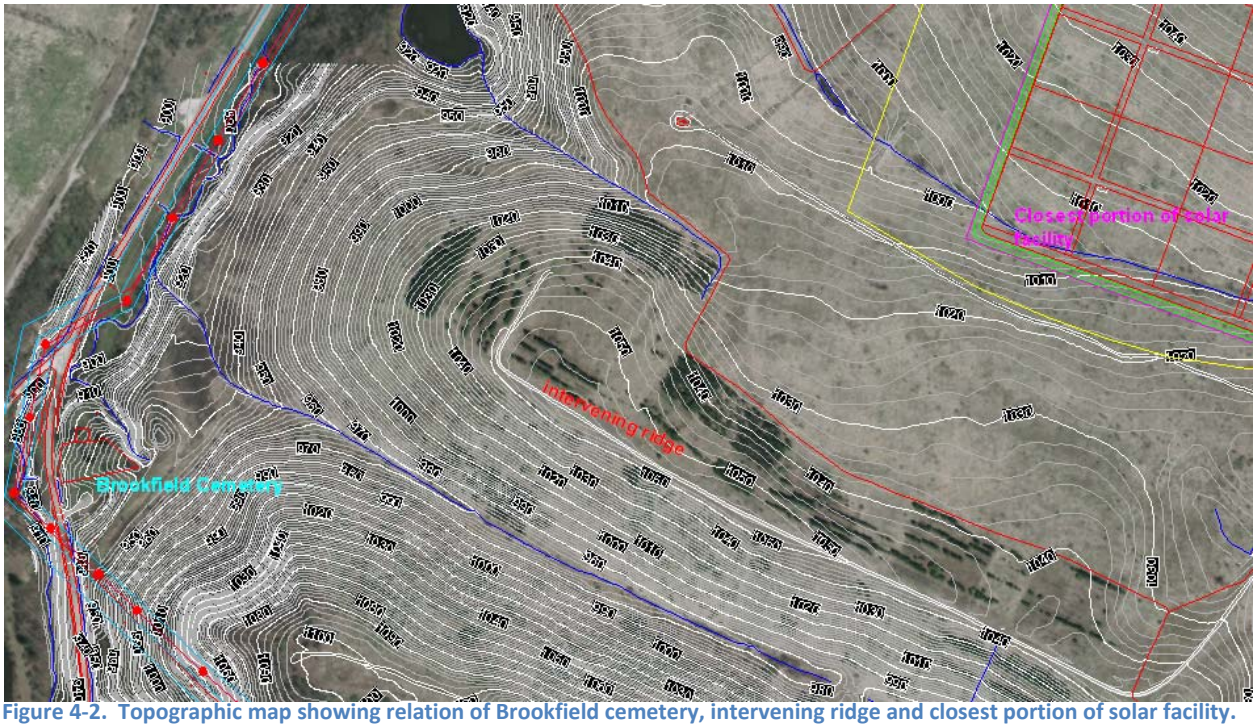


Figure 4-2. Topographic map showing relation of Brookfield cemetery, intervening ridge and closest portion of solar facility.

Figure 4-3 View toward Project site from Brookfield Cemetery. Note intervening ridge capped with trees.

The existing transmission line was routed to avoid impacts on Brookfield Cemetery. Consequently, the proposed adjacent and parallel transmission feeder line and corridor will also avoid impacts to the Cemetery (**Figure 4-4**).

