3.0 AFFECTED ENVIRONMENT

This section provides a description of the existing natural and human environment in the Project Area, which includes the proposed solar facility site (Project Site) and the transmission line corridor. **Section 4.0** discusses the potential environmental impacts of the Project, including the proposed facility site and transmission line corridor.

The Project Area is located in the unglaciated Allegheny Plateau ecoregions (Waters and Roth, 1990). The Plateau in this region consists of steep hills, ridges, and many intervening valleys. The Project Area exhibits rolling topography with elevations ranging from approximately 900 feet above mean sea level (AMSL) to approximately 1,100 feet AMSL.

A high ridge in the eastern portion of the Project Area serves as the divide between drainage to the Muskingum River towards the north and west and to the Ohio River to the southeast. The majority of the site is drained by Rannells Creek, which flows northward along the western margin of the Project Area. This drainage eventually flows into the Muskingum River. A small area in the southeast portion of the site drains to Coal Run. This drainage eventually makes its way into the Ohio River.

3.1 LAND USE

Based on historical records, the Project Area was undeveloped from at least 1911 through approximately 1960. Portions of the Project Area were used for strip mining operations from the 1960s through the late 1980s, at which time the strip mined land was reclaimed by the Ohio Coal Company. Since the early 1990s, the Project Area has been used for recreation and the grazing of livestock. Surrounding areas have been woodlands, vacant land, or developed for mining uses since at least 1960. At present time, a few oil & gas production facilities (wells, pumps and storage tanks) are scattered across the Project Site.

3.2 GEOLOGY, TOPOGRAPHY and SOILS

According to the Physiographic Regions of Ohio Map (ODNR 2000), the Project Area is located in the Marietta Plateau physiographic region. The region consists of dissected, high-relief plateaus. Elevations in the region range from approximately 515 to 1,400 above msl. However, elevations within the Project Area range from 900 to 1,100 feet AMSL. Fine-grained rocks, red shales, and red soils are common. Bedrock underlying the region consists of Pennsylvanian-age Upper Conemaugh Group through Permian-age Dunkard Group cyclic sequences of red and gray shales, and siltstones, sandstones, limestones, and coals.

The 771-acre Project Site was formerly used for strip mining up until the 1980s. Once mining ceased, grading associated with reclamation efforts resulted in gently rolling terrain with open grass fields and ponds. The ponds were intended as a way to mitigate soil erosion potential, especially after grass seeding took place. The rolling terrain ranges in elevation from 990 feet to 1,100 feet above mean sea level, with slopes ranging from approximately 1 to 20 percent. Noble County is one of 29 counties in southeastern Ohio that are part of the Appalachia geographic region (Ohio History Central 2005).

According to the Soil Survey of Noble County, Ohio (Waters and Roth, 1990), the Project Area is underlain with soil classified as Morristown Silty Clay Loam Complex and Udorthents, Pits Complex. The Morristown series consists of very deep, well drained soils with moderately slow permeability formed in calcareous regolith from surface mine operations. The regolith is a mixture of partially weathered fine earth and fragments of bedrock. Coarse fragments are mostly limestone and shale with some medium-grained sandstone and siltstone. Udorthents consist of nearly level and gently sloping areas where the original soils have been cut away or covered with a fill material. Permeability is slow to moderate.

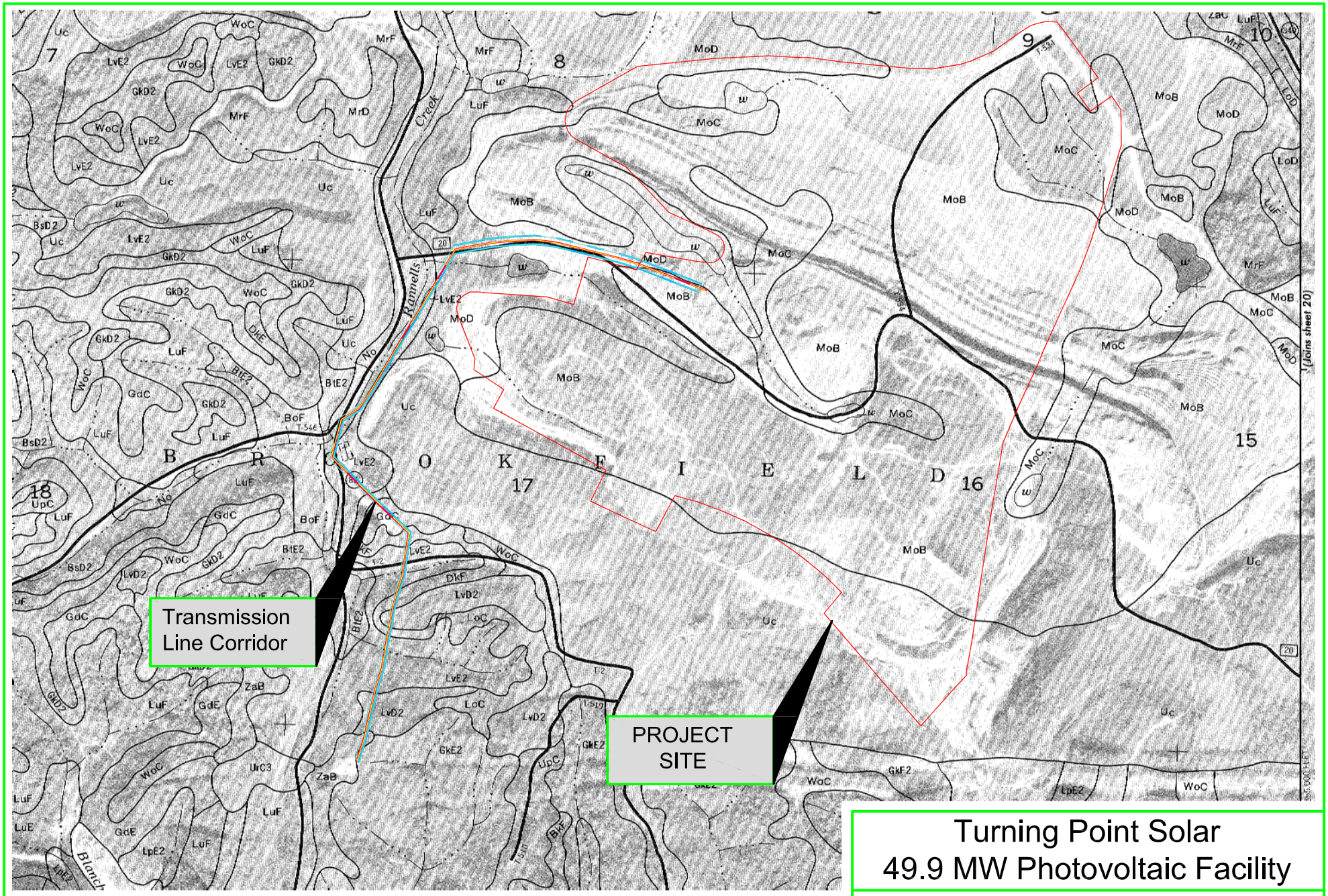
According to the National Resources Conservation Service's (NRCS) Web Soil Survey (USDA-NCSS, 2011), the Project Area is underlain by 11 unique soil units as illustrated in **Figure 3.1** and **Table 3-1**. None of the soil units are listed as hydric on the National Hydric Soils List (NRCS, 2011b).

Table 3-1. Project Area Soil Types, Drainage, and Hydric Status.

Soil Unit	Drainage Class	Hydric Status[1]
Dekalb channery loam, 40 to 70 percent slopes (DkF)	well drained	Non-Hydric
Gilpin silt loam, 8 to 15 percent slopes (GdC)	well drained	Non-Hydric
Lowell-Gilpin silt loams, 35 to 70 percent slopes (LuF)	well drained	Non-Hydric
Lowell-Upshur silty clay loams, 15 to 25 percent slopes, eroded (LvD2)	well drained	Non-Hydric
Lowell-Upshur silty clay loams, 25 to 40 percent slopes, eroded (LvE2)	well drained	Non-Hydric
Morristown silty clay loam, 0 to 8 percent slopes (MoB)	well drained	Non-Hydric
Morristown silty clay loam, 8 to 15 percent slopes (MoC)	well drained	Non-Hydric
Morristown silty clay loam, 15 to 25 percent slopes (MoD)	well drained	Non-Hydric
Nolin silt loam, frequently flooded (No)	well drained	Non-Hydric
Udorthents-Pits complex (Uc)	N/A	Non-Hydric
Zanesville silt loam, 1 to 6 percent slopes (ZaB)	moderately well drained/well drained	Non-Hydric

[1]Natural Resources Conservation Service, 2000, 2004

The NRCS Web Soil Survey was accessed online in order to identify prime and other important farmland soils in the Project Area (USDA-NCSS, 2011). In addition, a paper copy of the Soil Survey of Noble County, Ohio (Waters and Roth, 1990) was examined concerning farmland soils. The NRCS defines prime farmland soils in the Farmland Protection Act (7 CFR 658.2) as soils with an adequate and dependable source of water, favorable temperatures and growing season, acceptable acidity/alkalinity level, few or no rocks, sufficient permeability for water and air, and slopes averaging zero to six percent. None of the soil types in the Project Area are classified as prime farmland soils. This was confirmed by submitting a Form AD-1006 to the local NRCS office in Cambridge, Ohio. The NRCS response confirmed that no prime, unique, or important farmland soil units occur in the Project Area (**Appendix A**).



0 1500'

1" = 1500'

Source: Soil Survey of Noble County, Ohio 1990

Turning Point Solar 49.9 MW Photovoltaic Facility

Figure 3.1. Project Area on Soil Survey Map

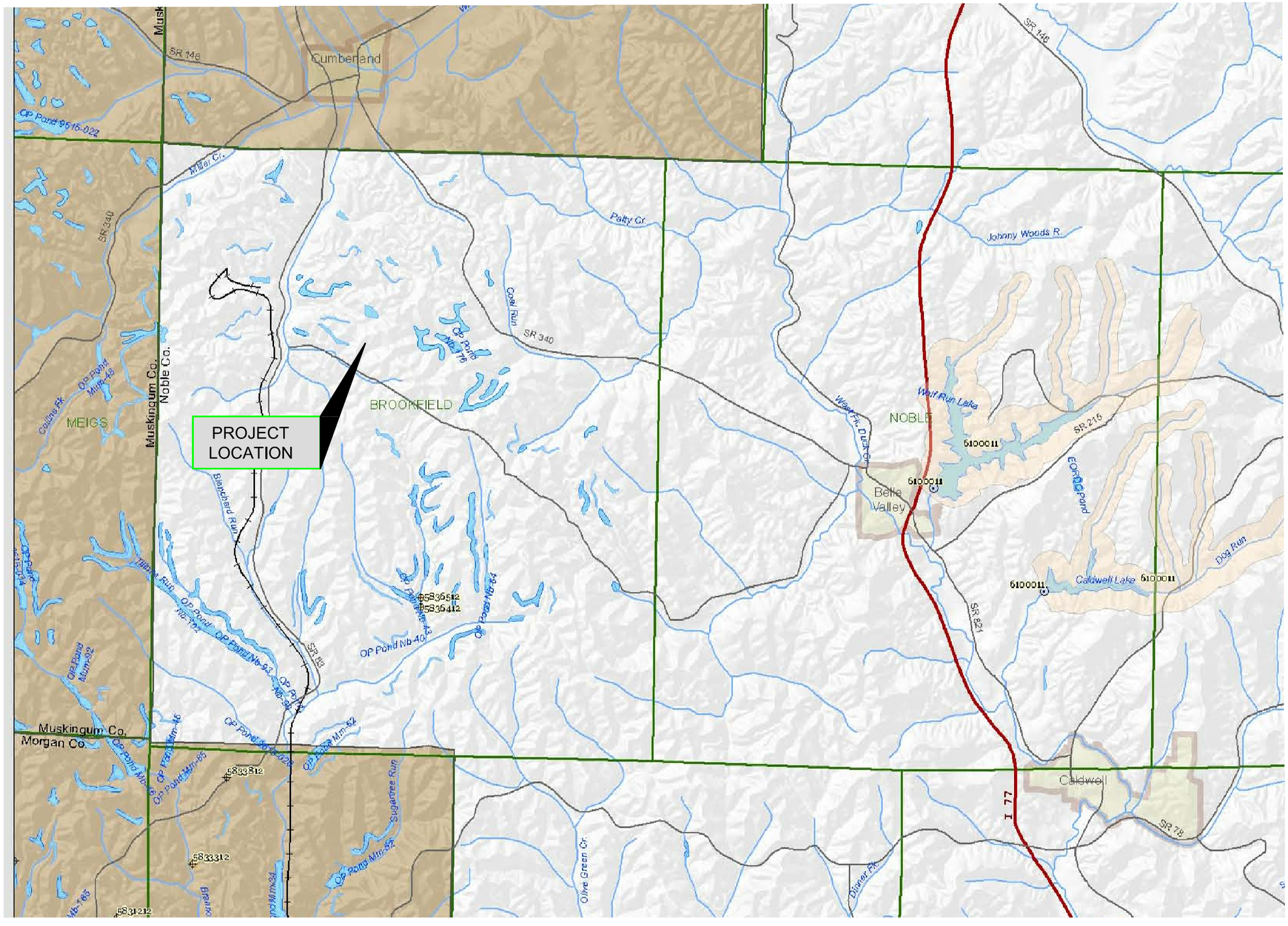
URS

3.3 WATER RESOURCES

Ohio Environmental Protection Agency's (OEPA) Source Water Assessment and Protection (SWAP) mapping was reviewed. No sole source aquifers or drinking water source protection areas for community, non-community, or residential wells are located within the Project Area (**Figure 3-2**). Streams and former strip mine ponds provide an abundance of surface water in the area. Rannells Creek flows along the west side of the Project Area.

