4906-4-04 Project Area Selection and Site Design

(A) SITE SELECTION PROCESS

(1) Description of Study Area

GPS has extensive experience in understanding energy markets and locations for potential electricity demand. Research began in October 2015, focused on the potential future closure of several thousand MW of aging, and financially and environmentally challenged coal-fired power plants throughout the 13-state PJM system. Within Ohio alone, 10,285 MW of coal-fired generation has closed. Retirements have continued, with PJM currently identifying 30,718 total MW retired since 2003. Of these, more than 5,000 MW are in the AEP transmission zone, including the Ohio-based plants at Muskingum River and Picway.[2] In addition, almost 7,000 MW within PJM have requested deactivation by the end of 2020.[3]

(2) Maps of Evaluated Alternate Sites

Within the PJM region, several states were considered by GPS for development of a new electric generating facility, including Pennsylvania, Maryland, Virginia, Indiana, and Ohio. Capacity needs, transmission constraints, and pricing structure were considered as well as other economic factors and the complexity and anticipated timeline associated with applicable regulatory processes. GPS focused on southeast Ohio and southwest Pennsylvania due to the available electric and gas infrastructure as well as limited previously announced competition in the area. Abundant gas supplies from Utica and Marcellus shale along with numerous natural gas

[2] PJM. *Generator Deactivations (as of December 2, 2016).* Retrieved from http://www.pjm.com/planning/generation-deactivation/gd-summaries.aspx.
[3] PJM. *Future Deactivations (as of December 2, 2016).* Retrieved from http://www.pjm.com/planning/generation-deactivation/gd-summaries.aspx.

transmission pipelines were a major consideration. Figures 04-1A and 04-01B illustrate the areas considered within the PJM region.

(3) Siting Criteria

Careful site evaluation was undertaken to determine suitability for the proposed Facility. In addition to the need for new generation, GPS considers the following criteria in selecting and evaluating sites:

- Robust electrical connection on site;
- Proximity of adequate and competitive natural gas supply;
- Committed widespread community support;
- Proximity to neighbors and sensitive receptors;
- Adequate site size;
- Compatible zoning and land use;
- Water supply and wastewater discharge alternatives;
- Strong transportation network; and
- No environmental fatal flaws.

(4) Process for Identifying the Proposed Site

Potential locations within southeastern/eastern Ohio were considered. As sites were identified, they were evaluated as to whether they met the minimum siting criteria identified above. A number of sites were considered that met some, but not all, of the identified and required attributes. One site was rejected once it was learned that a competitor had recently applied to PJM for a nearby interconnection. Another site was rejected after meeting with community officials and learning that County Commissioners would be "neutral at best" toward the project. A third site was rejected when it was learned that the electrical lines were not, in fact, part of the PJM

system. A fourth site was rejected when it was determined the land was held in a 100-year family trust.

The selected Facility Site has significant utility infrastructure on site. AEP's 765-kV power lines and the REX interstate natural gas pipeline are located on the property. The site is relatively flat, which is difficult to find, with water and wastewater connections nearby. The property is bounded by I-77 to the east and a rail line to the west. The rail is used for transporting sand and gravel to an adjacent stone supplier located south of the Facility. The unincorporated Valley Township in Guernsey County does not have zoning and land use ordinances, however, GPS met with numerous community leaders to determine if a power project would be something they would support and the answer was an unwavering "yes." The infrastructure, surrounding land use and businesses, and positive response from Guernsey County and Valley Township leaders support the selection of the Facility Site as compatible for use by an electric generating facility.

(5) Factors in Selecting the Proposed Site

The Facility Site was one of the locations identified by GPS as suitable for the proposed development. Evaluation of key characteristics that would indicate suitability was undertaken to determine feasibility of the Facility in this location. The number one draw was the significant electric and gas infrastructure on site. The area had no zoning and land use restrictions; this would allow a power plant to be permitted without the need for additional local approvals. Overwhelming community support and the community leaders' desire to have the project was valuable and encouraging. Water, wastewater, and other environmental issues were evaluated and passed the fatal flaw analysis.

(B) FACILITY LAYOUT DESIGN

With the results of these independent studies confirming the Facility Site as favorable for the proposed Facility, GPS continued with the more detailed environmental and other studies, as well as Facility engineering design, to support the OPSB Application for the Facility.

(1) Constraints Map

Figure 04-2 provides constraint mapping completed for the Facility.

(2) Facility Layout and Alternatives Considered

As illustrated in Figure 04-2, known features on the Facility Site and in the surrounding area were considered when designing the Facility layout. Features considered included: transmission lines; natural gas pipelines; zoning information (not available for this property); nearby sensitive land uses (i.e., schools, parks, residences); transportation corridors; and mapped wetlands and streams. Formal wetland delineation was conducted subsequent to the selection of the Facility Site. As seen in Figure 04-2, the Facility was designed to minimize impacts on wetlands and other natural resource areas.

Selection of equipment depended primarily on negotiations with vendors, with consideration given to the air emissions, noise emissions, and overall dimensions of the proposed equipment, in addition to performance and efficiency. GPS's extensive experience with these type of power generation facilities allowed for a thorough evaluation and selection of the proposed Facility equipment.