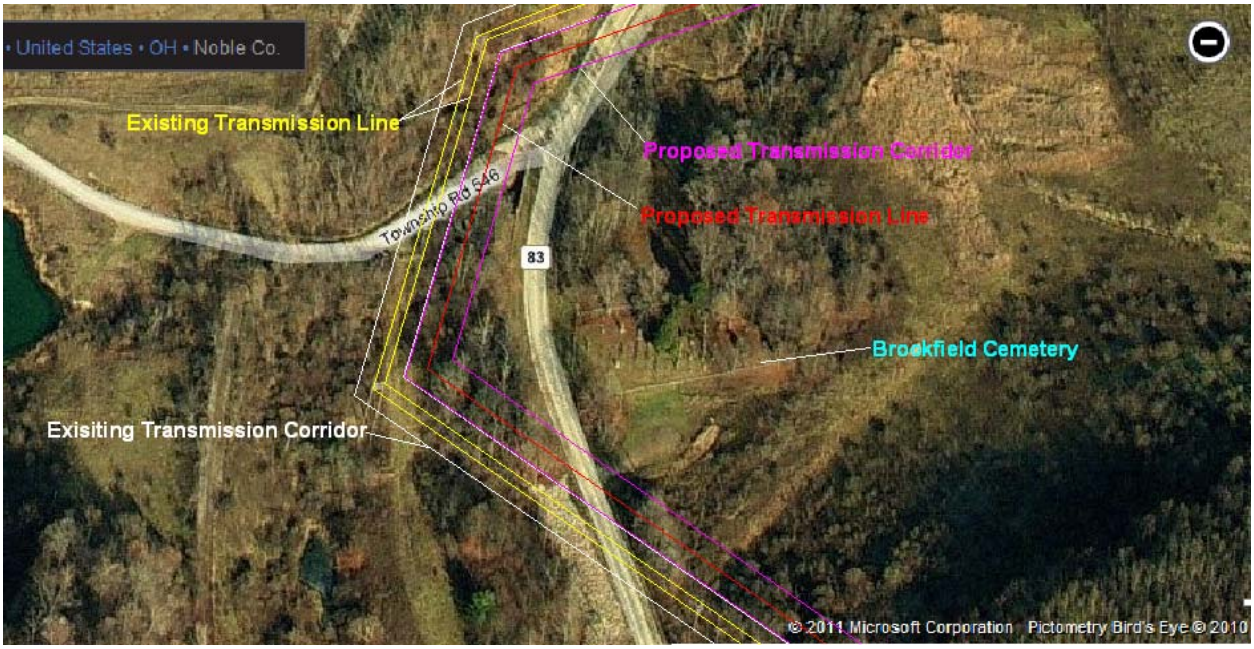


Figure 4-4. Relation of proposed power line and corridor to Brookfield Cemetery.

Based on the above analysis, RUS determined that a finding of no effects to historic properties is appropriate for the Project. This finding was conveyed to OHPO via letter dated November 1, 2011. OHPO concurred with this finding in letters dated December 14 and December 21, 2011 (See **Appendix A**).

4.7.3 Cumulative Impacts

As described above, the Project is expected to have no impacts on cultural resources within the Project Area. As a result, the Project would not have any cumulative effects on cultural resources.

4.8 VISUAL RESOURCES

The solar facility and transmission feeder line would alter the visual landscape. The following sections discuss the impact that these new facilities would have on the visual landscape.

4.8.1 No Action

The No Action alternative would have no short- or long-term impacts to the visual character of the study area because no construction would occur.

4.8.2 Construction and Operation Impacts

Analysis of the potential visual impact was conducted from Key Observation Points (KOPs) that are representative of the visual conditions around the Site. KOPs are locations from which the visual analysis is focused, and they are generally selected to be representative of the most critical or common locations from which the Project would be seen. KOPs were selected in an effort to

evaluate existing landscapes and potential impacts on visual resources with various levels of sensitivity, in different landscape types and terrain, and from various vantage points from which a significant number of people might be able to view the Project.

The types and degree of visual changes that would be caused by the Project are shown in computer-generated photographic simulations on photographs taken from the KOPs. The KOPs that were used to illustrate potentially sensitive viewpoints in the vicinity of the Project are depicted on **Figure 4-5**. The left two photographs in this Figure show existing conditions, while the right two photographs are photographic simulations of the Project.