3.3.1 Wetlands, Streams and Ponds

Wetlands are defined by the U.S. Army Corps of Engineers (USACE) as "areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (Environmental Laboratory 1987). This definition of a wetland is for regulatory purposes, of which the USACE has jurisdiction through Section 404 of the Clean Water Act. In order to be classified as a wetland, an area must meet three criteria; hydrophytic vegetation, hydric soils, and wetland hydrology. Hydrophytic vegetation has the ability to grow and efficiently compete under anaerobic conditions (the soil is essentially void of oxygen). Hydric soils are created under long-term inundation or saturation of a site, which causes the removal of oxygen from the soil profile and the eventual production of reducing conditions. Wetland hydrology is present if an area is inundated permanently or temporarily for a sufficient period during the growing season. In addition to wetlands under the jurisdiction of the USACE, the State of Ohio may regulate certain wetland areas within the Project Area.



LEGEND

Protection Zone, System Type

- Inner Zone, Community
- Outer Zone, Community
- Inner Zone, Nontransient Noncommunity
- Outer Zone, Non-Transient Noncommunity
- Inner Zone, Transient Noncommunity
- Outer Zone, Transient Noncommunity
- Corridor Management Zone, Surface Water
- Critical Assessment Zone, Lake Erie

- Public Water System Intake
- Sole Source Aquifer
- Municipal Area
- Township
- County
- Stream
- Limited Access Highway
- Other Highway
- Other Road
- Railroad

0 1 mile
SCALE 1" = 1 mile

From: Drinking Water Source Protection Areas, and Public Water System Wells and Intakes
https://swap.epa.state.oh.us/swap_assessments.html
Date: June 25, 2010

Turning Point Solar
49.9 MW Photovoltaic Facility

Figure 3-2. Project Location on OEPA Drinking Water Map

URS

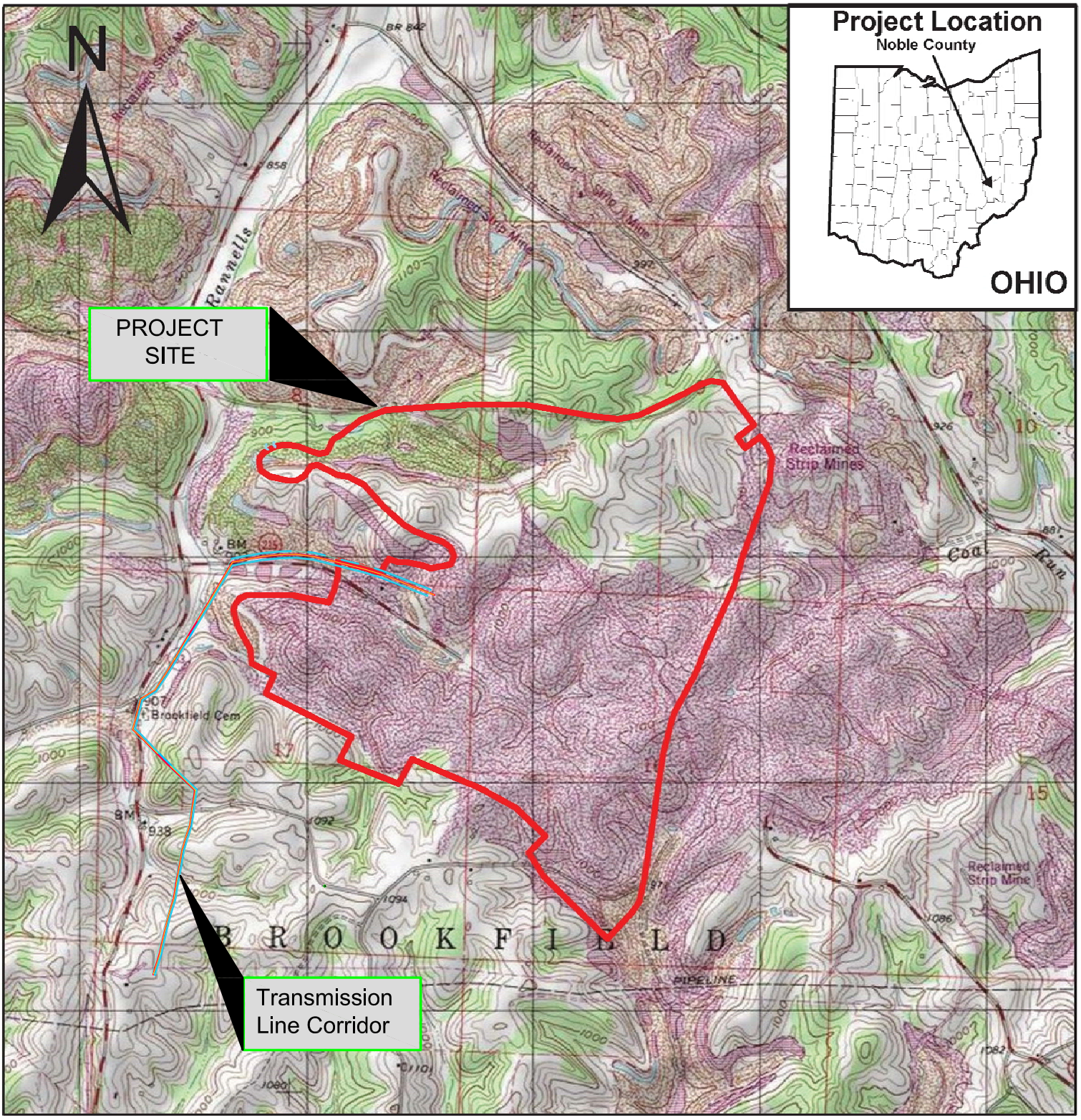
Wetlands within the Project Area were identified and their boundaries determined using the procedures outlined in the Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region (Interim Regional Supplement) (USACE 2010). Initially, potential wetlands were identified by examining topographic (**Figure 3-3**), soils (**Figure 3-1**), and National Wetlands Inventory (**Figure 3-4**) maps.

Wetland delineation field investigations were conducted in February and March of 2011 using methods described in the Interim Regional Supplement. Following these methods, plant communities were characterized according to their soils, signs of hydrology, and dominant vegetation. Areas that exhibited hydric soils, wetland hydrology, and a dominance of hydrophytic vegetation were considered to be a wetland.

The Project Area was also screened for the presence of areas that meet the criteria for "other waters of the U.S." These areas consist of ephemeral, intermittent, and perennial streams, as well as open water habitats such as ponds. Site drainage was determined by secondary source information (i.e., topographic mapping and aerial photos) and in the field using current regulatory guidance. Drainage channels that exhibited "bed and bank" and an ordinary high water mark in the channel were identified and delineated as being potentially jurisdictional streams.

3.3.1.1 Jurisdiction

The Clean Water Act (U.S. Congress, 1972, amended 1977) makes it unlawful to discharge dredged or fill materials into "navigable waters" without a permit (33 U.S.C. S1311(a)). "Navigable waters" are defined as "the waters of the United States, including the territorial seas." The U.S. Army Corps of Engineers (Corps), which issues permits for discharge of dredged material or fill into navigable waters, interprets "waters of the United States" to include not only traditionally navigable waters, but tributaries of such waters and wetlands "adjacent" to such waters and tributaries. "Adjacent" is defined as wetlands "bordering, contiguous [to] or neighboring" waters of the United States even when they are "separated from [such] waters…by man-made dikes…and the like." Originally, the Corps maintained jurisdiction of wetlands isolated from waters of the U.S. by means of the "Migratory Bird Rule." The Migratory Bird Rule stated that wetlands are a key resource for waterfowl, which continuously migrate between states. The waterfowl being a vital resource, impacts to wetlands were considered to affect interstate trade and thus be under the purview of federal regulation. A U.S. Supreme Court ruling [Solid Waste Authority of Northern Cook County (SWANCC) v. The United States Army Corps of Engineers, 2001] determined that migratory waterfowl were not sufficient cause alone to subject isolated wetlands to regulations pursuant to Section 404 of the Clean Water Act. Subsequently, a bill was signed into law by then-Governor Taft (Ohio House Bill 231) giving the Ohio EPA authority to regulate and permit impacts to isolated wetlands. Therefore, in an attempt to establish the level of jurisdictional authority, the hydrology of each wetland within the Project Area was evaluated to define whether or not individual wetlands should be considered adjacent or isolated.



Basemap: Cumberland, OH 1994 USGS 7.5' Topographic Quadrangle

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

Figure 3-3 Project Area Location Map

URS

U.S. Fish and Wildlife Service

National Wetlands Inventory

May 17, 2011

Wetlands

- Freshwater Emergent
- Freshwater Forested/Shrub
- Estuarine and Marine Deepwater
- Estuarine and Marine
- Freshwater Pond
- Lake
- Riverine
- Other

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

User Remarks:

Figure 3-4 - NWI Map

In June of 2006, the United States Supreme Court ruled on a case (Rapanos et ux. v. United States) challenging the Corps jurisdiction over several wetlands that drain via man-made ditches into navigable waters. In a split decision, the case was returned to the U.S. 6th Circuit Court of Appeals. The opinion of note on this case was written by Justice Kennedy, who did not agree completely with either the three judge plurality or the three judge dissent. He concluded that a water or wetland is subject to regulations pursuant to Section 404 of the Clean Water Act if it possesses a "significant nexus" to waters that are navigable or could reasonably be so made. He directed the Corps to better define "a significant nexus" to establish the framework for inquiry.

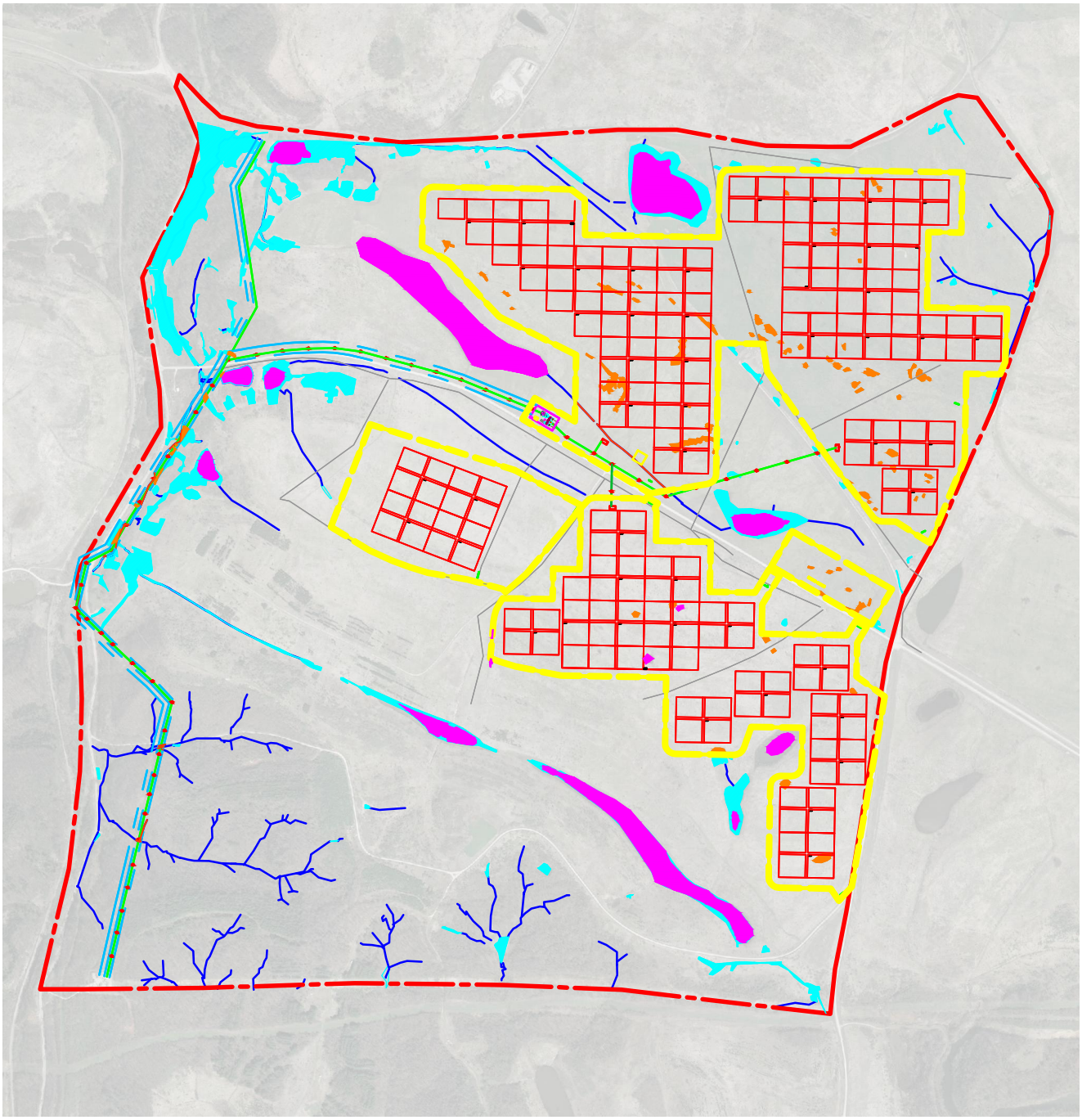
The rationale for the Corps jurisdiction over wetlands under the Clean Water Act is that wetlands perform critical functions for physical and chemical integrity of waterways such as pollutant trapping, flood control, and runoff storage. In contrast, when wetland impacts on navigable waters are insubstantial, jurisdiction cannot be awarded based on the Clean Water Act. Further guidance was issued by the Corps in June of 2007.