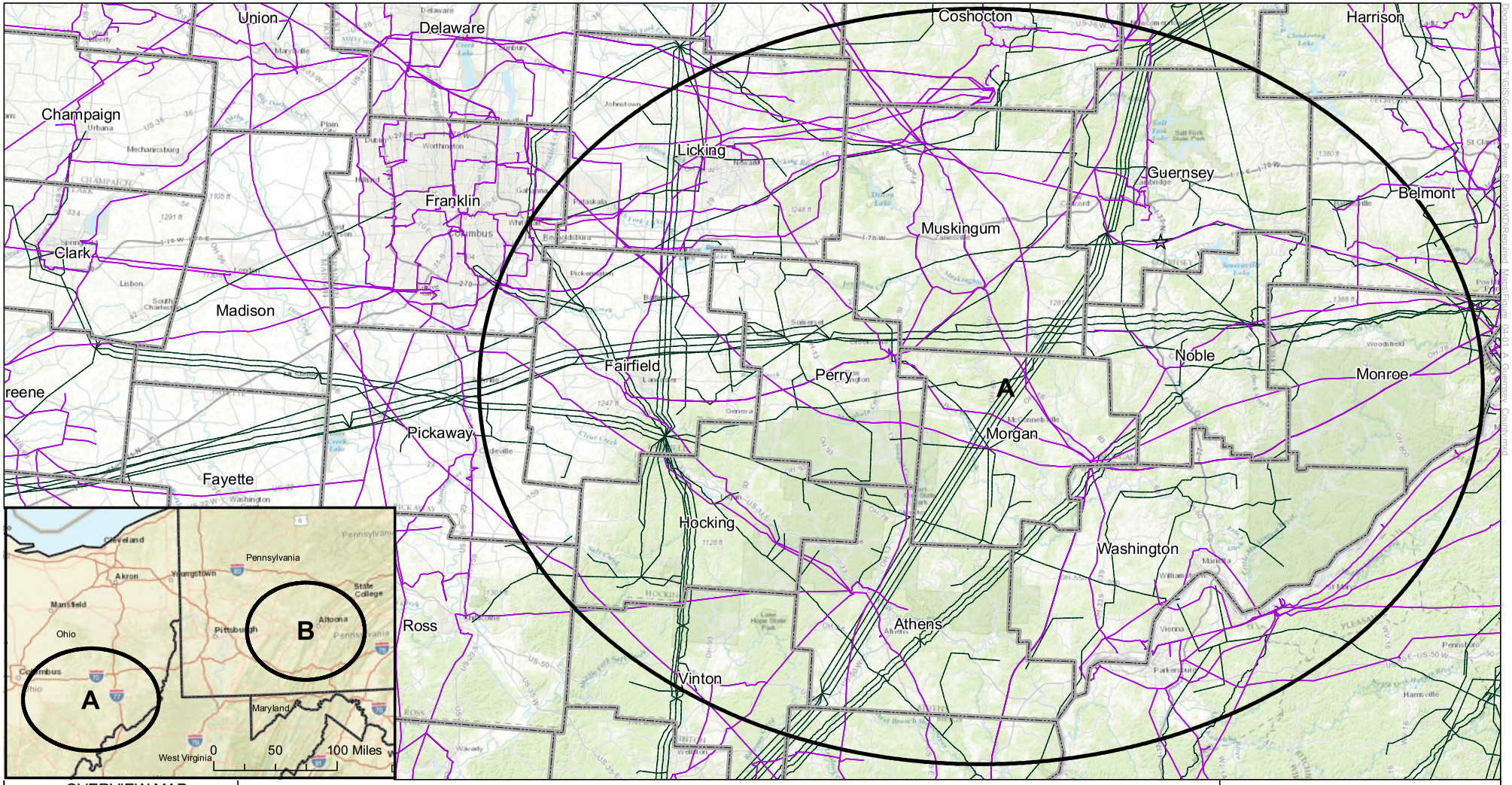
(3) Comments Received

GPS held a public informational meeting for area residents and other interested parties at the Meadowbrook High School in Byesville, Ohio, on the evening of January 25, 2017. Approximately 50 members of the public were in attendance, as well as members of the OPSB staff. Comments received during the meeting included several inquiries regarding potential

construction jobs as well as expressed general interest in the Facility location and surroundings. Other inquiries during the evening were related to the start of construction and the overall Facility schedule. One area resident who lives approximately three miles from the proposed Facility expressed concerns over the potential to hear noise from the Facility and was concerned about lighting from the Facility. The presentation materials that were available at the meeting are provided in Appendix C.

Section 4906-4-04: Figures

- **Figure 04-1A and B: Site Selection Attributes**
- **Figure 04-2: Site Selection Constraints**

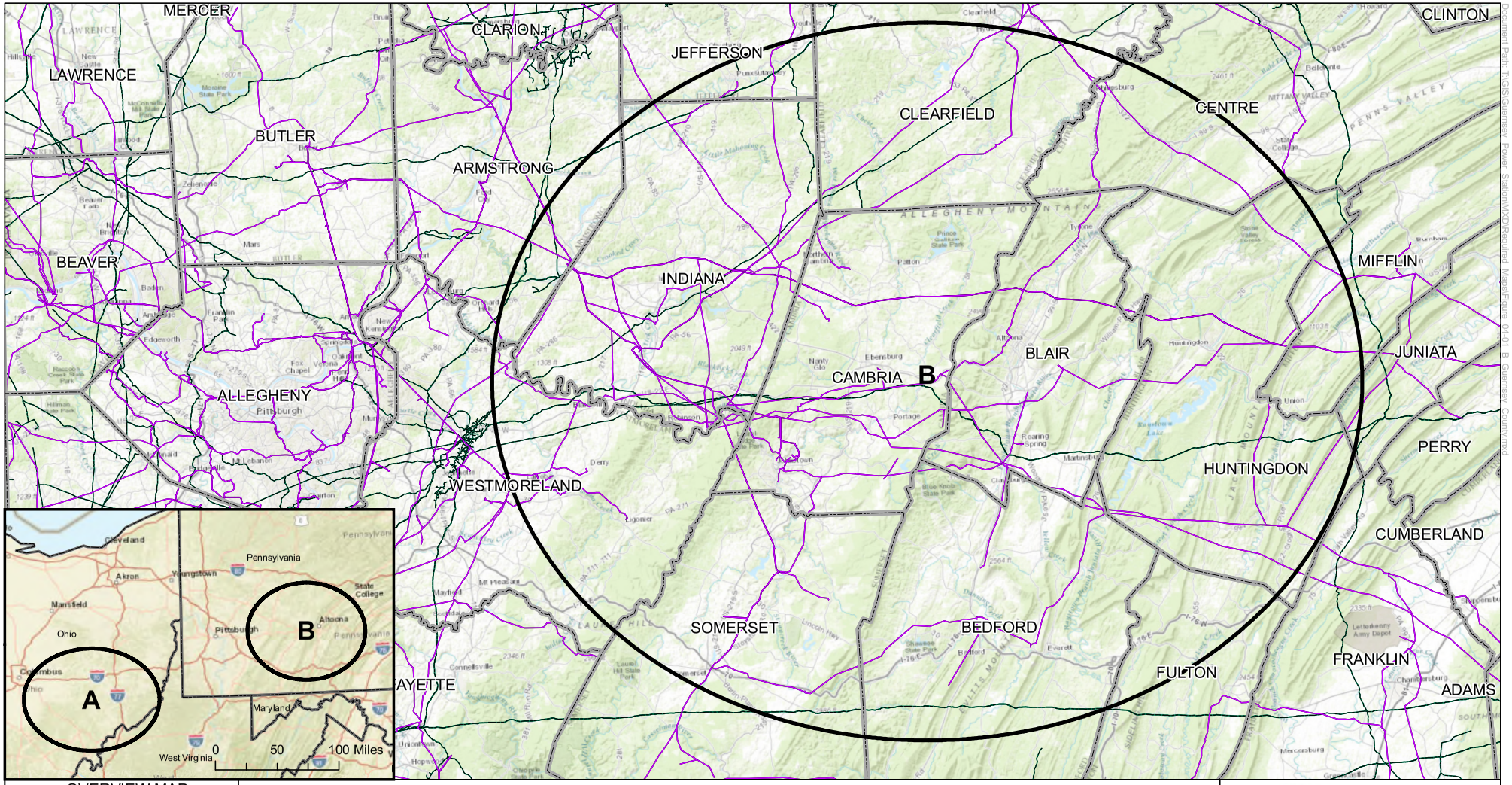


Guernsey Power Station

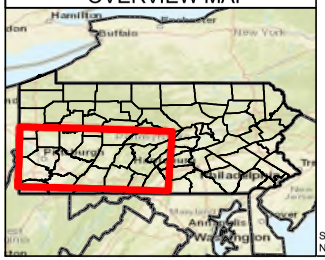
Figure 04-1 A
Guernsey Power Station

Site Selection Attributes

Guernsey County, Ohio



OVERVIEW MAP



Legend

- Areas of Investigation
- County Boundary
- Transmission Line
- State Boundary
- Natural Gas Pipeline