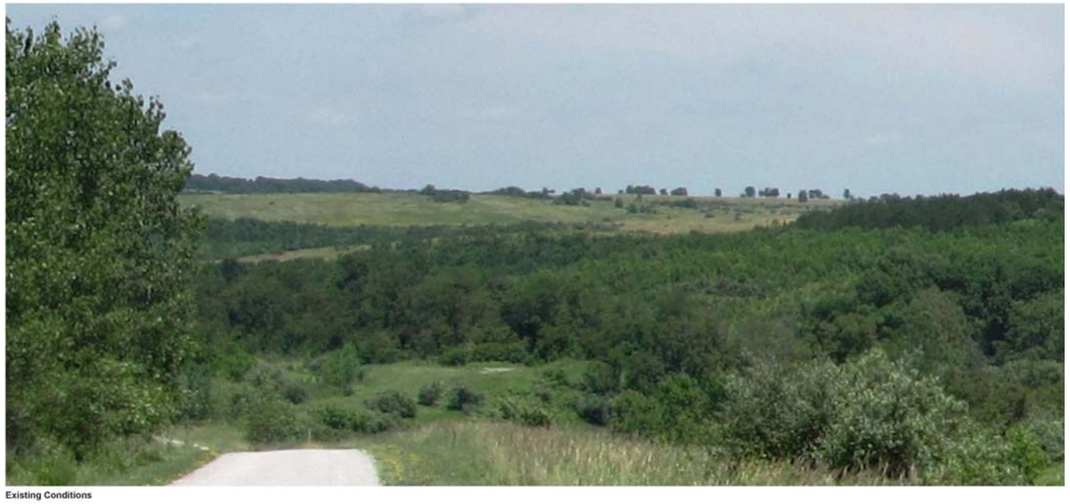
Due to the rolling nature of the landscape and the lack of any residential development in the immediate Project vicinity, no residences currently have a view of the Project Site. Accordingly, viewers would be limited to those traveling on SR 83 and local roads. The location of SR 83 in the Rannells Creek Valley in the vicinity of the Project means that vegetation and topography effectively screen views of the Project to travelers along this road.

The construction of the proposed 1.87 mile long transmission feeder line is not expected to impact the visual character of the Project Area. The proposed line would be supported by wood monopole structures that would aid in blending the line into the surrounding background. In addition, approximately 1.29 miles of the proposed corridor would be located immediately adjacent and parallel to existing electric transmission line ROWs and would not involve the rebuilding or replacement of the existing electric transmission line. The potential visual impact of the sections of the proposed lines that would parallel existing electric transmission lines would also be somewhat mitigated by the visual impact which the existing lines currently have on the area. Additionally, the southernmost 0.67 miles of the proposed line would extend through dense, immature woods that would further screen this section of line. The proposed line would be visible in areas but would not have any impact on the visual quality of the area due to the existing transmission line in the area.

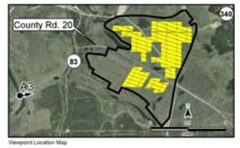
No parks or recognized scenic viewing areas would be affected by the Project.

4.8.3 Reflectivity, Glare, or Dazzle

Reflectivity refers to light that is reflected off surfaces. The potential impacts of reflectivity are glint, glare, or dazzle which can cause a brief loss of vision (also known as flash blindness). The amount of reflectivity varies greatly among solar technologies, with concentrated solar power technologies being highly reflective and photovoltaic technologies (such as this Project) being primarily absorptive. According to the Federal Aviation Authority (FAA), solar energy projects introduce new visual surfaces to the airport setting, where reflectivity could result in glare that causes flash blindness episodes for pilots or air traffic controllers. Thus, potential reflectivity of solar projects requires study during project siting and design. The amount of analysis will depend on site-specific issues (FAA, 2010).



Existing Conditions



Viewpoint Location Map

Legend

- Viewpoint Location
- Project Boundary
- Solar Panel Location

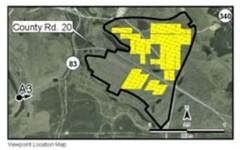
Photograph Information

Time of photograph:	2:30 PM
Date of photograph:	6-30-11
Weather condition:	Partly Cloudy
Viewing direction:	East
Latitude:	39°48'45.41"N
Longitude:	81°40'19.98"W