3.3.1.2 Wetland/Stream Delineation Results

According to the U.S. Fish & Wildlife Service (USFWS) National Wetland Inventory (NWI) online wetland mapper, several wetlands are located throughout the Project Area. The NWI data that covers the vicinity of the Project Area is included as **Figure 3-4**. One wetland designated as PEMYx/POWYx (palustrine, emergent/open water, saturated/semi-permanent/seasonal, excavated) is illustrated in the southeast portion of the Project Area. The remaining wetlands are designated as POWZx (palustrine, open water, intermittently exposed/permanent, excavated).

URS conducted a wetlands and water resources delineation at the Project Area in February and March 2011. A total of 139 wetlands were delineated within the Project Area. Of this, 108 wetlands were delineated within the boundaries of the Project Site shown in **Figures 3-3** and **3-4**. An additional 31 wetlands were delineated in the vicinity of the transmission line corridor shown in **Figure 3-5**. Most of the delineated wetlands are located either wholly or partially within areas that are actively or recently used by grazing cattle. All wetlands that were delineated within the boundaries of the Project Area are generally described below in terms of location, jurisdictional status, and quality as dictated by the Ohio Rapid Assessment Method (ORAM) v5.0, which is the Ohio Environmental Protection Agency's (OEPA) method for assessing wetland quality. Many of the direct hydrologic connections were discerned after conducting the field investigation by examining mapping provided in the *Soil Survey* as well as available aerial photography. Any wetlands preliminarily deemed isolated and/or not subject to regulations pursuant to Section 404 of the Clean Water Act are described as such below. The cover type descriptions identify the dominant species in each habitat type by common name, with the scientific name following in parentheses. The locations and extents of the delineated wetlands and streams are presented in **Figure 3-5**.

The Wetland Delineation Report (see **Appendix B-1**) was submitted to the US Army Corps of Engineers (USACE) on June 16, 2011. A site visit with USACE was conducted on July 26, 2011. A Jurisdictional Determination letter from USACE, verifying the wetlands as delineated, is expected in early 2012.



LEGEND

- Wetland
- Impacted Wetland
- Pond
- Stream
- Impacted 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 3-5.
Wetland and Waters Map

In Ohio, the OEPA has adopted regulations which categorize wetlands based on their quality and impose differing levels of protection based on the wetland's category (OAC rules 3745-1-50 through 3745-1-54). The regulations specify three wetland categories: Category 1, Category 2, and Category 3 wetlands. These categories correspond to wetlands of low, medium and high "quality." Wetlands are preliminarily placed in these categories based on the ORAM results. Categorization is confirmed or adjusted by OEPA.

The vast majority of wetlands delineated at the project site were preliminarily categorized as Category 1 based on the ORAM results, so further discussion of this Category is appropriate. Ohio Administrative Code Rule 3745-1-54(C)(1) defines Category 1 wetlands as wetlands which "...support minimal wildlife habitat, and minimal hydrological and recreational functions," and as wetlands which "...do not provide critical habitat for threatened or endangered species or contain rare, threatened or endangered species." In addition, Category 1 wetlands are often hydrologically isolated and have some or all of the following characteristics: low species diversity, no significant habitat or wildlife use, limited potential to achieve beneficial wetland functions, and/or a predominance of non-native species.

Examples given in the rule of Category 1 wetlands are those that developed on excavated or mined lands or wetlands that are isolated from other surface waters and that are dominated by invasive plant species like narrow-leaf cattail (*Typha angustifolia*), purple loosestrife (*Lythrum salicaria*), reed canary grass (*Phalaris arundinacea*), European buckthorn (*Rhamnus frangula*), or giant reed (*Phragmites australis*). In other instances, Category 1 wetlands may be wetlands which were seriously degraded by human-caused disturbances such that the wetland's species diversity and functionality has been significantly compromised. Category 1 wetlands are often isolated emergent marshes dominated by cattails with little or no upland buffers located in active agricultural fields. Category 1 forested, depressional wetlands are less common, if only because these often had the trees removed at some time in the past, and therefore, by definition, are no longer "forested." However, Category 1 forested systems do exist. Typically, they have been disturbed by grazing activities, stormwater inputs, or other hydrologic modifications. A confounding factor for forested wetlands is that the canopy may be relatively mature and diverse because of the long-lived nature of most tree species. Such wetlands often have a "reasonable potential for restoration" such that they will be Category 2 wetlands.

Category 1 wetlands are further defined as "limited quality waters" in OAC Rule 3745-1-05(A). They are considered to be a resource that has been so degraded, has such limited potential for restoration, or is of such low functionality that little to no social or economic justification exists to restore them, and therefore, lower standards for avoidance, minimization, and mitigation are applied.

Unofficial transitional zones exist between the main categories such as "Category One or Category Two Gray Zone," and "Modified Category Two." However, for regulatory purposes, wetlands within these transitional zones are considered to be the higher main category unless a compelling argument can be made to the contrary.

Of the 108 wetlands delineated within the main Project Site, 89 were preliminarily deemed as isolated and do not possess a significant nexus to a relatively permanent waterway (i.e. perennial

stream) or traditionally navigable waterway (e.g., the Ohio River). Of the 31 wetlands delineated within the transmission line corridor, 9 were deemed as isolated. These wetlands are solely under the jurisdiction of the OEPA and are subject to the Ohio Isolated Wetlands Laws. The remaining 19 wetlands of the Project Site and 22 wetlands of the transmission line corridor are 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. These wetlands were potentially deemed to be "waters of the U.S." and, if confirmed by the U.S. Corps, are subject to regulations pursuant to Section 404/401 of the Clean Water Act. However, as mentioned above, the U.S. Army Corps of Engineers makes the final determination as to the jurisdiction of a wetland, stream, or other water. **Table 3-2** below summarizes the number and type of wetlands in the Project Area.

Table 3-2. Number of Wetlands in Project Area and Jurisdiction

	Isolated (jurisdiction under OEPA)	Potential Waters of the U.S. (U.S. Corps)	Total Number of Wetlands
Project Site	89	19	108
Transmission Corridor	9	22	31
Project Area	98	41	139

Eighty eight of the 89 isolated wetlands located within the main Project Area are shallow depressions that were inundated during the field investigation. Dominant vegetation of these 88 wetlands included either soft rush (*Juncus effusus*), strawcolored flatsedge (*Cyperus strigosus*), woolgrass (*Scirpus cyperinus*), or reed canary grass. Although some other emergent vegetation was present for some of the isolated wetlands located in the grazing portions of the Project Area, at least one of these three species was dominant in each of these wetlands. Based on the ORAM scores for these 88 wetlands, all are categorized as "Category One", which is typically indicative of low quality wetlands. Each of these wetlands has undergone considerable substrate disturbance, habitat alteration, and modifications to the natural hydrologic regime due to recent grazing and historic strip mining activities. These 89 wetlands total approximately 6.4 acres.

One of the 89 isolated wetlands located within this portion of the Project Area is associated with the edge of a pond. Dominant vegetation of this wetland (Wetland A) included eastern cotton-wood (*Populus deltoides*) and sandbar willow (*Salix interior*) in addition to strawcolored flatsedge. Based on the ORAM score, Wetland A was categorized as scoring within the "Category One or Category Two Gray Zone," which indicates a slightly higher quality. This wetland has also undergone considerable disturbance due to recent grazing and historic strip mining activities. However, Wetland A exhibits horizontal interspersion due to multiple cover types such as an herbaceous layer, a shrub layer, and open water which accounts for the slightly higher ORAM score when compared to the other 88 isolated wetlands. Wetland A is approximately 1.36 acres which does not account for the 0.2 acres of open water. The 108 wetlands in the Project Site total approximately 13.9 acres.

The thirty-one wetlands in the vicinity of the transmission corridor exhibit slightly more diversity than those in the Project Site. Twenty-two of the 31 are considered jurisdictional

wetlands, while nine are considered isolated. Twenty-nine are dominated by emergent vegetation similar to the Project Site wetlands, while two are dominated by scrub-shrub vegetation, such as green ash (*Fraxinus pennsylvanica*) and sandbar willow. Based on the ORAM scores for these 31 wetlands, 22 are categorized "Category One," two are considered "Category One/Two Gray Zone," and seven are considered Modified Category Two. These 31 wetlands total approximately 27.4 acres.

One perennial stream, twelve intermittent streams, and eight ephemeral streams are located within the boundaries of the Project Site. Four perennial streams and six intermittent streams are located within the boundaries of the transmission line corridor. **Table 3-3** summarizes the number and characteristics of streams in the Project Area.

Table 3-3. Number/Characteristics of Streams in/near Project Area

	Perennial	Intermittent	Ephemeral	Total Number of Streams
Project Site	1	12	8	21
Transmission Corridor	4	6	0	10
Project Area	5	18	8	31

Nineteen wetlands are hydrologically continuous with these streams, and, of these, nine are linear and are along the floodplain of each respective stream. Dominant vegetation of these wetlands includes either, soft rush, strawcolored flatsedge, woolgrass, or reed canary grass. These wetlands are located entirely within the Project Area with the exception of one wetland which extends off-site. These wetlands total 0.9 acres on-site. Eight of the nineteen wetlands associated with streams are non-linear depressions hydrologically continuous with the floodplain of each respective stream. Dominant vegetation of these wetlands includes either narrow-leaf cattail, soft rush, strawcolored flatsedge, woolgrass, or reed canary grass. These wetlands are located entirely within the Project Area with the exception of one wetland which extends off-site. These wetlands total 0.3-acres on-site. Lastly, two of the nineteen wetlands hydrologically continuous with streams are associated with ponds that discharge into streams. Dominant vegetation of these wetlands consists of sandbar willow and reed canary grass. These wetlands total 5.0 acres, which does not account for the 8.4 acres of open water associated with these wetlands. In addition to the streams located on-site, 14.7 acres within the Project Area would be considered "waters of the U.S."; this includes 6.2 acres of wetlands and 8.4 acres of open water.

Based on the ORAM scores for these nineteen wetlands, all but two are categorized as "Category One" which is typically indicative of low quality wetlands. Each of these wetlands has undergone considerable substrate disturbance, habitat alteration, and modification to the natural hydrologic regime due to recent grazing and historic strip mining activities. One wetland was categorized as scoring within the "Category One or Category Two Gray Zone," and one wetland was categorized as a "Modified Category Two" wetland. These wetlands have also undergone considerable disturbance due to recent grazing and historic strip mining activities, although the Modified Category Two Wetland exhibits some horizontal interspersion due to multiple cover types such as an herbaceous layer, a shrub layer, and open water. The Category One or Category Two Gray Zone wetland is part of a larger wetland complex located mostly off-site that exhibited multiple covertypes and various hydrologic regimes thus accounting for the higher ORAM scores.

The Wetland Delineation Report for the Project was submitted to the Huntington District of USACE on June 16, 2011. URS and USACE personnel participated in a field visit on July 26, 2011, where USACE requested additional information. The Wetland Delineation Report for the Project was submitted to OEPA on August 4, 2011. The requested additional information was provided to USACE on August 9, 2011. The Wetland Delineation Report for the Project can be seen in **Appendix B-1**.

In summary, a total of 139 wetlands and 31 streams were delineated in the Project Area. Of the wetlands, the majority (98) were considered isolated, while the remaining 41 were considered jurisdictional. One hundred twenty-seven of the delineated wetlands were considered Category One, four are considered "Category One/Two Gray Zone," and eight are considered Modified Category Two. Altogether these wetlands comprise 41.4 acres. Of the 31 streams delineated in the Project Area, five were considered perennial, 18 intermittent, and eight ephemeral.

3.3.2 Floodplain

A review of the Flood Insurance Rate Map developed by the Federal Emergency Management Agency (FEMA) revealed that none of the Project Area is located in a Special Flood Hazard Area or within a 100-year floodplain (**Figure 3-6**).

3.4 BIOLOGICAL RESOURCES

The following sections describe the general vegetation and wildlife in or near the Project Area, and also include a discussion of threatened and endangered species that are potentially present.

3.4.1 Vegetation and Wildlife

As discussed above in **Section 2.4.2.5**, since 1972, the reclaimed strip mine areas have been sown with a seed mix of herbaceous vegetation, which not only protects the soil from erosion but has also been instrumental in restoring the land for useful purposes (AEP, 2011a). Most often, this has been a mixture of yellow sweet clover (*Melilotus officinalis*), red clover (*Trifolium pratense*), orchard grass (*Dactylis glomerata*), and tall fescue (*Festuca arundinacea*). Current vegetation within the Project Area includes both upland and wetland species. Dominant wetland vegetation is discussed above in **Section 3.3.1.2**.

Dominant upland vegetation includes the original species mentioned above, as well as several common species of other grass genera: panic grass, timothy, foxtail, and broomsedge (*Panicum, Phleum, Setaria,* and *Andropogon*). Forbs commonly present include species of asters and goldenrod (*Aster* and *Solidago*) and wild carrot (*Daucus carota*). Interspersed with the grasses and forbs are shrub species such as Russian-olive (*Eleagnus angustifolia*), blackberries and raspberries (*Rubus*) and multiflora rose (*Rosa multiflora*).