0 10 20 Miles

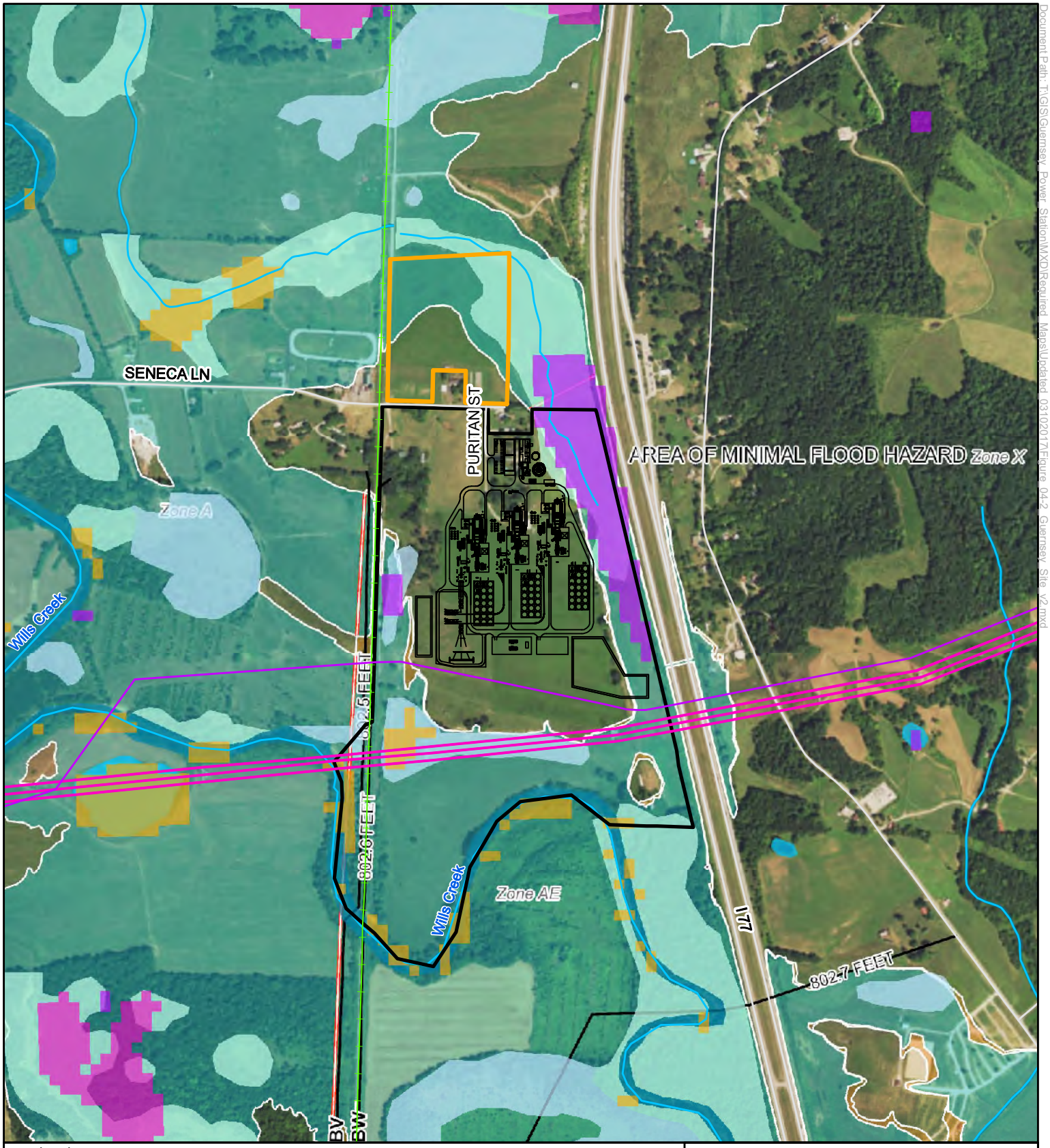
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo

Guernsey Power Station

Figure 04-1 B
Guernsey Power Station

Site Selection Attributes

Guernsey County, Ohio



Legend

- Facility Site
- Proposed Laydown/Parking
- Facility Site Layout
- Stream/River
- Roads
- Railroads
- AEP 765-kV Krammer-Vassel Transmission Line
- REX 42-inch Diameter Natural Gas Pipeline

OWI Wetland Type

- Open water
- Shallow marsh (emergent woody veg. in water < 3 ft.)
- Shrub/scrub wetland (emergent woody veg. in water < 3 ft.)

NWI Wetland Type

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Riverine

Flood Hazard Zones

- 1% Annual Chance Flood Hazard

Sources: Streams/Waterbodies - NHD, Wetlands - OWI/NWI, FEMA - NFHL, Roads - OGRIP LBRS, Railroads - Ohio DOT TIMS, Transmission/Gas Lines - Adapted from Ventyx data

0 500 1,000 Feet

Guernsey Power Station

Figure 04-2
Guernsey Power Station

Site Selection Constraints

Guernsey County, Ohio

4906-4-05 Electric Grid Interconnection

(A) INTERCONNECTION TO THE REGIONAL ELECTRIC POWER SYSTEM

In order to accommodate the Facility's interconnection, and AEP's 765-kV Kammer-Vassell circuit, a new switching substation is required to break the existing line and inject power generated by the Facility. The proposed location of the substation will be within the Interconnection Property, a parcel of land located immediately south of the Facility Site and north of Clay Pike Road. The Interconnection Property will be accessed via an easement along an existing private roadway from Clay Pike Road.

Power leaving the Facility generators will be "stepped up" to 765 kV prior to being conveyed. Power will be generated in units of approximately 23.0 kV, and each unit will have a generator step-up transformer from 23.0 kV to 230 kV. The 230-kV lines will merge in the Facility electrical yard. GPS will own four auto transformers that will boost the power from 230 kV to 765 kV within the switchyard and a common line will be routed south to the new switching substation on the Interconnection Property.

The proposed substation and appurtenant facilities will be the subject of a separate OPSB filing.