Existing Conditions from
Key Observation Point A-3

Agile Energy
Turning Point Solar

Simulation



Viewpoint Location Map

Legend

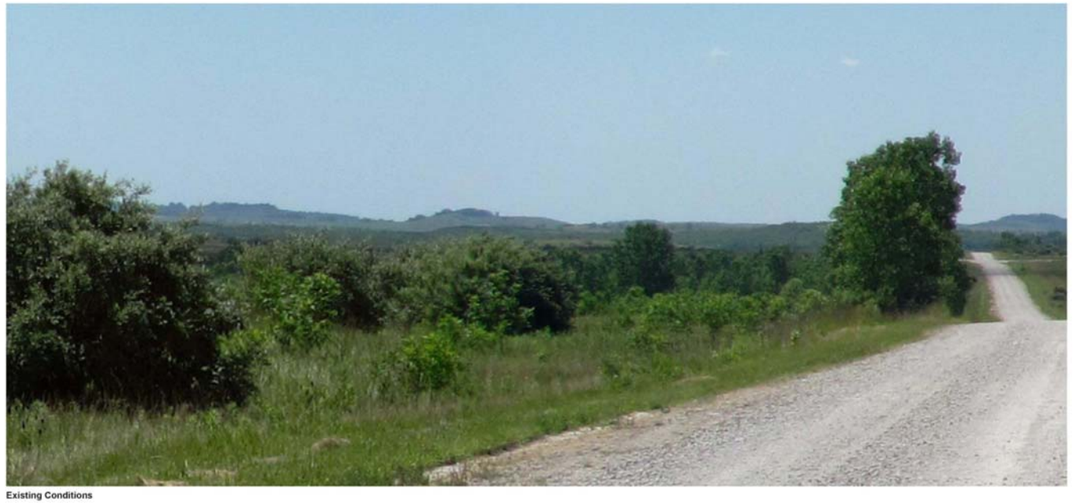
- Viewpoint Location
- Project Boundary
- Solar Panel Location

Photograph Information

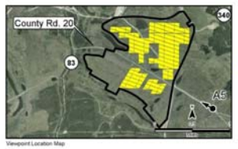
Time of photograph:	2:30 PM
Date of photograph:	6-30-11
Weather condition:	Partly Cloudy
Viewing direction:	East
Latitude:	39°48'45.41"N
Longitude:	81°40'19.98"W

Photographic Simulation from
Key Observation Point A-3

Agile Energy
Turning Point Solar



Existing Conditions



Viewpoint Location Map

Legend

- Viewpoint Location
- Project Boundary
- Solar Panel Location

Photograph Information

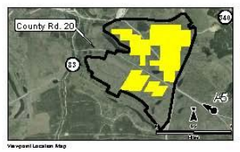
Time of photograph:	2:50 PM
Date of photograph:	6-30-11
Weather condition:	Clear
Viewing direction:	West
Latitude:	39°48'4.78"N
Longitude:	81°38'13.41"W

Existing Conditions from
Key Observation Point A-5

Agile Energy
Turning Point Solar

Figure XX

Simulation



Viewpoint Location Map

Legend

- Viewpoint Location
- Project Boundary
- Solar Panel Location

Photograph Information

Time of photograph:	2:50 PM
Date of photograph:	6-30-11
Weather condition:	Clear
Viewing direction:	West
Latitude:	39°48'4.78"N
Longitude:	81°38'13.41"W

Photographic Simulation from
Key Observation Point A-5

Agile Energy
Turning Point Solar

Figure 4-5 Visual Simulation of the Project

URS

The nearest airport to the Project Area is the Noble County Airport in Caldwell, approximately 6.15 miles away. A UK planning study that assessed many US examples of solar facilities near airports (Spaven Consulting 2011) found that off-airfield ("en route") facilities (such as the Project) are unlikely to present glare/dazzle problems to pilots for the following reasons:

- Dazzle/glare is likely to present a hazard only during critical phases of flight, especially approach and landing; the en route phase is not normally a critical phase.
- Dazzle/glare occurs almost exclusively at low angles of elevation; aircraft in the en route phase of flight will be at higher angles of elevation.
- Pilots in the en route phase are already subjected to glare from a number of existing sources such as large assemblies of parked cars, major glasshouse facilities and large bodies of water; these are not considered to require analysis and mitigation despite having potentially much higher luminosity values than PV panels.
- The pilot view from most cockpits, particularly in the forward direction, is severely limited in the downward direction by the aircraft structure, thus blocking the line of sight to any source of glare on the ground.

The proposed Project would use non-reflective panels to minimize the potential for reflection of light. Accordingly, the construction and operation activity associated with the Project is not expected to cause reflectivity, glare, or dazzle problems for aircraft pilots.

4.8.4 Cumulative Impacts

As described above, the construction and operational activity associated with the Project would have a very minor impact on the visual character of the immediate Project impact area. Therefore, no cumulative effects to visual resources would be expected as a result of the proposed action**.**

4.9 NOISE

4.9.1 No Action

The No Action alternative would have no short- or long-term impacts to noise within the Study Area.