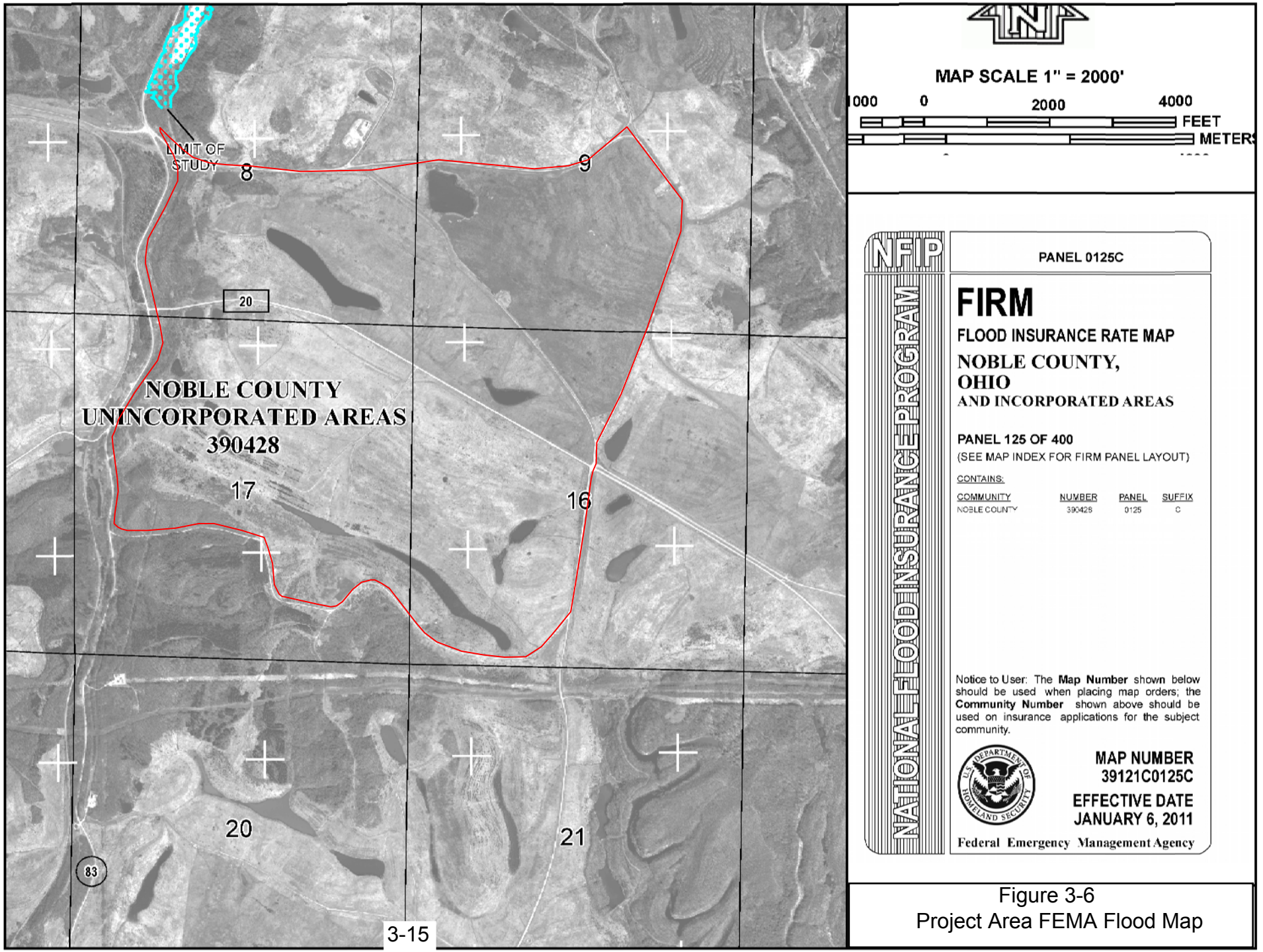


Figure 3-6
Project Area FEMA Flood Map

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 (McGowan and Bookhout 1986). This small mammal community was dominated by the meadow vole (*Microtus pennsylvanicus*), deer mouse (*Peromyscus maniculatus*) and the northern short-tailed shrew (*Blarina brevicauda*). This small mammal population in turn supported a larger population of predators, such as hawks (Accipitrinae), owls (Strigidae and Tytonidae), foxes (*Vulpes vulpes, Urocyon cinereoargenteus*), and weasels (*Mustela* sp.).

3.4.2 Threatened and Endangered Species

The Endangered Species Act of 1973 (ESA) affords legal protection to those species and their habitats that are determined to have met specified criteria for listing by the federal government as either threatened or endangered. The ESA defines a federally endangered species as "any species which is in danger of extinction throughout all or a significant portion of its range." **Table 3-4** provides a list of the federally threatened, endangered, and candidate species for Noble County, Ohio. No federally threatened, endangered or candidate species have been observed in the Project Area. Although some foraging habitat for one species [Indiana bat (*Myotis sodalis*)] occurs along the proposed transmission line corridor, this habitat is low-quality due to a dense understory.

Table 3-4 List of Noble County Federally Protected Threatened, Endangered, and Species of Concern

	Species	**Federal Status**
Birds	Bald eagle (*Haliaeetus leucocephalus*)	SC
Bats	Indiana bat (*Myotis sodalis*)	E

E = Endangered, SC = Species of Concern

Section 7 of ESA requires that all federal agencies consult with the USFWS regarding potential impacts that their federal actions could have to listed species. In response to a RUS consultation letter, the USFWS issued a comment letter on August 22, 2011 (see **Appendix A**) concerning the Project. USFWS indicated that the Project lies within the range of the American burying beetle (*Nicrophorus americanus*) (ABB), a federally listed endangered species. This insect is a generalist as far as habitat preference is concerned and can be found in grasslands, open woodlands, and brushlands. An experimental population of ABB was recently released at The Wilds, a nature preserve approximately three miles west of the Project Area. Additional releases are planned to occur at the Wilds in each of the next four years. Historic use and currently existing habitat at The Wilds is similar in nature to the Project Area. ABB are anticipated to disperse from the release site and are strong fliers, moving as far as a kilometer in one night. USFWS assumed that ABB do occur within the Project Area. In their August 22, 2011 comment letter, the USFWS also provided comments on the Indiana bat, bald eagle, and golden eagle (the latter two, which are protected under the Bald and Golden Eagle Protection Act).

On September 30, 2011, USFWS issued an email containing a revised Federally Listed Species List by Ohio Counties (see **Appendix A**). The email stated: "The following counties have been removed from the lists for the American burying beetle (ABB): Guernsey, Muskingum, and Noble." It stated: "Should any ABBs leave the release property (The Wilds) and be incidentally

taken as a result of an otherwise lawful activity, the beetles will be considered lost to the recovery program and no violation of Section 9 of the ESA will be incurred. Since Noble County is no longer listed as providing potential habitat for the ABB, it is not considered further in this document."

On March 10, 2011, the Ohio Department of Natural Resources (ODNR) Division of Wildlife Ohio Biodiversity Data Base (OBDB) was contacted concerning known records of endangered and threatened species from the three candidate sites being examined in the Site Selection Study. OBDB responded on March 11, 2011 with information concerning each site (see **Appendix A**). In addition, ODNR responded on August 2, 2011 to notification of the proposed Project with comments concerning threatened and endangered species (see **Appendix A**). These comments are discussed below. **Table 3-5** lists State Protected Threatened and Endangered Species known or suspected to occur in Noble County.

Table 3-5 List of Noble County State Protected Threatened and Endangered Species

	Species	**State Status**
Birds	Bald eagle (*Haliaeetus leucocephalus*)	T
	Northern harrier (*Circus cyaneus*)	E
Bats	Indiana bat (*Myotis sodalis*)	E
Other Mammals	Black bear (*Ursus americanus*),	E
	Bobcat (*Lynx rufus*),	E

T = Threatened, E = Endangered

The Project is within the range of the Indiana bat (*Myotis sodalis*), a state and federally endangered species. The following species of trees have relatively high value as potential Indiana bat roost trees: Shagbark hickory (*Carya ovata*), Shellbark hickory (*Carya laciniosa*), Bitternut hickory (*Carya cordiformis*), Black ash (*Fraxinus nigra*), Green ash, White ash (*Fraxinus americana*), Shingle oak (*Quercus imbricaria*), Northern red oak (*Quercus rubra*), Slippery elm (*Ulmus rubra*), American elm (*Ulmus americana*), Eastern cottonwood (*Populus deltoides*), Silver maple (*Acer saccharinum*), Sassafras (*Sassafras albidum*), Post oak (*Quercus stellata*), and White oak (*Quercus alba*). Indiana bat habitat consists of suitable trees that include dead and dying trees of the species listed above with exfoliating bark, crevices, or cavities in upland areas or riparian corridors and living trees of the species listed above with exfoliating bark, cavities, or hollow areas formed from broken branches or tops.

On September 13, 2011 URS Corporation inspected the Project Area for potential summer roosting habitat of the Indiana bat. A memo documenting the inspection was submitted to USFWS on October 25, 2011 (see **Appendix A**). The inspection found that potential foraging opportunities are limited within the Project Site since it has no riparian zones or forested habitats. Within the transmission line corridor, URS found a group of six standing dead trees of proper size that displayed solar exposure and exfoliating bark. In addition, since Rannells Creek, a perennial stream, runs parallel with the proposed transmission line corridor and the eastern portion of the proposed corridor is forested, this portion may be suitable as foraging habitat for

the Indiana bat. Potential roosting and foraging habitat for the Indiana bat is located along the transmission gen-tie corridor.

On November 22, 2011, USFWS responded with questions. URS Corporation answered with a memo addendum on December 7, 2011 (see **Appendix A**). Some tree-cutting will be required to clear this corridor. This activity is not likely to adversely affect the Indiana bat as long as tree cutting occurs between September 30 and April 1 during the time when bats will not likely be using the trees as summer roosting habitat.

The Project is within the range of the bald eagle (*Haliaeetus leucocephalus*), a state threatened species. It and the golden eagle (*Aquila chrysaetos*) are federally protected species under the Bald and Golden Eagle Protection Act. However, the Ohio Biodiversity Database currently has no records of the bald eagle near the Project Area. Golden eagles do not breed in Ohio, but are uncommon winter visitors that are drawn to the large tracts of reclaimed mined lands found throughout much of eastern and southeastern Ohio (Jones, 2011). It is unlikely that the Project would negatively impact golden eagle numbers. The Project is within the range of the black bear (*Ursus americanus*), a state endangered species, and the bobcat (*Lynx rufus*), a state endangered species. The Ohio Biodiversity Database also has a 1994 record for the bobcat near the Project Area. The Ohio Biodiversity Database currently has no records of the black bear within a one-mile radius of the Project Area.

The Project is within the range of the Northern harrier (*Circus cyaneus*), a state endangered bird. Although the Ohio Biodiversity Database has no records of this species within or near the Project Site, a lack of records does not indicate that the species is absent from the area. This is a common migrant and winter species. Nesters are much rarer, although they occasionally breed in large marshes and grasslands. Harriers often nest in loose colonies. The female builds a nest out of sticks on the ground, often on top of a mound. Harriers hunt over grasslands. While harriers have been observed flying over the Project Area, no harrier nests have been observed within the Project Area during Project Area field visits and the site is not expected to provide significant nesting for the species.

3.5 AIR QUALITY

The following sub-sections contain a description of the affected environment, including: climate and meteorology; existing air quality; existing emission sources; regulatory setting; and greenhouse gases.

3.5.1 Climate and Meteorology

The Project Area is located in southeastern Ohio, in the westernmost portion of Noble County. The Project Site and Transmission Corridor are approximately two miles southeast of Noble County's intersection with two other counties, Guernsey and Muskingum. Temperature, precipitation, and snowfall data were readily available for Cambridge, Ohio (approximately 15 miles northeast of the Project Area), and are summarized in **Tables 3-6 through 3-8**. The nearest readily available wind data for public use were found approximately 67 miles west of the project site, at the Columbus International Airport located in Columbus, Ohio. The average annual wind speed at this station was 7 miles per hour (mph) and wind directions were highly variable for all seasons. An annual wind rose is provided in **Figure 3-7** for Columbus, Ohio,

where the wind rose directional petals represent the percentage of time during the year when the wind blows from that direction.