(B) INTERCONNECTION REQUEST

(1) Feasibility Study

Two system interconnection studies have been initiated with PJM, totaling 1,650 MW of input to AEP. The initial PJM Feasibility Study (Queue AB2-067) for 1,100 MW was completed in September 2016. An increase of 550 MW in plant size was applied for in a second interconnection request (Queue AC1-044) and the Feasibility Study report for this increase was issued in March 2017. Both Feasibility Studies are provided in Appendix D. The System Impact

Study (SIS) report for the initial Facility size is expected to be issued in March 2017. GPS expects PJM's evaluation of the additional capacity to catch up to the initial study in the Facilities Study phase in September 2017. GPS is requesting conditional approval of the full output of the Facility, pending submittal of the SIS for the additional MW to the OPSB.

(2) System Impact Study

The SIS was initiated with PJM in September 2016. The SIS for AB2-067 will be completed in March 2017. This information will be provided to OPSB staff once available. The reports will also be available on-line on the PJM website (http://pjm.com/planning.aspx).

4906-4-06 Economic Impact and Public Interaction

(A) OWNERSHIP

GPS will develop, construct, own, and operate the proposed Facility. GPS has an option to purchase several contiguous properties on which it proposes to construct the Facility. GPS will own all the equipment, structures, and on-site improvements associated with the Facility. The Facility Site is adequately sized to build the Facility. Approximately 15 acres north of Seneca Lane is available for construction laydown and parking, along with approximately 9.8 acres within the Facility Site. GPS also has an agreement to purchase a portion of the 135-acre parcel south of Wills Creek, which will be used for the proposed for the Facility's electrical interconnection and switchyard, located south of the Facility Site (the Interconnection Property), to be addressed in a separate filing with the OPSB.

(B) CAPITAL AND INTANGIBLE COSTS

(1) Estimated Capital and Intangible Costs

Table 06-1 presents cost information using Generally Acceptable Accounting Principles accounting format.

TABLE 06-1
ESTIMATED CAPITAL AND INTANGIBLE COSTS

Description	Cost ($1,000)
Engineering, Procurement, Construction	1,352,000
Transmission/Interconnection Costs	50,000
Facility Development Costs	19,000
Land & Site Preparation	29,000
Total ($880 per kW [a])	**1,450,000**
[a] kW = kilowatt	

(2) Capital Cost Comparison

Within the recent past, a number of large scale combined-cycle power projects have been successfully financed by non-utility entities throughout PJM. Due to multiple factors including unique local economic conditions, specific facility modifications, and timing of equipment purchases, GPS estimates that the PJM regional range of combined-cycle combustion turbine costs would vary from $1,075/kW to $987/kW. The U.S. Energy Information Administration[4] reports cost of advanced natural gas combined-cycle units in Ohio at $1,073 per kW. Therefore, the Facility's all-in capital cost (including financing-related costs) of $879 per kW is clearly within the range of similar large-scale combined-cycle plants, and in fact, appears to be one of the lower cost projects.

(3) Present Worth and Annualized Capital Costs Comparison to Alternatives

A capital cost comparison is provided in Section 4906-4-06(B)(2). No Facility configuration alternatives are presently being considered and, thus, no comparison can be developed.

(C) OPERATION AND MAINTENANCE EXPENSES

(1) Estimated Annual Operation and Maintenance Expenses

GPS estimates that the fixed and variable annual operation and maintenance (O&M) expense for the Facility's partial calendar year in operation (2020) will be approximately $8.75 million. Commercial operation is currently expected to occur in the third quarter of 2020, so that expenses for that year reflect only 3 months of operation. In 2021, the Facility's first entire calendar year in operation, the estimated O&M expense will be approximately $35 million. However, neither

[4] U.S. Energy Information Administration, Capital Cost Estimates for Utility Scale Electricity Generating Plants. November 2016. https://www.eia.gov/analysis/studies/powerplants/capitalcost/pdf/capcost_assumption.pdf.

of these expense estimates includes the cost of fuel required by the Facility. Using current dispatch estimates of 85% available hours in 2020 and 90% in 2021, the sum of all O&M annual expense corresponds to an expected $2.85 per megawatt-hour (MW-hr) and $2.70 per MW-hr, respectively. Due to the unique features of each combined-cycle project, the variable O&M costs – when coupled with the large amount of fixed costs associated with operation – can result in a total O&M value expressed as costs per MW-hr that can vary slightly from location to location.

The amount, and thus cost, of natural gas that will be utilized by the Facility is a function of both the net heat rate and the percentage of the annual hours in a given year that the Facility will be run, or "dispatched." Assuming a 90% annual average dispatch rate and a 2020 delivered gas price of $3.25/million British thermal units (MMBtu), the annual cost of purchasing natural gas, including transportation to the Facility Site, will be approximately $275 million (on a full-year basis).

(2) Operation and Maintenance Expenses Comparison

As discussed in Section 4906-4-06(B)(2), using publicly available data, GPS estimates that annual, non-fuel fixed and variable O&M expenses range from $2.35 per MW-hr to $4.60 per MW-hr, depending in large part on the forecasted plant dispatch, local economic conditions, and specific facility characteristics. With consideration of these influences, the Facility is anticipated to perform well within this given range of expected plant costs.

(3) Present Worth and Annualized O&M Expenses Comparison to Alternatives

An O&M comparison is provided in Section 4906-4-06(C)(2). GPS is not considering any alternative O&M regime or Facility technology configurations at this time.

(D) COST OF DELAYS

Delays in Facility permitting could jeopardize commercialization and GPS's ability to participate in the 2021/2022 PJM Reliability Pricing Model Base Residual Auction and the three Incremental Auctions for the 2020/2021 Delivery Year. Delays of this nature would result in significant costs including:

- Losses in projected energy revenue;
- Losses in capacity revenues;
- Significant PJM Non-Performance Charges associated with PJM Capacity Market Resource Performance Assessments; and
- Potential additional costs to ratepayers due to an inadequate/unreliable regional power supply and compromised grid reliability.

GPS intends to commit to purchasing three "power island" combined-cycle generating units from GE that are the primary power generation equipment within the Facility. This "power island" package, including the three CTGs, three HRSGs, and three STGs, requires a deposit in excess of $20 million and significant cancellation penalties. The fabrication of these units will need to commence in late 2017; however, this significant expenditure would not occur until OPSB approval is certain. Any delay in the OPSB process results in delays in commencing manufacturing of the "power island" equipment, including loss of position in the queue which would be significant and potentially delay the Facility by months.

Delay also adds unnecessary Facility costs such as: storage and double-handling costs for major equipment; interest costs on funds used to purchase major equipment; higher risk for increases in cost of construction debt; and cost increases associated with general construction.