4.9.2 Construction Impacts

Using the method explained in Section 3.1 of the NVS (**Appendix B-2**), estimated construction noise contribution to the ambient sound environment at LT-02 (the nearest private residence) is generally expected to range from about 49 to 51 dBA L_{eq} over the course of project construction (see **Figure 3-13**). For short periods of time when construction activity occurs at or near the Project boundary closest to LT-02, the noise range would be higher by about 8 dBA (i.e., 57 to 59 dBA). This latter case would cause the ambient 58 dBA L_{dn} at LT-02 to rise to 60 dBA L_{dn}—an increase of only 2 dBA. Indoors (with windows closed), 35 to 40 dBA L_{dn} is expected during the day during the construction period. Since pre-Project outdoor ambient noise already exceeds the EPA guidance threshold of 55 dBA L_{dn}, and indoor L_{dn} is expected to remain below the 45 dBA threshold, temporary construction noise is expected to have a less than significant environmental effect.

4.9.2.1 Effects on Wildlife

Potential effects on wildlife species in the project vicinity would depend on their current level of habituation to man-made noise sources such as traffic noise and the presence and proximity of pre-project operating equipment (e.g., existing transmission lines) or human activity. The likelihood of effect, if any, would rise with decreasing distance to the project while it is under construction.

4.9.2.2 Construction Traffic

The estimated construction noise level range of 49 to 51 dBA L_{eq}, expected at the nearest residential receiver, already includes consideration for construction worker passenger vehicles arriving and departing the Project Site. Traffic from these vehicles and construction-related deliveries would also increase noise levels in proximity to the roads/routes on which they travel, but the increase would only be 3 dBA for every doubling of traffic relative to existing volumes (assuming the proportions of vehicle types and their speeds are unchanged) on the potentially affected roadways. Effects, if any, would also be temporary and cease upon completion of project construction.

4.9.2.3 Vibration

Given the distances between the nearest residential receivers and the project, ground vibration levels from project construction would be expected to attenuate to insignificant levels.

4.9.3 Operations Impacts

Using Cadna/A as a model for predicting the propagation of Project operation noise to the surrounding environment, the NVS describes that expected daytime operation noise from the Project at LT-02 will be less than 20 dBA L_{eq} and thus not a significant environmental effect (see **Figure 3-13**).

The Project involves fixed-tilt arrays of PV electricity generating panels that, by design, do not have actuators that might otherwise generate intermittent noise when operating to re-position panels for tracking the sun's path through the sky. Also, the PV panels will only require the washing of modules once per year, at most. Hence, for purposes of this analysis, typical daytime operational noise sources are likely limited to the following:

- Transformer/inverter equipment per 1 MWAC array (80.8 dBA Sound Power Level each, based on test data of an Advanced Energy Solaron 500K, as provided by the manufacturer);
- Substation transformer (83.4 dBA Sound Power Level, based on transformer noise estimation from Beranek & Ver, 1996); and,
- Building HVAC from the occupied Control and O&M buildings (90.1 dBA Sound Power Level).

Figure 3-13 depicts predicted iso-dBA contours (i.e., like contours on a topographical map showing locations having the same elevation, these show locations having the same sound pressure level) from Project operation. Note that this aggregate Project-only operation noise, up to about 30 dBA, generally stays within the Project boundary. For purposes of image clarity, SPL contours less than 30 dBA are not shown on **Figure 3-13**. Ambient sound level is not depicted in **Figure 3-13**.

The closest noise-sensitive receiver is LT02, which is expected to experience less than 20 dBA of Project operation noise. Since the measured ambient L_{dn} at LT02 is 58 dBA, the Project operation noise is not expected to cause an increase; therefore, due to the lack of ambient sound increase and its expected contribution to the ambient being far less than 55 dBA L_{dn}, Project operation noise should not create a significant environmental effect..

At night, the project would not be operating due to lack of adequate insolation. Nighttime operations would thus be limited to some reduced activity at the O&M and Control Buildings, such as security or maintenance, and therefore result in project nighttime operation noise levels that are less than those during the daytime and would also be considered insignificant in effect.