Table 3-6 Temperature Summary

Element	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
Max (°F)	37.9	42.5	53.4	64.9	74.5	81.8	85.0	83.3	76.8	65.9	53.3	42.3	63.5
Min (°F)	20.3	22.7	30.8	39.3	49.0	57.8	62.2	60.9	53.9	41.9	33.8	25.4	41.5
Mean (°F)	29.1	32.6	42.1	52.1	61.8	69.8	73.6	72.1	65.4	53.9	43.6	33.9	52.5

Source: Midwest Regional Climate Center (MRCC), Taken from the following station: Cambridge, OH; Period of Record: 1971-2000

Table 3-7 Precipitation Averages

Element	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
Precip (in)	2.73	2.3	3.01	3.34	3.95	4.03	4.25	3.93	2.99	2.56	3.24	2.83	39.16

Source: Midwest Regional Climate Center (MRCC), Taken from the following station: Cambridge, OH; Period of Record: 1971-2000

Table 3-8 Snowfall Averages

Element	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
Snow(in)	7.6	4.2	2.7	0.6	0	0	0	0	0	0	0.8	2.8	18.7

Source: Midwest Regional Climate Center (MRCC), Taken from the following station: Cambridge, OH; Period of Record: 1971-2000

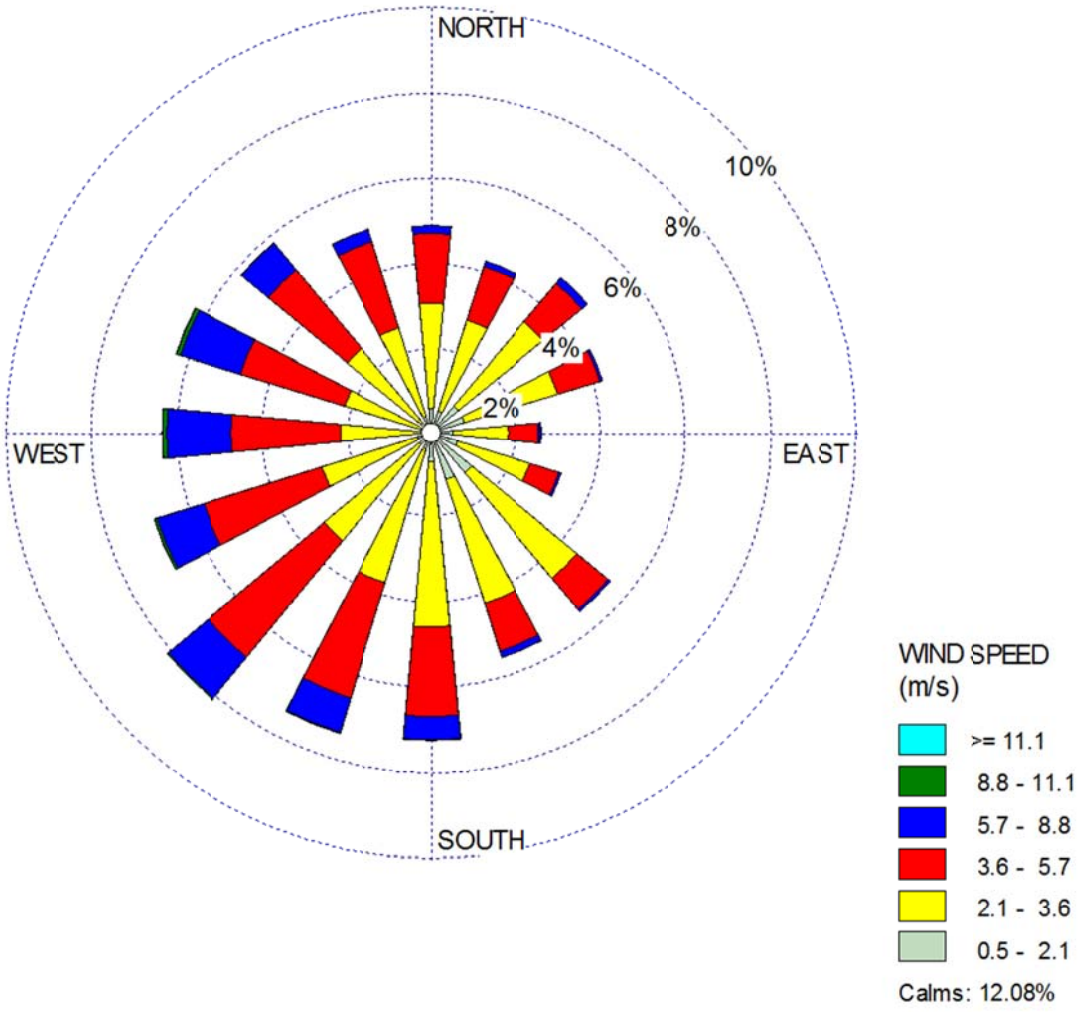


Figure 3-7 Wind Rose for Columbus, Ohio for Years 1988-1992

(figure depicts the direction from which the wind blows)

Source: http://www.webmet.com/MetGuide/SCRAMSurface.html.

3.5.2 Air Quality

The air quality of the proposed Project Site and surrounding area in Noble County is currently designated as in attainment or unclassifiable for all criteria pollutant ambient standards established by the U.S. Environmental Protection Agency (USEPA) in Title 40 of the Code of Federal Regulations, Chapter 81 (40 CFR 81).

Southeastern Ohio has few monitoring locations. Thus, appropriate data to represent the Project Site was selected based upon two criteria, one being the proximity of the station to the Project Site and the other being the location type (i.e. rural, suburban, urban). **Table 3-9** is a compilation of ambient air quality monitoring data chosen to best represent the Project Site.

3.5.3 Existing Emission Sources

The proposed Project Site is currently undeveloped rural land in Noble County. The following list of permitted facilities in Noble County was obtained from Ohio EPA's air division:

- Northwood Energy - Summerfield Compressor
- BP – Caldwell Bulk Plant
- Atlas Pipeline Ohio LLC—Noble 10
- Sharon Stone Company
- King Quarries Inc.
- International Converter Inc.
- Sharon Stone Company—Newberry Sand & Gravel
- Elk Compressor Station (Cobra Pipeline Company Ltd.)
- International Converter, Inc. - Caldwell

3.5.4 Regulatory Setting

Air quality management and protection responsibilities exist at the federal, state, and local levels of government. However, the primary statutes that establish ambient air quality standards and establish regulatory authorities to enforce regulations designed to attain those standards are the federal Clean Air Act (CAA).

Table 3-9: Ambient Air Quality Monitoring Data

Year	CO		NO_2	O_3		SO_2		$PM_{2.5}$		PM_{10}		Pb
	2nd Max 1-hr value	2nd Max 8-hr value	Annual Mean value	2nd Max 1-hr value	4th Max 8-hr value	2nd Max 24-hr value	Annual Mean value	98th Pct'l value	Annual Mean value	2nd Max 24-hr value	Annual Mean value	Qtr'ly Mean value
2004	8.1	3	--	0.084	0.074	0.052	0.008	33.1	11.43	60	25	0.01
2005	5.9	4.4	--	0.098	0.082	0.036	0.008	33.1	13.27	64	31	0.01
2006	8.4	4.4	--	0.085	0.072	0.071	0.007	29.5	11.76	57	25	0.01
2007	9.7	4.8	0.005	0.095	0.078	0.039	0.007	37.2	12.99	51	25	0.01
2008	--	--	0.005	0.082	0.074	0.037	0.007	28	10.26	--	--	0.01

County	Jeffers.	Jeffers.	Athens	Licking	Licking	Morgan	Morgan	Athens	Athens	Wash.	Wash.	Wash.
Location type	urban	urban	Rural	Rural	rural	rural	Rural	rural	rural	rural	rural	suburb

Sources/Notes: Locational data found at: http://www.epa.state.oh.us/dapc/airohio/report_monitors.aspx
Measurement data found at: http://www.epa.gov/air/data/repsst.html?st~OH~Ohio
*Green-highlighted value was flagged in USEPA database, but no explanation was provided.

Max = maximum; hr = hour; Pct'l = percentile; Qtr'ly = quarterly; Jeffer. = Jefferson; Wash. = Washington; suburb = suburban; -- = no data.

3.5.4.1 Federal Level

Clean Air Act

As required by the federal CAA, the USEPA has established and continues to update the National Ambient Air Quality Standards ("NAAQS") for specific "criteria" air pollutants: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter 10 microns in diameter or smaller (PM_{10}) (inhalable particulate matter), particulate matter 2.5 microns in diameter or smaller ($PM_{2.5}$) (fine particulate matter), and lead (Pb). The NAAQS for these pollutants are listed in **Table 3-10** and represent the levels of air quality deemed necessary by USEPA to protect the public health and welfare with an adequate margin of safety. In addition, the USEPA is responsible for setting minimum New Source Review permitting and Operating Permit requirements for stationary sources; establishing New Source Performance Standards, National Emission Standards for Hazardous Pollutants, and the Acid Deposition Control program; and administering regional air quality initiatives.

Table 3-10 National Ambient Air Quality Standards

Pollutant	Averaging Time	Standard, in Parts Per Million By Volume (ppmv)	Standard, in Micrograms per Cubic Meter (mcg/m^3)	Violation Criteria
Ozone (O_3)	8-Hour	0.075	137	If exceeded on more than 3 days in 3 years.
Carbon Monoxide (CO)	1-Hour	35	40,000	If exceeded on more than 1 day per year.
	8-Hour	9	10,000	If exceeded on more than 1 day per year.
Nitrogen Dioxide (NO_2)	1-Hour	0.100	188	The 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed these.
	Annual	0.053	100	If exceeded.
Sulfur dioxide (SO_2)	1-Hour	0.075	196	The 3-year average of the 99th percentile of the 1-hour daily maximum concentrations must not exceed these.
	3-Hour	0.5	1,300	If exceeded on more than 1 day per year.

Table 3-10 National Ambient Air Quality Standards

Pollutant	Averaging Time	Standard, in Parts Per Million By Volume (ppmv)	Standard, in Micrograms per Cubic Meter (mcg/m^3)	Violation Criteria
Respirable Particulate Matter (PM_{10})	24-Hour	N/A	150	If exceeded on more than 1 day per year.
Fine Particulate Matter ($PM_{2.5}$)	24-Hour	N/A	35	If exceeded on more than 1 day per year.
	Annual	N/A	15.0	If exceeded.
Lead (Pb)	Calendar Quarter	N/A	1.5	If exceeded.
	Rolling 3-Month Average	N/A	0.15	If exceeded.

General Conformity

Regulations promulgated pursuant to the federal CAA provisions on General Conformity require that projects in federal nonattainment areas that could be built with funding from a federal agency such as the RUS must demonstrate conformity with the applicable state or local attainment plan. However, as discussed in **Section 3.5.3**, the proposed Project is not in a nonattainment or maintenance area.

3.5.4.2 State and Local Level

At the local level, Noble County is one of 23 counties served by OEPA's Southeast District Office, located in Logan, Ohio. District personnel review permit applications; evaluate sites for proposed facilities; investigate complaints; inspect facilities; identify environmental violations and prepare recommendations for enforcement; provide technical assistance; and maintain contact with the public. (http://www.epa.ohio.gov/Default.aspx?alias=www.epa.ohio.gov/sedo).

At the state level, the Division of Air Pollution Control is one of six regulatory divisions that make up the OEPA. OEPA air pollution regulations are located in the Ohio Administrative Code (OAC) in chapters 3745-14 to 3745-26, 3745-31, 3745-71 to 3745-80, 3745-100 to 3745-105, 3745-108, 3745-109, and 3745-112 to 3745-114. Additional chapters are added as needed to address new laws and requirements related to air pollution control. Rules from those chapters that potentially apply to the Proposed Project are the following:

- 3745-17-08 Restriction of emission of fugitive dust
- 3745-25-02 Ambient air quality standards
- 3745-31-03 Exemptions and permit-by-rule (http://www.epa.state.oh.us/dapc/regs/regs.aspx)

(Note: Only draft versions for these three rules were found readily available on the OEPA webpage; their status and applicability shall be re-assessed upon permitting and project execution.)

OAC 3745-31-03 contains both exemptions and permit-by-rule provisions for emergency electrical generators and gasoline stations with appropriate Stage I (or Stage I and II) vapor controls (http://www.epa.ohio.gov/portals/41/sb/PBRfactsheet.pdf). Appropriate permit applications will be filed with the OEPA for sources such as the Project emergency generator and any applicable fuel dispensing equipment.

Lastly, OAC Chapter 3745-102 encompasses the federal general conformity rules. As previously discussed, subsection (B) of 3745-102-03 (Applicability) states that a conformity determination is not required since the Project Area does not fall within a nonattainment or maintenance area.

3.5.5 Greenhouse Gases

Gases that trap heat in the atmosphere are often called greenhouse gases (GHGs), analogous to the way in which a greenhouse retains heat. Scientists are in general agreement that the Earth's climate is gradually changing, and that the change is due, at least in part, to emissions of CO_2 and other GHGs from man-made sources. Global warming is the observed increase in average temperature of the earth's surface and atmosphere, primarily caused by an increase in GHG emissions in the atmosphere. The majority of the current scientific community believes that human events and activities, such as the industrial revolution and the increased consumption of fossil fuels (e.g., combustion of gasoline, diesel, coal, etc.), have heavily contributed to the increase in atmospheric levels of GHG emissions.

The most common GHGs emitted from natural processes and human activities include carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). Examples of GHGs created and emitted primarily through human activities include fluorinated gases (hydrofluorocarbons and perfluorocarbons) and sulfur hexafluoride. Each GHG is assigned a global warming potential (GWP). The GWP is the ability of a gas or aerosol to trap heat in the atmosphere. The GWP rating system is standardized to CO_2, which has a value of one. For example, CH_4 has a GWP of 21, which means that its global warming effect is 21 times greater than that of CO_2 on an equal-mass basis. To simplify analyses, total GHG emissions from a source are often expressed as a CO_2 equivalent (CO_2e). The CO_2e is calculated by multiplying the emission rate of each GHG by its GWP and adding the results together to produce a single, combined emission rate representing all GHGs.

Since ambient air quality standards for GHGs have not been established, there are no means by which to designate an area as attainment or non-attainment in regards to GHGs. Moreover, since the potential effects of GHG emissions are global in nature, a discussion of the local GHG baseline is not meaningful. In the United States, the net CO_2e emissions generated from all sources in 2007 was approximately 6,088 million metric tons (USEPA, 2009).

3.5.6 Sensitive Receptors

Sensitive receptors identified in the rural project vicinity include scattered residential properties along Belle Valley Road (OH 340), located east of the proposed Project Area. The closest of these to the Project appears to be an occupied residence at 11780 Belle Valley Road, approximately 4,000 feet east of the Project boundary.

3.6 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

In order to identify general socioeconomic patterns in the Project Area, various socioeconomic characteristics have been analyzed, including population growth trends, racial and ethnic characteristics, economic indicators, and employment data. Data is analyzed at various geographic levels for the purpose of comparison.

3.6.1 Population Growth Trends

The Project Area is located in Noble County, Ohio, a county that has experienced moderate population growth over the past decade. The population of Noble County grew from 14,058 persons in 2000 to 14,645 persons in 2010 (**Table 3-11**). This translates to a growth rate of 4.2 percent. For comparison, over this same time period the growth rate for the United States was 9.7 percent and for the state of Ohio was 1.6 percent. The Project Area is located within Block Group 1 of Noble County Census Tract 9685 **(Figure 3-9)**, which experienced moderate population declines over the past decade. Between the year 2000 and 2010, the population in this census tract declined by 21 persons, from 693 to 672. This translates to a decline of 3 percent. **Figure 3-8** demonstrates that the Project is located within a large, sparsely-populated (<25 persons per square mile) section of southeast Ohio.