(E) ECONOMIC IMPACT

(1) Annual Total Present Worth of Construction and Operation Payroll

Facility construction is scheduled to take place during the period from January 2018 to September 2020 (33 months). An estimated $354 million in construction labor income will result in Guernsey and the surrounding counties during this period, including secondary and tertiary multiplier impacts, and an additional $96 million in other parts of Ohio. Annual operations labor income from the Facility is estimated at $9.8 million per year for Guernsey and surrounding counties, and $11.7 million for Ohio as a whole. See Appendix E for additional economic analysis. GPS has not hired any workers at this time.

(2) Construction and Operation Employment

The number of employees during Facility construction will vary on a monthly basis in accordance with the construction schedule; the maximum number at the Facility Site at any one time is estimated to be in the range of 450 to 650, with these jobs being primarily supported by craftsmen in Guernsey and the surrounding counties (see the Economic Assessment in Appendix E). A significant number of the construction workers will come from Guernsey and the surrounding counties with the remainder from other counties within Ohio or neighboring states. Once operational, the Facility will employ approximately 25 employees and have impacts that support an additional 115 jobs in the Guernsey County region and a total of 180 jobs statewide. GPS will seek to use local labor where practical.

(3) Increase in Local Revenue

GPS has begun and will continue discussions regarding tax payments with local economic development officials, the Rolling Hills School District, and Valley Township.

(4) Economic Impact on Local Commercial and Industrial Activities

Construction and operation of the proposed Facility will have a substantial positive effect on local commercial and industrial activities. The Facility will affect local commercial and industrial activities both directly and indirectly. Financial benefits will be associated with direct purchases related to construction activities, and also with indirect purchases.

The major equipment that comprises the Facility, such as the GE combustion turbines, will be purchased from outside the local region. However, the local commercial and industrial communities are anticipated to benefit from direct purchases that will include construction materials and general supplies purchased from local vendors. The same communities will also benefit indirectly from the expenditures by operating personnel for locally supplied goods and services.

GPS has retained an independent firm, Economic Development Research Group, to analyze both the direct and indirect economic impact of building and operating the planned Facility (Appendix E). Key findings of this study were:

- Construction of the Facility is estimated to generate over $610 million in total economic activity in Guernsey County and the surrounding region, and over $950 million in total economic activity in the State of Ohio. This will produce $16.3 million in additional state and local tax revenues (not including property taxes) in Guernsey County and the surrounding region, and a total of $33.7 million in the state of Ohio.
- Construction of the Facility is anticipated to create over 2,500 average annual jobs during the 33-month construction period in the Guernsey County region. Construction of the Facility will increase the forecasted rate of job growth in the Guernsey County region during the construction phase.

- Once operational, the Facility will result in $77.2 million annually in new business activity in a wide variety of industries in the Guernsey County region. Operation will increase state and local (non-property) tax revenues by almost $1 million annually in the Guernsey County region.
- During operation, the Facility will employ approximately 25 full-time workers, and an additional 115 indirect and induced jobs, for a total of 140 jobs in the Guernsey County region; 40 additional jobs will be created elsewhere in Ohio, resulting in a total of 180 additional Facility-related jobs statewide.

These economic impacts do not include the effect of local property tax payments that will be made by the Facility.

(F) RESPONSIBILITY TO THE PUBLIC

(1) Public Information Program

Facility-related work within the community has been on-going since early 2016, when informal discussions with interested parties began while exploring potential sites. GPS has developed a number of Facility-related presentations for various meetings, and has provided information to the local newspapers and community leaders regarding the Facility status. GPS has created a company website as a means of keeping the community informed and is committed to continuing local outreach activities.

On December 20, 2016, a pre-application conference meeting was held with the OPSB Staff in Columbus, Ohio to introduce GPS and the Facility. On January 25, 2017, GPS held a public information meeting as required by Ohio Administrative Code (OAC) Section (§) 4906-5-08. The meeting was properly noticed in the local newspapers (Appendix C). Representatives for the Facility including GPS personnel and consultants staffed the meeting, which included a display of

Facility information and an opportunity to speak one-on-one with GPS representatives. In addition, GPS and its representatives have held numerous meetings with local public officials and have spoken with proximate neighbors to discuss the Facility.

During the Facility's construction phase, an on-site construction manager will be available to respond to local issues. The policies and procedures outlined in the Complaint Resolution Program, provided in Appendix F, will be implemented during the construction of the Facility. Facility representatives will take a proactive approach to maintain ongoing, open communications with the Guernsey County Commissioners, Valley Township Trustees and the local community. All complaints will be addressed in a timely manner, with information sought to correct the root cause, as appropriate. Once the Facility is operational, the Complaint Resolution Program will be updated accordingly.

GPS will continue to engage in active public outreach prior to, during, and after Facility construction. Once the Facility is in commercial operation, GPS intends that its local GPS personnel will maintain a high level of community involvement.

Once operational, GPS will, to the extent possible, host and provide complimentary tours of the Facility for groups and/or individuals upon request. This is anticipated to be an excellent tool for educating the public about electric generation technology, and is consistent with the county's plans for offering education and training for young people interested in careers in the energy field.

(2) Liability Compensation Plans

GPS will carry significant amounts of liability insurance. The Facility will be covered for general commercial liability insurance and automobile liability insurance during the Facility's construction and operation.

(3) Impact to Surrounding Infrastructure

The proposed Laydown and Parking Area, located just north of the Facility Site along Seneca Lane, will be used for equipment and material storage as well as construction worker parking. The proximity of the Laydown and Parking Area to the Facility Site will minimize construction traffic on public roadways. Once parked at the Laydown and Parking Area workers will cross Seneca Lane to access the Facility Site.

No upgrades to local roads or bridges are currently expected to be necessary for transportation of construction vehicles and Facility equipment; however, infrastructure will be specifically evaluated prior to delivery of heavy equipment and appropriate upgrades or other measures will be implemented in consultation with Guernsey County and Valley and Jackson Townships. Other industrial uses are located along Clay Pike Road and Marietta Road, the local roadways that provide access to the Facility Site. These roadways are expected to be capable of supporting traffic associated with the Facility and/or of being readily modified for this temporary use.

Once in operation, the staff required to run the Facility is expected to be approximately 25 employees, working across three shifts. This additional volume on the existing transportation infrastructure is not expected to cause a significant impact.

(4) Transportation Permits

The Facility Site is in close proximity to a well-established transportation network. I-77 is adjacent to the Facility Site, and I-70 is located 4.25 miles north of the Facility Site; these major roadways provide direct access to the Facility Site vicinity for delivery of equipment and supplies.

It is anticipated that the Facility will cause short-term increases in traffic on routes leading the Facility Site due to deliveries of equipment and materials during construction. Workers

arriving and departing during construction will also increase traffic. Some traffic management during the construction phase may be necessary in the immediate vicinity of the Facility Site to ensure safe and efficient maintenance of existing traffic patterns and usages. As applicable, coordination with state and local agencies will be undertaken to plan the schedule and route of equipment deliveries, and all applicable transportation permits will be obtained. A Traffic Management Plan is provided as Appendix G.