4.9.3.1 Effects on Wildlife

Potential effects on wildlife species in the project vicinity would depend on their current level of habituation to man-made noise sources such as traffic noise and the presence and proximity of pre-project operating equipment (e.g., existing transmission lines) or human activity. The likelihood of effect, if any, would rise with decreasing distance to the project and its operating noise sources.

4.9.3.2 Power Transmission

Noise from new operating power transmission equipment associated with the Project, including the conductors, is expected to be at a level that will not have a significant environmental effect.

4.9.3.3 Operations Traffic

The increase in traffic on existing roadways due to vehicles from project employees (i.e., those responsible for monitoring and maintaining operation on site) is expected to be very minor, and thus result in a less than significant effect.

4.9.3.4 Vibration

Given the distances between the nearest residential receivers and the project, ground vibration levels from project operation would be expected to attenuate to insignificant levels.

4.9.4 Cumulative Impacts

The project is not expected to result in significant cumulative effects related to noise during construction or operation. Thus, as no significant effects are anticipated from project construction or operational noise generation, significant cumulative effects are not expected. Construction noise is temporary and would conclude on completion of project construction. Although operation of the project would add some noise to the ambient sound environment, the magnitude is not considered significant and dissipates with increasing distance from the project boundary.

4.10 TRANSPORTATION

4.10.1 No Action

The No Action alternative would have no short- or long-term impacts to transportation within the study area.

4.10.2 Construction and Operation Impacts

The primary roads that would be used to access the site during both construction and post-construction operations would include SR 83, SR 146, SR 313, SR 340, and SR 821. SR 83 in Noble County, Ohio is designated as a Major Collector (rural). The existing average daily traffic (ADT) volume on SR 83 in the vicinity of the Project is 380 vehicles per day, of which approximately 10% are heavy vehicles. SR 83 is a two-lane roadway with a speed limit of 55 mph except for a short section in the Village of Cumberland (population 402) where the speed limit is 35 mph. In the unincorporated areas, the road consists of gently rolling terrain with an asphalt paved surface. The operational facility is not expected to cause or create any changes in traffic patterns; no new external roadways, intersections, upgrades or traffic signalization would be required.

SR 146 is designated as a Major Collector (rural) within the area. The two-lane roadway has a speed limit of 55 mph except for a short, one-half mile section east of SR 672 which is 45 mph. The road consists primarily of gently rolling terrain with an asphalt paved surface.

SR 313, a two-lane roadway classified as a Minor Collector (rural), has a speed limit of 55 mph except for a section in the Village of Derwent (population 2,915) where the speed limit is 45 mph. The road consists primarily of flat terrain with an asphalt paved surface.

SR 340 is designated as a Minor Collector (rural). The existing ADT on SR 340, between the site and SR 821, ranges from 640 to 1,300 vehicles per day, of which approximately 10% are heavy vehicles. SR 340 is a two-lane roadway with a speed limit of 55 mph except for a short section in the Village of Cumberland where the speed limit is 35 mph. In the unincorporated areas, the road consists of gently rolling terrain with an asphalt paved surface.

SR 821 is designated as a Major Collector (rural). The short stretch of SR 821 (approximately 0.7 mile) between SR 340 and I-77 has an ADT of 4,090 vehicles per day, of which 5% are heavy vehicles. SR 821 has a speed limit of 55 mph for a short distance before changing to 35 mph through the Village of Belle Valley (population 263). Primarily, the road consists of flat terrain and asphalt paved surfaces. On all of these state routes, the only concentration of homes or businesses falls with the limits of the two villages.

The primary route for workers and equipment would be to and from I-77; vehicles from the south would travel I-77 to SR 821 to SR 340 to SR 83, while those from the north would exit I-77 at SR 313 to SR 821 to SR 146 to SR 83. Based on the existing ADT volumes, it is estimated that SR 83 and SR 146 both operate at a level of service (LOS) B during the peak hours of a typical day. It is estimated that SR 313, SR 340 and SR 821 operate at a LOS C during the peak hours. The efficiency of a roadway segment is measured by the LOS, which quantifies the delay that a

motorist experiences as they travel the roadway segment. LOS is expressed by the letters A, B, C, D, E and F. LOS "A" represents the best operation with minimal vehicle delay (e.g., free-flow traffic) and LOS "F" represents the worst operation with excessive vehicle delay (e.g., stopped, bumper-to-bumper traffic).