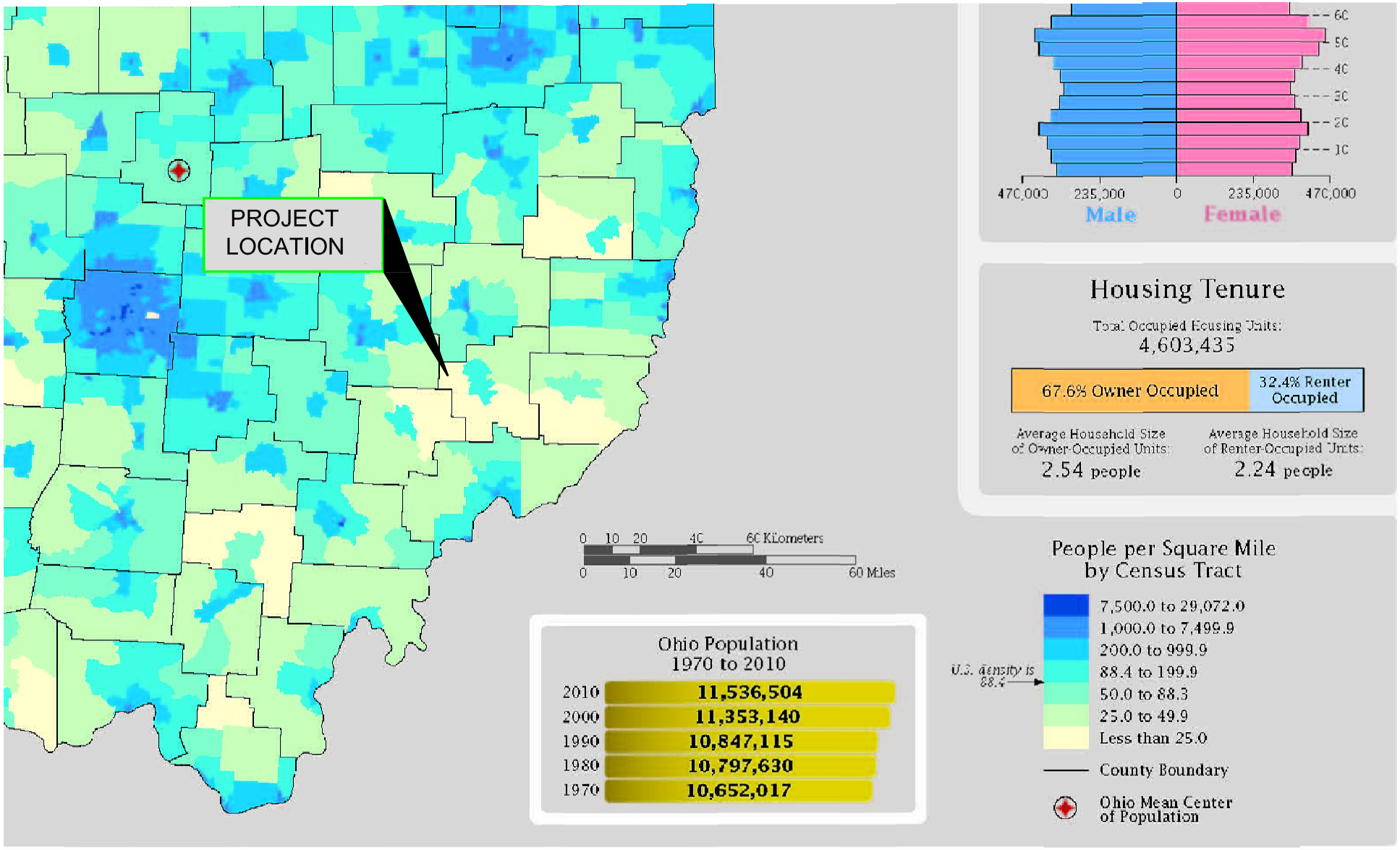
Table 3-11 Population Trends

	Population		% Change 2000 to 2010
	2000	2010	
United States	281,424,602	308,745,538	9.7%
Ohio	11,353,150	11,536,504	1.6%
Noble County	14,058	14,645	4.2%
Census Tract 9685, Block Group 1, Noble County	693	672	-3.0 %

Source: U.S. Census Bureau, 2000 and 2010 Census

3.6.2 Racial and Ethnic Characteristics

Table 3-12, Population by Race/Ethnicity, displays data on race and ethnicity in order to assess the racial composition of the population in and around the Project Area. Data is reported for the 2010 Census at the county and census block group levels. Block Group 1 of Census Tract 9685 contains the Project Area. Census block group level data is reported for all census block groups that abut the Project Area. **Figure 3-9** shows the block groups that were selected for analysis. As shown in **Table 3-12**, Population by Race/Ethnicity, the majority of the population of Noble County, including all the block groups surrounding the Project Area, are overwhelmingly white.



ation U.S. CENSUS BUREAU

0 30 miles

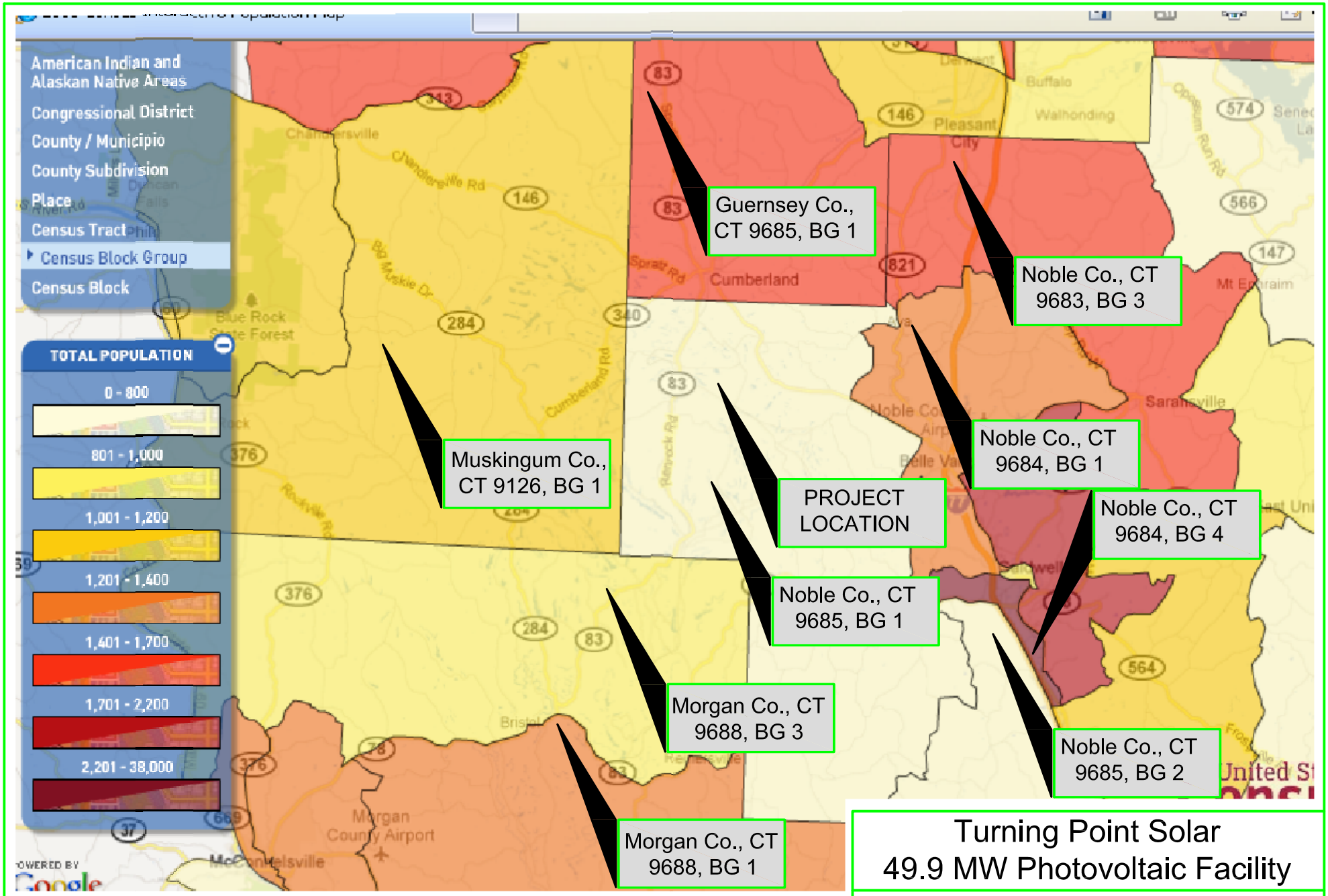
1" = 30 miles

Source: http://www2.census.gov/geo/maps/dc10_thematic/2010_Profile/2010_Profile_Map_Ohio.pdf

Turning Point Solar
49.9 MW Photovoltaic Facility

Figure 3-8. 2010 Census Ohio Profile Map

URS



0 3 miles

1" = 3 miles

CT = Census Tract
BG = Block Group

Source: http://2010.census.gov/2010census/popmap/index.php

Turning Point Solar
49.9 MW Photovoltaic Facility

Figure 3-9. Census Tract and Block Group Map

URS

Table 3-12 Population by Race/Ethnicity

	Total	White	Black or African American	American Indian/ Alaskan	Asian	Hawaiian/ Pacific Islander	Some other race	Two or more races	Hispanic*
Noble County	14,645	96.1%	2.5%	0.1%	0.3%	0.0%	0.2%	0.8%	0.4%
Noble Co., Census Tract 9685, Block Group 1	672	97.6%	0.0%	0.0%	0.4%	0.0%	1.0%	0.9%	1.2%
Noble Co., Census Tract 9685, Block Group 2	730	98.4%	0.0%	0.1%	0.0%	0.0%	0.0%	1.5%	0.5%
Noble Co., Census Tract 9683, Block Group 3	1,475	98.8%	0.1%	0.0%	0.3%	0.0%	0.0%	0.7%	0.5%
Noble Co., Census Tract 9684, Block Group 1	1,301	99.0%	0.0%	0.0%	0.2%	0.0%	0.2%	0.6%	0.3%
Noble Co., Census Tract 9684, Block Group 4	3,085	87.6%	11.5%	0.0%	0.4%	0.0%	0.2%	0.4%	0.3%
Morgan Co., Census Tract 9688, Block Group 1	1,243	97.7%	0.7%	0.0%	0.2%	0.0%	0.1%	1.4%	0.3%
Morgan Co., Census Tract 9688, Block Group 3	983	94.9%	1.5%	0.1%	0.3%	0.0%	0.0%	3.2%	0.4%
Muskingum Co., Census Tract 9126, Block Group 1	1,145	98.5%	0.8%	0.2%	0.0%	0.1%	0.0%	0.4%	0.4%
Guernsey Co., Census Tract 9780, Block Group 3	1,457	96.0%	0.9%	0.3%	0.3%	0.0%	0.4%	2.1%	1.0%

Source: U.S. Census Bureau, 2010 Census

The largest minority group in Noble County is Black or African American. The racial composition of the population of Noble County Census Tract 9685, Block Group 1 is similar to that of Noble County as a whole, with White residents comprising a majority of the population. However, this Block Group has no Black or African American residents.

3.6.3 Economic Indicators

Section 1.1 discusses the fact that Turning Point Solar intentionally located the Project in Ohio's Appalachian region to serve as a centerpiece for integrated rural economic development. Ohio's Appalachian Region has fared far worse in the current recession than the rest of the nation. To demonstrate that this is not just a recent phenomenon, **Table 3-13** presents a comparison of select economic indicators from the 2000 Census. Data is analyzed at the national, state, county and census block group level.

Table 3-13 Economic Indicators – 1990 and 2000 Census Data

	Total Population	Per Capita Income	% Population Below Poverty Level
United States – 1990	248,709,873	$14,420	13.1%
United States – 2000	281,421,906	$21,587	12.4%
Ohio – 1990	10,847,115	$13,461	12.5%
Ohio – 2000	11,353,140	$21,003	10.6%
Noble County – 1990	11,336	$9,028	16.4%
Noble County – 2000	14,058	$14,100	11.4%

Table 3-13 Economic Indicators – 1990 and 2000 Census Data

	Total Population	Per Capita Income	% Population Below Poverty Level
Census Tract 9685, Block Group 1 - 1990	680	$9,809	7.1%
Census Tract 9685, Block Group 1 - 2000	709	$14,227	12.0%

Source: U.S. Census Bureau, 2000 Census

The 2000 Census reports income and poverty levels for the year 1999, whereas the 1990 Census reports these data for 1989. As shown in **Table 3-13**, the per capita income in Noble County was considerably lower than comparable figures for the U.S. and Ohio in both the 1990 and 2000 census. Similarly, the percent below poverty levels were higher in Noble County in both the 1990 and 2000 census. Within Noble County, the per capita income of the population in Census Tract 9686, Block Group 1, was slightly higher than that of Noble County's population as a whole in both the 1990 and 2000 census (**Table 3-13**). However, even with the slightly higher income in Block Group 1, the per capita incomes of both Noble County and Block Group 1, 1990 and 2000 are only about two-thirds that of the state and nation. Similarly, while the poverty rate for the population of Census Tract 9686, Block Group 1 in 1990 of 7.1 percent was lower than the County's rate of 16.4 percent, by the year 2000, the poverty rate of Block Group 1 exceeded the County's by 0.6 percent. Unlike per capita income, however, and excluding the seemingly anomalous 7.1 percent of 1990 for Block Group 1, these poverty rates were roughly comparable to state and national rates in 1990 and 2000. A comparison of these data with the Noble County persons below poverty rate for 2008 (16.5 percent) demonstrates that conditions have worsened in Noble county since 1999. In an update of the most recently available unemployment statistics (July 2011), Noble County is tied for the ninth highest unemployment rate (12.5 percent) among Ohio's 88 counties. Adjacent Morgan County is sixth with an unemployment rate of 12.8 percent (Bureau of Labor Market Information, 2011).