(5) Plan for Decommissioning

The Facility is expected to be in place and providing efficient energy throughout its operating life. However, at the time the Facility is no longer planned for operation, GPS will work closely with Guernsey County and Valley Township officials towards retaining infrastructure that could be utilized for another productive use, while removing equipment no longer required.

Equipment to be removed from the Facility Site will be evaluated by a professional to determine the extent to which individual components or materials can be recycled or reused in another location. Once all useful equipment and material is salvaged, other structures to be removed will be demolished and disposed of in accordance with federal and state law. Appropriate dust control and other measures will be utilized to protect air quality and minimize the potential for offsite impacts.

It is anticipated that subsurface utilities and infrastructure will not be removed, but will remain in place for potential future use. Graded features, such as stormwater management facilities, will also remain in place for modification and/or use in the future. During decommissioning activities, best management practices (BMPs) such as silt fencing or silt socks will be employed to prevent inadvertent erosion and sedimentation or impact to surface waters or

wetlands. Once all equipment to be removed is no longer present, soil stabilization measures suitable to the remaining features will be employed (e.g., seeding).

Access roads and electrical utilities are anticipated to remain in place pending direction from local officials and PJM, respectively. Should environmental impacts be anticipated that would result in any mitigation, appropriate state and/or federal approvals will be obtained prior to commencing the activity for which the approval or mitigation activity is required.

GPS believes that the salvage value of equipment to be removed from the Facility Site when decommissioned will fully offset the cost of removal such that no additional financial assurance is required. A detailed timetable will be established prior to implementation, and will focus on logistics that would support obtaining maximum reuse and recycling of equipment and components.

(A) COMPLIANCE WITH APPLICABLE REGULATIONS

This section provides an assessment of the environmental effects, specifically relating to air quality, water quality, and waste generation/disposal associated with the proposed Facility as well as aviation regulations. Under some headings of this section, reference is made to separate documents that have been filed to meet federal, state, and local regulations. GPS believes that it has met, or will meet, all the appropriate environmental requirements for the proposed Facility.

(B) AIR QUALITY

(1) Preconstruction

(a) Ambient Air Quality

Ambient (outdoor) pollutant concentrations are measured at monitoring stations owned and operated mainly by state environmental agencies. Data collected from air quality monitoring sites are used by United States Environmental Protection Agency (USEPA), in part, to assign the attainment status of an area with respect to the NAAQS. USEPA has developed NAAQS for six air contaminants, known as criteria pollutants, for the protection of public health and welfare. These criteria pollutants are SO_2, PM, nitrogen dioxide (NO_2), CO, ozone (O_3), and lead (Pb). PM is characterized according to size. PM having an effective aerodynamic diameter of 10 micrometers or less is referred to as PM_{10}, or respirable particulate. PM having an effective aerodynamic diameter of 2.5 micrometers or less is referred to as $PM_{2.5}$, or fine particulate. Every area of the United States has been designated as "attainment," "unclassifiable," or "nonattainment" with respect to the NAAQS. In areas designated as attainment, the air quality with respect to the pollutant is equal to or better than the NAAQS. These areas are under a mandate to maintain (i.e.,

prevent significant deterioration of) such air quality. In areas designated as unclassifiable, there are limited air quality data, and those areas are treated as attainment areas for regulatory purposes. In areas designated as nonattainment, the air quality with respect to the pollutant is worse than the NAAQS. These areas must take actions to improve air quality and achieve attainment with the NAAQS within a certain period of time. The Facility Site is in an area presently classified as "unclassifiable/attainment" for all criteria pollutants.

In addition, the current ambient air quality monitored concentrations (i.e., background) are used in the air quality dispersion modeling analysis of the Facility; they will be added to the model-predicted concentrations for comparison with the NAAQS. As defined by the Ohio Environmental Protection Agency (Ohio EPA), background air quality includes pollutant concentrations due to natural sources, mobile sources, nearby sources other than the one(s) under consideration, and unidentified sources. Background air quality is defined as the ambient air pollutant concentration that is present as a result of these existing sources, not including the Facility.

Background ambient air quality concentrations were determined from the closest, representative, available monitoring stations to the Facility. Selection of monitoring sites considered proximity to the Facility Site, and comparison of the monitoring site environment to the environment surrounding the Facility Site.

For the Facility Site, monitoring data from the Ohio EPA, the West Virginia Department of Environmental Protection (WVDEP) and the Pennsylvania Department of Environmental Protection (PADEP) were reviewed to determine representative monitoring sites and ambient background concentrations. Table 07-1 lists the selected monitoring

stations, and Table 07-2 summarizes the background data and compares the concentrations to the NAAQS.

TABLE 07-1
BACKGROUND AIR QUALITY MONITORING STATIONS

Pollutant	Station Location	Station Identification
NO_2	Marcellus - Pittsburgh, Pennsylvania Franklin Park, Ohio Beaver Falls, Pennsylvania	42-125-5200 39-049-0037 42-007-0014
CO	Weirton - Marland Heights Elementary - Weirton, West Virginia	54-009-0011
PM_{10}	Brilliant - Brilliant, Ohio	39-081-0001
$PM_{2.5}$	Neale Elementary School -Vienna, West Virginia	54-107-1002
SO_2	Neale Elementary School -Vienna, West Virginia	54-107-1002
O_3	Quaker City - Quaker City, Ohio	39-121-9991

TABLE 07-2
BACKGROUND AIR QUALITY DATA

Pollutant	Averaging Period	Monitored Background Concentration ($\mu g/m^3$)[a]	NAAQS ($\mu g/m^3$)
NO_2	1-hour	52.6[b]	188
	Annual	16.1	100
CO	1-hour	1,145	40,000
	8-hour	916	10,000
PM_{10}	24-hour	45	150
$PM_{2.5}$	24-hour	21.3	35
	Annual	9.4	12
SO_2	1-hour	73.4	196
	3-hour	117.9	1300
	24-hour	29.6	365
	Annual	9.3	80
O_3	8-hour	0.065 ppm[c]	0.070 ppm

[a] microgram per cubic meter ($\mu g/m^3$).

[b] The 1-hr NO_2 modeling analysis does not use this value; it uses 1-hr NO_2 background concentrations that vary by season and hour-of-day.

[c.] parts per million (ppm).

The location of each monitor is generally the closest or in an area that is similar or more industrialized than the Facility Site, which makes the monitoring data conservatively representative. The selected background concentrations for 1-hour NO_2, 1-hour SO_2, and $PM_{2.5}$ (24-hour and annual) are based on three-year average design values. The background values for the other pollutants are based on the maximum measured concentrations across the three years (2013-2015). The short-term ambient NO_2 concentrations may have a diurnal pattern as well as a seasonal variability due to the role of ozone in the NO_x chemistry. Therefore for the 1-hour NO_2 modeling analysis, background concentrations are based on the 3-year (2013-2015) average of the 98^{th} percentile concentration by season and hour-of-day for comparison with the 1-hour NO_2 standard.