The construction of the facility has been assumed to last no more than 12 months for each phase. During that time, the number of workers and construction vehicles, including deliveries, would fluctuate. It is estimated that during the busiest time of the facility construction, there would be approximately 100 vehicles traveling to and from the site per day. Assuming all of these trips occur during the peak hours, it is anticipated that SR 83 and SR 146 would continue to operate at a LOS B, and SR 313, SR 340 and SR 821 would continue to operate at a LOS C. The typical two-lane road can handle much greater volumes than what is expected to be on the road during construction. The small increase in traffic due to construction is expected to have a minimal, if any, impact on the surrounding roadway network.

Once the facility is open and operational, it is anticipated that the facility would be monitored remotely with up to six existing full time AEP Ohio employees who would be driving there on a weekly basis to monitor and maintain the equipment. This increase in traffic would have a negligible impact on the surrounding roadway network.

4.10.3 Cumulative Impacts

As described above, the proposed electric facilities included with this Project would have only minimal temporary effects on transportation within the Project area and, as result, would not have any cumulative effects on transportation.

5.0 MITIGATION MEASURES

As described in the previous section (**Section 4.0**), TPS would implement numerous mitigation measures to aid in minimizing the potential environmental impacts arising from the construction and operation of the Project. The following list provides a summary of the mitigation measures that TPS would implement:

- Revegetate disturbed areas with native grasses and other native herbaceous vegetation to minimize the grassland habitat disturbance.

- Use proper erosion control measures for all areas with soil disturbance; complete construction in compliance with the NPDES Permit for Storm Water Discharges from Construction Activities issued by the State of Ohio; develop, implement, and maintain BMPs included in the Stormwater Pollution Prevention Plan.

- Use silt fences or berms to prevent siltation of water bodies near waterways and wetlands.

- Promptly stabilize disturbed areas after construction has been completed with grasses or mulch.

- Use topsoil removed during construction as fill or spread over the non-paved areas after construction is completed.

- Obtain all necessary construction permits from the appropriate federal, state, and local governments prior to construction.

- The functions and values of the impacted aquatic systems will be replaced via mitigation agreed to by USACE and OEPA through the Clean Water Act Section 404 permit process (USACE) and the Ohio Isolated Wetland permit process (OEPA). This mitigation plan will become part of the respective permit applications that will be submitted to these agencies.

- All herbicides, where required, will be applied in accordance with applicable federal and state regulations.

- Some tree-cutting will be required to clear the new transmission line corridor. This cutting will occur between September 30 and April 1 to preclude any potential impact to Indiana bat habitat.

- To protect Northern harrier habitat, new grading of undisturbed grassland will not occur during the species' nesting period of May 15 to August 1.

- Once delivery vehicles are on-site, they will travel on designated routes that will be watered by truck regularly throughout each day to minimize the creation of dust.

- During earth moving operations, water trucks will be used to minimize dust creation and assist with compaction of materials on the project site. Material stock piles will be watered down to avoid fugitive dust.

- Once major earth operations are complete, a single water truck working full time will be able to keep control of the dust generated by the project.

- A vehicle tracking area consisting of large rock or steel plates which is designed to shake mud and loose materials from construction vehicle will be installed at the exits from the project site. Roadway watering and cleaning will only be done in the event that material begins to collect on the roadway following a major storm event and the tracking area is not performing properly.

- Discrete areas will be graded and prepared for installation of the solar panels. Equipment will move from one solar area to another to begin grading to prepare the next area for installation of the solar panels. This method both reduces the amount of disturbed area at any one time and reduces the amount of construction equipment needed to perform the work. The reduction of disturbed area at any one time, along with the use of water trucks, will help to minimize dust emissions from the Project Site.

- After construction is complete, disturbed areas will be re-vegetated to control fugitive dust generation. Vehicles and other fuel-combusting equipment (e.g. riding lawnmower) necessary for onsite groundskeeping or maintenance shall be regularly maintained and operated according to manufacturer's recommendations. Reduced vehicle speed will be enforced to minimize fugitive dust from vehicle travel onsite. Any equipment permitted by the Ohio EPA shall operate according to specific permit conditions and/or applicable rules appropriate for that equipment type.