3.7 CULTURAL RESOURCES AND HISTORIC PROPERTIES

In accordance with Section 106 of the National Historic Preservation Act (Section 106) and 36 CFR Part 800, federal agencies are required to take into account the effects of their undertakings on historic properties (i.e., those properties listed or eligible for listing in the National Register of Historic Places) and afford the Advisory Council on Historic Preservation (Council) a reasonable opportunity to comment on such undertakings. The federal agency is responsible for coordination with consulting parties which, in Ohio, may include the Ohio Historic Preservation Office (OHPO), the public, the Council, local governments, recognized Native American Tribes and applicants. A cultural resources assessment was completed to assist RUS in meeting its compliance requirements under Section 106 (See **Appendix C**).

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 Area of Potential Effects (APE). The APE for this Project consists of the land directly impacted by ground disturbance (direct APE), which was considered to be the entire 771 acre site and transmission line corridor. It is, however, important to note that only about 400 acres of the Project will be subjected to ground disturbance (**Figures 2-14a and 2-14b**). The surrounding viewshed (indirect APE) includes all cultural resources that may be visually impacted by the construction of the Project within one

mile of the direct APE (**Figure 3-10)**. For ease of reference, the direct and indirect APE together will be referred to as the Project Study Area where appropriate.

The majority of the direct APE is located within a strip mine in a very rural setting adjacent to Route 83 (Renrock Road) and Chapel Drive (**Figures 3-10 and 3-11**). When mining ceased, reclamation efforts required gently rolling grasslands to be established. The site was graded and seeded for open grass fields and ponds. As a result, the general Project Area consists of open grass fields, rolling terrain, and pastures used for livestock and recreation. The rolling terrain ranges in elevation from 990 feet to 1,100 feet AMSL, with slopes ranging from approximately one to 20 percent.

According to the soil survey for Noble County, Ohio, the soils within the direct APE consist of the Udorthents-Pits soil complex and Morristown soils (Waters and Roth 1990), which indicates that the entire direct APE has been disturbed. The Udorthents-Pits soil complex, located roughly within the southern two thirds of the direct APE, is typical of areas that have been surface-mined for coal or limestone consisting of a mixture of rock fragments and unweathered fine material. These soils correspond with the areas that are labeled as strip mined on the USGS topographic map (**Figure 3-10)**.

Morristown silty clay loams are documented in the northern third of the direct APE and are typically located on mine-spoil ridgetops within areas that have been surface-mined for coal. As mentioned above, the Project Area was subsequently "reclaimed by grading and by blanketing the surface with a layer of material removed from areas of other soils" (Waters and Roth 1990). It therefore seems apparent that none of the direct APE remains undisturbed.

A background records review of the OHPO on-line mapping system was conducted for the entire 771-acre direct APE, in addition to a one-mile (1.6-kilometer) buffer around the direct APE, which includes the indirect APE. The archival study included a review of the cultural resources and previous survey work inventoried with the OHPO as detailed in the Ohio Archaeological Inventory (OAI), Ohio Historic Inventory (OHI), and National Register of Historic Places (NRHP).

Based on the background check, two archaeological sites and two previous cultural resource surveys were identified within the Project Study Area. In addition, the Brookfield Cemetery was identified within the Project Study Area through review of the USGS 7.5 minute topographic map. No historic above-ground resources or NRHP-listed properties were indicated within the Project Study Area.

3.7.1 Archaeological Sites

The two OAI-listed archaeological sites within the Project Study Area are unassigned prehistoric occupations (**Table 3-12**). These sites occur in an open setting, and distance to water ranges from approximately 220 meters to 270 meters (724 feet to 888 feet). The NRHP status of these sites is not available through the OHPO on-line mapping system, and neither site was defined in close proximity to the direct APE of the Project since both sites were located between three quarters to one mile away from the Project Area.

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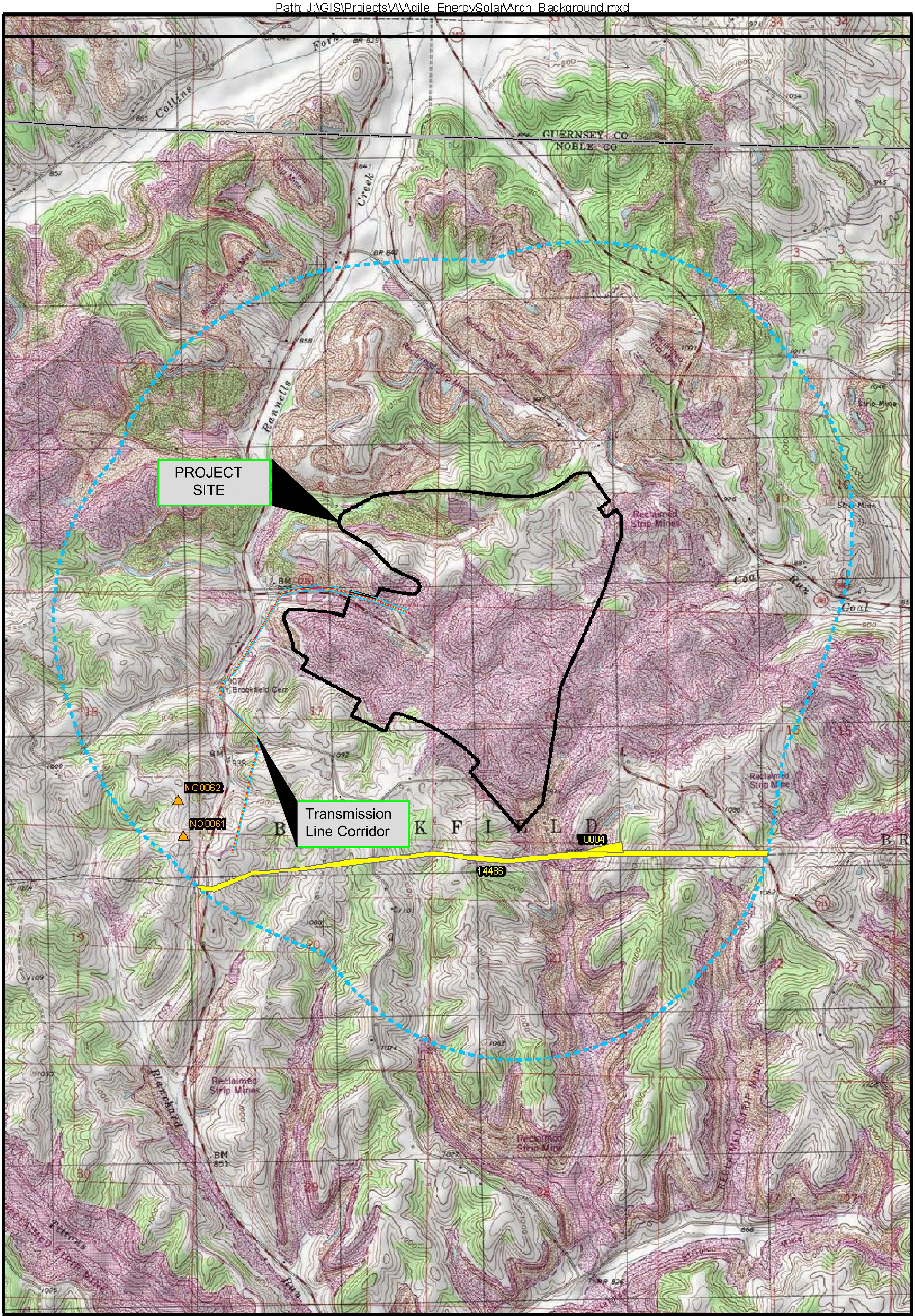

LEGEND:
- Study Area
- 1 Mile Buffer
- Archaeology Site
- Previously Surveyed Phase I Area
- County Boundary

0 2,000 4,000

Scale In Feet

BASE MAP SOURCE:
ESRI USA Topo Maps,
2011 National Geographic Society

N

AGILE ENERGY SOLAR PROJECT

FIGURE 3-10
CULTURAL RESOURCES
OVERVIEW - Topo Map

JOB NO. 13814246

URS

Table 3-14 Previously Recorded Archaeological Sites within the Project Study Area

OAI Site #	Temporal Period	Setting	Distance to Water (meters/ feet)	Distance from Project Area (meters/ feet)
33No0061	Unassigned Prehistoric	Open Site	220/ 724	1429.6/ 4690.3
33No0062	Unassigned Prehistoric	Open Site	270/ 888	1257.8/ 4126.5

The results of the background check for archaeological sites, as outlined in **Table 3-14** above, indicate that very few sites have been identified across this portion of Noble County. This could be the result of a lack of cultural resources surveys conducted during the modern era given the rural setting of Noble County or because the area was strip mined.

3.7.2 Previous Cultural Resource Survey Areas

Two previous cultural resources surveys have been conducted within the Project Study Area (**Figures 3-10 and 3-11**). **Table 3-15** summarizes these surveys. None of the previous cultural resource surveys extended within the direct APE; however, survey ID# 14486 is located 191 meters (627 feet) south of the direct APE. No cultural resources were identified in either survey.

Table 3-15 Summary of Previous Cultural Resource Surveys

ID#	Date	Authors	Title of Report	Size of Surveyed Area (acres)	Distance from Project Area (meters/ feet)
T0004	1994	Luella Beth Hilen	Second Addendum: Reconnaissance Survey for a Proposed Gas Pipeline through portions of Fairfield, Perry, Muskingum, and Noble Counties, Ohio	3.2	419/ 1374.4
14486	1993	Rae Norris Sprague	Reconnaissance Survey for a Proposed Gas Pipeline through portions of Fairfield, Perry, Muskingum, and Noble Counties, Ohio	128.5	191.2/ 627.2

3.7.3 Cemeteries

No cemeteries were identified through the OHPO on-line mapping system. However, further review of the USGS 7.5 minute topographic map identified one cemetery (Brookfield Cemetery) within the indirect APE on the west side of Route 83 (**Figures 3-10 and 3-12**) but not within the bounds of the direct APE itself. According to the website, www.findagrave.com, a listing of 167 grave markers is recorded for this cemetery. The oldest grave marker inventoried on this website dates to 1817, while the most recent dates to 1979. No other information could be located to indicate the nature of Brookfield Cemetery (a single family cemetery, associated with a church, etc.).

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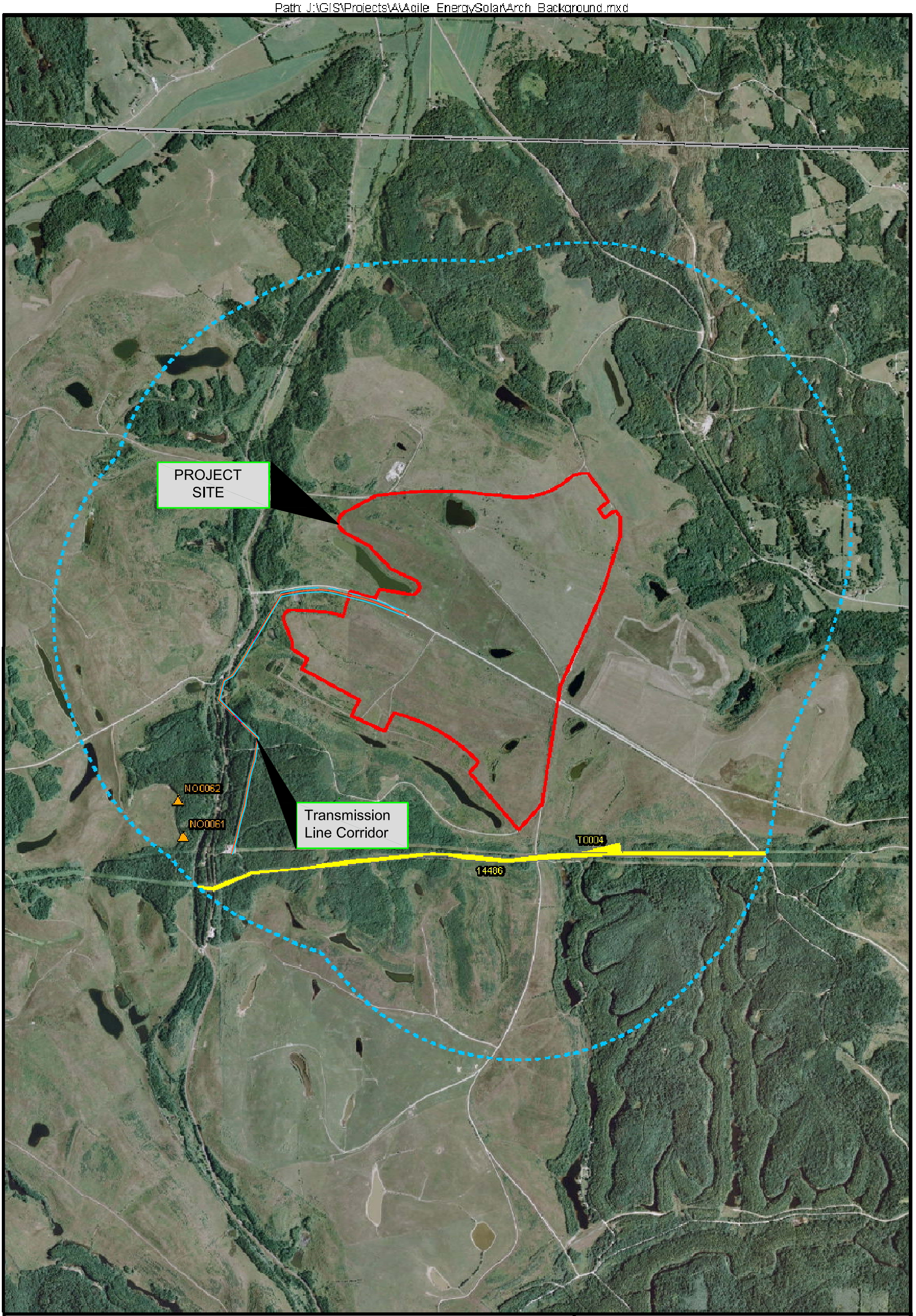

LEGEND:
- Study Area
- 1 Mile Buffer
- Archaeology Site
- Previously Surveyed Phase I Area
- County Boundary

0 2,000 4,000
Scale In Feet

BASE MAP SOURCE:
ESRI, USA Prime Imagery

N

AGILE ENERGY SOLAR PROJECT

FIGURE 3-11
CULTURAL RESOURCES
OVERVIEW - Aerial View

JOB NO. 13814246

URS

Figure 3-12. Oblique aerial view of Brookfield Cemetery, looking north.