Figure 07-1 shows the location of each selected monitoring station and emission sources within 50 kilometers of the Facility.

The following subsections summarize background air quality by pollutant.

Nitrogen Dioxide – Oxides of nitrogen are formed in a combustion process when nitrogen in the air is oxidized to nitric oxide (NO) or NO_2. The NAAQS is specific to NO_2, but NO is oxidized in the atmosphere to NO_2 and, therefore, NO_X is the emitted regulated pollutant. Major sources of NO_X are fuel combustion, including boilers, gas turbines, and motor vehicles, as well as certain chemical processes.

The background concentrations for NO_2 were selected from a monitoring station named Marcellus in the Pittsburgh, Pennsylvania core-based statistical area. Given the monitor's proximity to a major city, this monitor is in a more urban setting than the rural area surrounding the Facility Site. Therefore, the concentrations measured at Marcellus conservatively represent the Facility Site conditions. Data from this site were used for the

annual NO_2 background concentrations, and as the primary site for the 1-hour NO_2 background concentration processing. Missing hourly data were filled in from the Franklin Park, Ohio and the Beaver Falls, Pennsylvania monitoring sites to complete three years of hourly data. Then a 3-year (2013-2015) average of the 98^{th} percentile background concentration by season and hour-of-day is determined and used for the 1-hour NO_2 background concentrations in the modeling analysis (consistent with the USEPA 1-hour NO_2 guidance memorandum dated June 28, 2010).

Particulates – PM_{10} is defined as any liquid (aerosol) or solid substance found in the atmosphere with a diameter equal to or less than 10 micrometers. Common forms of PM_{10} are fly ash, process dusts, soot, and oil aerosols. Industrial processes, electric power generation, fuel combustion, and dust from plowed fields, roadways or construction sites are examples of major sources of PM_{10}. The background concentration for PM_{10} was selected from a monitoring station located in Brilliant, Ohio. This is the closest monitoring site and is in a more densely populated area than the Facility Site; therefore, data from this monitor were determined to represent conservative background concentrations for the Facility Site.

$PM_{2.5}$ is defined as any liquid (aerosol) or solid substance found in the atmosphere with a diameter equal to or less than 2.5 micrometers. Industrial processes, electric power generation, industrial fuel combustion, and dust from plowed fields, roadways or construction sites are examples of major sources of $PM_{2.5}$. The background concentration for $PM_{2.5}$ was selected from a monitoring station located in Vienna, West Virginia. Although the Gifford monitor in Athens, Ohio is slightly closer to the Facility, it is located in a more rural setting than the Facility Site. Therefore, the next closest monitor located in

Vienna, West Virginia – which is in a more densely populated area than the Facility – was selected as having more representative background concentrations.

Carbon Monoxide – CO is produced by the incomplete combustion of carbon-containing fuels, primarily from internal combustion engines. CO is generally an urban pollutant that is produced mainly from mobile sources.

The background concentrations of CO were selected from a monitoring station in Weirton, West Virginia. This is the closest CO monitor to the Facility Site. Although more densely populated than the Facility Site, this monitor was determined to be more representative than the next nearest monitoring site located in Canton, Ohio.

Sulfur Dioxide – SO_2 emissions are primarily produced by the combustion of sulfur-containing fuels. Industrial processes also release SO_2 into the atmosphere, as do forest fires and mobile sources.

The background concentrations of SO_2 were selected from a monitoring station in Vienna, West Virginia. The closest SO_2 monitor is located in Hackney, Ohio. This monitor seems to be impacted by a local source of SO_2 and is not representative of background in the Facility area. Therefore, the next closest monitor location (Vienna, West Virginia), was selected to be more representative of background concentrations for the Facility, yet still conservative because Vienna is a more densely populated area than the Facility Site.

Ozone – Ground level O_3 is considered a secondary pollutant because it is not emitted directly into the atmosphere, but is created by chemical reactions between NO_X and VOC in the presence of sunlight. The closest O_3 monitoring station is in Quaker City, Ohio, an area similar to the Facility Site, and was selected to provide representative background concentrations for the Facility.

(b) Pollution Control Equipment

A review of the air emissions and controls for the proposed Facility is presented below.

Nitrogen Oxides – NO_X is formed in the gas turbine combustion chamber during high temperature gas firing primarily as a result of the reaction between nitrogen and O_2 present in the combustion air. The CTGs will utilize DLN combustors which are integrated within the combustion turbines. The DLN combustion controls NO_X formation by minimizing both the flame temperature and the concentration of O_2 at the flame front.

SCR, a post-combustion chemical process, will be installed in the HRSGs to treat exhaust gases downstream of the CTGs and duct burners. The SCR process will use 19% aqueous NH_3 as a reagent. Aqueous NH_3 will be injected into the flue gas stream, upstream of the SCR catalyst, where it will mix with NO_X. The catalyst bed will be located in a temperature zone of the HRSG where the catalyst is most effective. The mixture will pass over the catalyst and the NO_X will be reduced to nitrogen gas and water. The SCR system will reduce NO_X concentrations to 2.0 parts per million by volume, corrected to 15% O_2 (ppmvdc), or less, with or without duct firing, at all steady-state load conditions and ambient temperatures. A small amount of NH_3 will remain un-reacted through the catalyst, which is called the "NH_3 slip." The NH_3 slip will be limited to 5.0 ppmvdc, or less, at all steady-state load conditions, with or without duct firing, and ambient temperatures.

NO_X emissions will increase during limited periods of startup and shutdown since the DLN combustor does not operate the same way at these loads as it does during steady-state loads. Additionally, the SCR unit is not operational during startup and shutdown when the SCR catalyst is below its minimum operating temperature.

The use of DLN and SCR meets Best Available Control Technology (BACT) for control of NO_X emissions from the CTGs and duct burners.

BACT will also be met for NO_X for the ancillary equipment. The auxiliary boiler will minimize NO_X emissions using flue gas recirculation, low NO_X burners, and clean-burning natural gas as the sole fuel; the natural gas heaters will minimize NO_X emissions using low NO_X burners and clean-burning natural gas as the sole fuel; and state-of-the-art combustion design in both the emergency fire pump and emergency generator engines will minimize NO_X emissions to satisfy BACT.