- Should any previously unknown historic/prehistoric sites or artifacts be encountered during construction, all land altering activities within a 100 foot radius of that location will be suspended until such time that RUS and the OHPO is notified and appropriate measures taken to assure compliance with the National Historic Preservation Act and associated state legislation.

- Where appropriate, the Project Site stormwater drainage system will be designed using natural channel design, to be used as part of the stream mitigation for Project stream impacts. In addition, enhancement opportunities will be sought of onsite streams that remain undisturbed, also as partial mitigation for Project stream impacts.

- Where appropriate, onsite wetland mitigation opportunities will be sought as partial mitigation for Project wetland impacts.

6.0 PUBLIC AND AGENCY COORDINATION

This section describes the consultation and coordination RUS and TPS have had with the public, public officials, and government agencies during the preparation of the EA. This section will detail the steps taken to inform these groups of the Project, summarize the comments received, and outline further coordination and consultation with the public and these organizations.

6.1 Scoping Process

The Council on Environmental Quality's regulations for implementing the National Environmental Policy Act (NEPA) define "Scoping" as "an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action." CEQ's NEPA regulations address the need for scoping for projects requiring an Environmental Impact Statement. RUS regulations (7 CFR 1794) also require the use of a scoping procedure for certain proposed actions in the development of an EA.

RUS and TPS initiated scoping through a number of channels including newspaper notices; mailings to public officials and responsible agencies; and a public scoping meeting.

RUS held a public scoping meeting, using an open house format, at the Caldwell Elementary School, 44350 Fairground Road, Caldwell, Ohio 43724. The public scoping meeting was held between 5:00 p.m. and 9:00 p.m. on July 14, 2011. The purpose of the meeting was to provide information regarding the Project to the public and to solicit comments from the public for the preparation of the EA. The public was notified of the meeting through a June 27, 2011, Federal Register notice placed by the RUS, as well as a series of notices placed by TPS in the following newspapers:

- Cambridge Daily Jeffersonian, published on June 27, 2011
- Zanesville Times-Recorder, published on June 28, 2011
- Caldwell Journal-Leader, published on July 5, 2011

The Federal Register notice and newspaper advertisements and legal notices informed the public that comments for the Project should be received by August 15, 2011 to ensure they are considered in the EA.

Representatives from RUS and TPS were present to greet the public and direct them through different stations at the scoping meeting. The stations TPS made available were Project Area, Project Highlights, Site Selection Criteria, Permitting/Environmental Review Process and Visual Simulation.

A total of 16 people attended the public scoping meeting. RUS received six agency comments and five public comments. Copies of the comments letters and more information about the meetings can be viewed in the *Turning Point Solar Project Scoping Report* (RUS, 2011).

6.2 Additional Public Involvement

This EA will be made available to the public for a 30-day public review and comment period. Availability of the document for review and comment will be noticed in the Federal Register and local newspapers. All comments from reviewers should be addressed to:

Ms. Lauren McGee
Environmental Scientist
USDA, Rural Utilities Service
Engineering and Environmental Staff
1400 Independence Ave. SW
Mail Stop 1571, Room 2244-S
Washington, DC 20250-1571

Once RUS has reviewed and evaluated comments, it will issue its environmental decision related to the Project. Should RUS choose to issue a Finding of No Significant Impact (FONSI) for the Project, a Federal Register notice will be published in addition to newspaper notices informing the public of the RUS finding and the availability of the EA and FONSI. The notice shall be prepared in accordance with RUS guidance.

Pursuant to 36 CFR § 800.2(d)(3), the RUS is using its NEPA procedures (7 CFR Part 1794) to meet its responsibilities to solicit and consider the views of the public during review under Section 106 of the National Historic Preservation Act and its implementing regulation (36 CFR Part 800). Accordingly, public comments submitted during NEPA scoping have informed RUS decision-making in Section 106 review. RUS has determined that the Project would have no effects to historic properties (see **Appendix C**).

6.3 Future Public and Agency Involvement

Copies of the EA are available for public review at RUS, 1400 Independence Avenue, SW., Washington, DC 20250–1571; at the RUS's Web site, http://www.rurdev.usda.gov/UWP-ea.htm; and at the Caldwell Public Library, 517 Spruce Street, Caldwell, Ohio 43724.

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