3.7.4 Results of the Site Visit

A site visit to the Project Area was conducted by URS on August 23, 2011 to document any visible disturbance within the direct APE and to examine the surrounding viewshed of the Project. The site visit confirmed that the Project Area had been previously disturbed by strip mining as evidenced by the reclamation efforts of open grasslands and ponds. URS also examined exposed soils if they showed evidence of disturbance such as the presence of gravels (not natural) and the absence of topsoil.

Several oil pumps, wells, and storage tanks were documented along Chapel Drive (which runs through the center of the Project) and within the northeast corner of the direct APE (**Figures 2-14a, 2-14b and 3-11**). These were the only above-ground features documented within the direct APE, and they do not appear to be older than 50 years.

The assessment of the viewshed confirmed that the Project Area is situated within a very rural setting of Noble County. The direct APE is within rolling terrain that is covered in tall grasses and pasture. The site visit did not document any above-ground structures (50 years or older) within the direct APE or visible from the direct APE.

3.7.5 Archaeological Conclusions

The archival research identified a very low number of archaeological sites (n=2) within one mile of the Project Area, which suggests a low potential for archaeological resources. This suggestion is supported by previous cultural resources work conducted in the area, which has resulted in few archaeological sites being identified. For example, a pipeline survey conducted just south of the Project surveyed 128.5 acres and did not identify any archaeological resources.

In addition, the direct APE has been severely disturbed as a result of strip mining as evidenced by the soils documented by Waters and Roth (1990), the exposed soils visible during the URS site visit, and a review of historic aerial photographs and topographic maps (see Attachment C in **Appendix C**), which illustrate the strip mining activities. It is important to note that although the

mapping presented in this document does not illustrate strip mining activities in the northern third of the direct APE, the soils documented within this area (Morristown silty clay loams) indicate that the northern third of the direct APE has been graded with mine spoil. Therefore, there is an extremely low potential for finding intact historic properties in the direct APE.

3.7.6 Viewshed Conclusions

Background research did not identify any historic above-ground resources within the Project Study Area. Only the Brookfield Cemetery was identified within the indirect APE from the USGS topographic map, and it is located on the west side of SR 83, approximately 2,000 feet from the direct APE. This cemetery has graves dating from 1817 to 1979. The cemetery would be visually buffered by a ridge and trees between it and the direct APE. Overall, Project mapping (topographic and aerial) and the URS site visit indicated a relatively rural setting with very few structures located within both the direct and indirect APE. In addition, none of these structures appeared to be older than 50 years and therefore would not be potentially eligible for NRHP listing.

3.8 AESTHETICS

The visual character of an area is a function of the terrain, land cover and land use. Within the Project Study Area, the land cover was historically dominated by woodlands, but now contains large areas of grasslands resulting from strip mine reclamation after 1972. Highways and local roads, many of which are gravel, cross the area. In addition, multiple transmission lines, distribution lines and other types of development contribute to the overall visual character of the area. SR 83 is located in Rannell's Creek Valley. The Valley's topography and vegetation shields the Project Site from passing motorists.

The visual character of the area for the proposed substation site and the transmission line corridor is mostly grasslands with scattered areas of woodlands. An existing transmission line parallels SR 83/Rannell's Creek in the Project Area. Other transmission lines run east-west just south of the Project Area. These lines border the existing South Cumberland Substation site on the east and south.

3.9 NOISE

URS collected field noise measurement data on August 22 and 23, 2011. These data were analyzed in the Noise & Vibration Study (NVS) prepared for the Project (see **Appendix B-2**). The following is a summary of the findings of that report.

3.9.1 Noise and Vibration Fundamentals

3.9.1.1 Sound

Section 1.1 of the NVS presents a background of acoustical concepts and definitions of key terms, metrics and statistics that are used to evaluate environmental noise effects (see **Appendix B-2**). For purposes of convenience, this background is summarized as follows:

- Frequency or sound pitch is measured in Hertz (Hz).
- Sound amplitude is measured in decibels (dB), and with respect to a logarithmic scale.

Figure 3-13 Typical A-weighted Sound (Noise) Levels, adapted from Colby et al., 2009.

TYPICAL SOUND PRESSURE LEVELS MEASURED IN THE ENVIRONMENT AND INDUSTRY

Noise Source At a Given Distance	A-Weighted Sound Level in Decibels	Qualitative Description
Carrier deck jet operation	140	
	130	Pain threshold
Jet takeoff (200 feet)	120	
Auto horn (3 feet)	110	Maximum vocal effort
Jet takeoff (1000 feet) Shout (0.5 feet)	100	
N.Y. subway station Heavy truck (50 feet)	90	Very annoying Hearing damage (8-hour, continuous exposure)
Pneumatic drill (50 feet)	80	Annoying
Freight train (50 feet) Freeway traffic (50 feet)	70 to 80	
	70	Intrusive (Telephone use difficult)
Air conditioning unit (20 feet)	60	
Light auto traffic (50 feet)	50	Quiet
Living room Bedroom	40	
Library Soft whisper (5 feet)	30	Very quiet
Broadcasting/Recording studio	20	
	10	Just audible

- Average healthy human hearing can barely perceive a 1 to 2 dB change in sound level. A 3 to 5 dB change is readily perceived. A change in sound level of about 10 dB is usually perceived by the average person as a doubling (or if -10 dB, halving) of the sound's loudness.
- Sound levels combine logarithmically, not algebraically. Example: 60 dB + 60 dB = 63 dB.
- Sound pressure level (SPL, or Lp) depends not only on the sound power level (PWL, or Lw) of the source, but also on the distance from the source and on the acoustical characteristics of the space surrounding the source. PWL, on the other hand, is independent of these environmental factors.
- A-weighted sound levels (dBA) indicate that a set of dB adjustments (to reflect frequency-dependent human hearing sensitivity) has been applied to otherwise "flat" or unweighted measurement data.

- L_{eq} is the energy-mean or "equivalent" dB of a time-varying sound level during a measured time interval.
- L_{max} and L_{min} are maximum and minimum measured sound levels over a given measurement time period.
- L_{10}, L_{50}, and L_{90} are statistical descriptors that represent what sound levels are exceeded 10 percent, 50 percent, and 90 percent of the measured time interval, respectively.
- The Day-Night Average Noise Level (L_{dn}) is defined as the A-weighted average sound level for a 24-hour day with a 10-dB penalty added to nighttime sound levels (10:00 p.m. to 7:00 a.m.).

3.9.1.2 Vibration

Section 1.2 of the NVS provides background information to help the reader understand basic vibration concepts and metrics. For purposes of convenience, highlights are as follows:

- Vibration can be described in terms of the peak particle velocity (PPV), measured in inches per second (in/sec).
- Vibration propagates according to the following expression, based on point sources with normal propagation conditions:

$$PPV_{equip} = PPV_{ref}\left(\frac{D_{ref}}{D}\right)^{1.5}$$

where: PPV_{equip} = the peak particle velocity in in/sec of the equipment adjusted for distance

PPV_{ref} = the reference vibration level in in/sec at D_{ref}

D_{ref} = the reference distance (25 feet if using data from Table 2 of the NVS)

D = the distance from the equipment to the receiver

3.9.2 Project Setting

The Project is surrounded by lands that could reasonably be characterized as rural, with a mixture of wooded and pastoral areas. Nearby roadways include Belle Valley Road (SR 340) to the east, Renrock Road (SR 83) to the west, and Hedge Road (Township Highway 2) to the south, with Chapel Drive (County Highway 20) running east-west and roughly bisecting the Project Area. Nearest residential receivers along SR 340 to the northeast of the Project are few in number and appear to be as close as approximately 0.8 miles (1.3 km) away from the Project Area.

As described in Section 2.2 of the NVS, existing outdoor ambient sound levels of the Project Area and its immediate vicinity were estimated with appropriate industry guidance and representatively measured by way of a field survey performed by URS in August of 2011. Measurements suggest that ambient sound levels are within a range of 55 to 65 dBA L_{dn}. The Lp at the closest noise-sensitive receiver, LT-02, appears to be 58 dBA L_{dn} (**Figure 3-14).**

3.9.3 Regulatory Setting

As the NVS Section 2.3 describes in greater detail, the absence of federal, state and local laws, ordinances, regulations and standards that apply to the Project suggest that the EPA guidance indicators of 55 dBA L_{dn} outdoors and 45 dBA L_{dn} indoors should be used in this EA as reasonable evaluators of potential environmental noise effect.

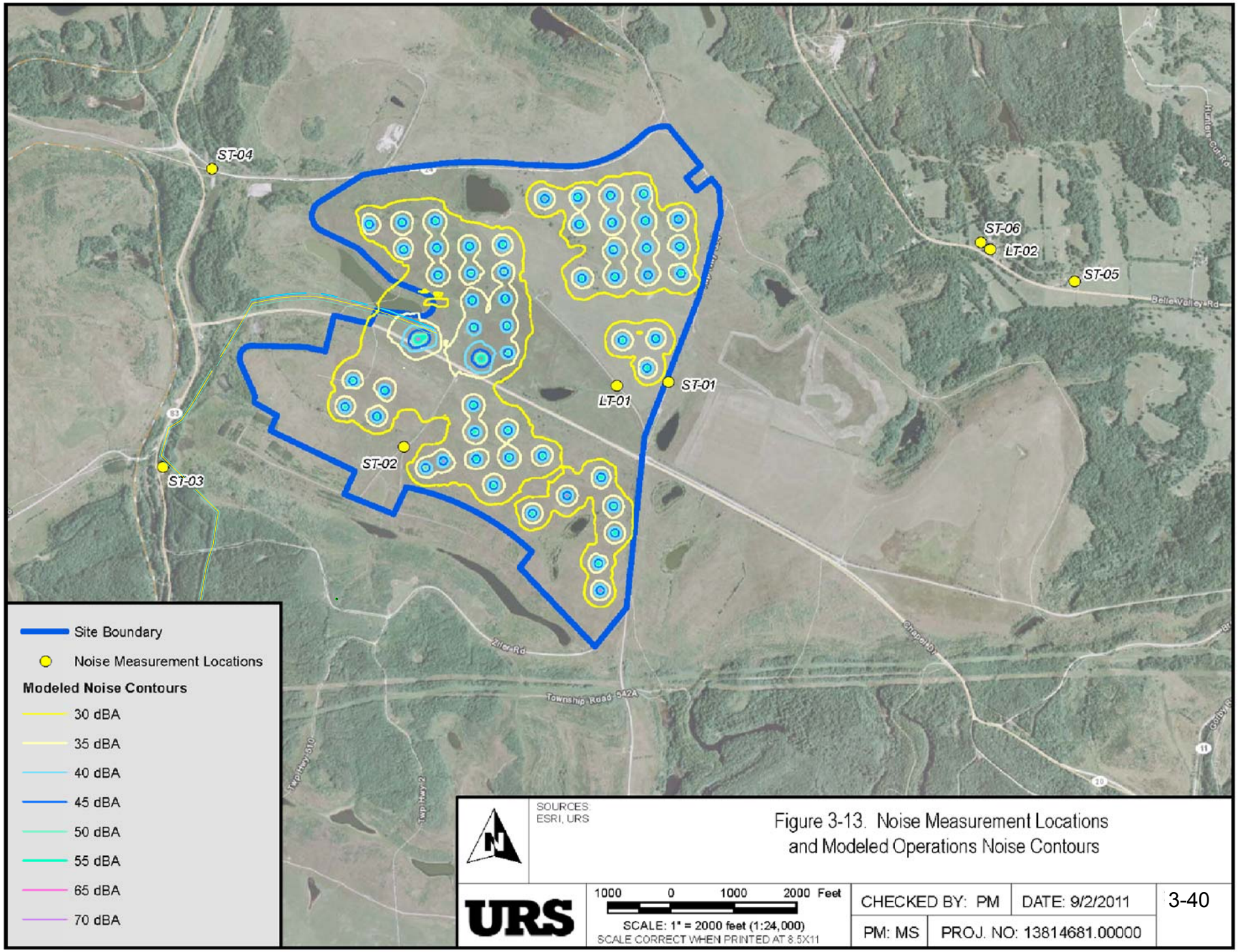

Figure 3-13. Noise Measurement Locations and Modeled Operations Noise Contours

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