Particulate Matter – PM emissions result from trace quantities of ash (non-combustibles) in the fuel, trace amounts of PM in the combustion air, and formation of NH_3 sulfate salts from unreacted NH_3 from the SCR system. PM emissions for the CTGs, duct burners, and auxiliary boiler are minimized through the exclusive use of clean-burning natural gas as the sole fuel in conjunction with good combustion practices. A $PM_{10}/PM_{2.5}$ emissions limit of 0.0069 pounds per million British thermal units (lb/MMBtu) without duct burning and 0.0050 lb/MMBtu with duct burning is proposed for each CTG. This level of emissions will be achieved by combusting only commercially available pipeline-quality natural gas in the CTGs. A $PM_{10}/PM_{2.5}$ emission limit of 0.007 lb/MMBtu is proposed for the auxiliary boiler. The use of clean-burning natural gas, in conjunction with good combustion practices, is BACT for control of $PM_{10}/PM_{2.5}$ emissions from the CTGs, duct burners, auxiliary boiler, and natural gas heaters.

State-of-the-art combustion design in both the emergency fire pump and emergency generator engines will minimize $PM_{10}/PM_{2.5}$ emissions to satisfy BACT.

Carbon Monoxide – CO emitted from the CTGs, duct burners, and auxiliary boiler is a product of incomplete combustion of the fuel. An oxidation catalyst system will be located within each HRSG to control emissions of CO. Exhaust gases from the CTGs and duct burners will be passed over a catalyst bed where excess air will oxidize the CO to form CO_2 and water. The oxidation catalyst system will reduce CO concentrations to 2.0 ppmvdc, or less, in the exhaust gas under all steady-state load conditions. The use of oxidation catalyst systems meets BACT for CO from the CTGs and duct burners. CO emissions will increase during limited periods of startup and shutdown due to less efficient combustion at these loads.

BACT for control of CO from the auxiliary boiler and natural gas heaters will be met through good combustion practices; CO emissions will be less than 0.055 lb/MMBtu.

State-of-the-art combustion design in both the emergency fire pump and emergency generator engines will minimize CO emissions to satisfy BACT.

Volatile Organic Compounds – VOCs emitted from the CTGs, duct burners, and auxiliary boiler are products of incomplete combustion of the fuel. The use of an oxidation catalyst system within each HRSG will control VOC emissions from the CTGs and duct burners. Exhaust gases from the CTGs and duct burners will pass over a catalyst bed where excess air will oxidize the VOCs. The oxidation catalyst will limit VOC emissions from the CTGs to 1.0 ppmvdc, or less, without supplemental duct firing and 2.0 ppmvdc, or less, with supplemental duct firing. The use of an oxidation catalyst system is BACT for control of VOC from the CTGs. VOC emissions will increase during limited periods of startup and shutdown due to less efficient combustion at these loads. BACT for control of VOC

from the auxiliary boiler and natural gas heaters will be met through good combustion practices; VOC emissions will be less than 0.005 lb/MMBtu.

State-of-the-art combustion design in both the emergency fire pump and emergency generator engines will minimize VOC emissions to satisfy BACT.

(c) State and Federal Performance Standards

Prevention of Significant Deterioration Review and New Source Review

New major stationary sources of air pollution are required by the Clean Air Act to obtain an air permit before commencing construction. This process is called New Source Review (NSR) and is required whether the new major source or modification to an existing major source is planned for an area where the NAAQS are not being achieved (i.e., nonattainment area) or an area where air quality is better than the NAAQS or cannot be classified (i.e., attainment and unclassifiable areas). NSR for subject sources in attainment areas is referred to as Prevention of Significant Deterioration (PSD) review, whereas NSR for subject sources in nonattainment areas is referred to as Nonattainment NSR. The entire program, including both PSD and Nonattainment NSR permits, is referred to as the NSR program. The USEPA has delegated authority to issue PSD and Nonattainment NSR permits to Ohio EPA. Regulations adopted and administered by Ohio EPA for PSD and Nonattainment NSR are codified in OAC Chapter 3745-31, Permit to Install (PTI) New Sources of Pollution. OAC Chapter 3745-31 provides requirements for obtaining a PTI for industrial processes. The requirements in this chapter incorporate the provisions of the federal PSD and Nonattainment NSR programs as defined in 40 Code of Federal Regulations (CFR) Parts 51 and 52.

The NSR requirements are pollutant-specific. Even though a source may emit many types of air pollutants, only specific pollutants may be governed by the NSR program, depending on the magnitude of the emissions of each pollutant. Moreover, a source may undergo both PSD and Nonattainment NSR permitting if it is located in an area that is designated as attainment for one or more criteria pollutants and nonattainment for the remaining criteria pollutants. Guernsey County, Ohio has been designated as unclassified/attainment for all criteria pollutants. Because the area is designated as unclassified/attainment for all pollutants, only PSD review applies to the Facility.

The PSD program requires that an applicability determination be conducted for any proposed source (either a new source or modification of an existing source) to see if it will be subject to PSD pre-construction review. Three basic criteria must be evaluated when making a PSD applicability determination. These criteria are the magnitude of the emissions for a new or modified source, location in an attainment or nonattainment area, and the pollutants released.

A combined-cycle power generating facility is listed as one of the 28 named source categories under the PSD program and is considered a new major source under the PSD regulations if it has the potential to emit 100 tons per year (tpy) or more (including fugitive emissions) of a regulated air pollutant. The Facility has the potential to emit more than 100 tpy of the regulated pollutants NO_X, $PM_{2.5}$, PM_{10}, CO, and VOC and is, therefore, subject to review for these pollutants under PSD regulations. Once a facility is subject to review under the PSD regulations by exceeding the major source threshold for at least one regulated pollutant, PSD review also applies for each regulated air pollutant that can be emitted at rates greater than its Significant Emission Rate (SER) listed in 40 CFR 52.21

and OAC Rule 3745-31-01(MMMMM). Based on potential emission estimates, the Facility is subject to PSD review for several regulated air pollutants. The air pollutants subject to PSD review and their respective SERs include NO_X (40 tpy), CO (100 tpy), PM_{10} (15 tpy), $PM_{2.5}$ (10 tpy), SO_2 (40 tpy), and VOC (40 tpy), and the regulated non-criteria pollutant H_2SO_4 (7 tpy). The Facility's emissions of Pb are well below its SER (0.6 tpy); therefore, PSD review is not required for Pb emissions.

On April 2, 2007, the United States Supreme Court found that greenhouse gases (GHGs), including carbon dioxide (CO_2), are air pollutants covered by the Clean Air Act. On May 13, 2010, the USEPA issued a rule (called the "Tailoring Rule") that established an approach to regulating GHG emissions from stationary sources under the Clean Air Act, including the NSR regulations. This final rule "tailored" the requirements of the Clean Air Act permitting program to limit which GHG emitting facilities will be required to obtain PSD permits. Under this rule, effective July 1, 2011, PSD permitting requirements would apply to new sources that emitted in excess of 100,000 tpy of GHG emissions as carbon dioxide equivalent (CO_{2e}). However, on June 23, 2014, the United States Supreme Court ruled that GHG emissions alone cannot determine PSD major source status, but that sources otherwise classified as PSD major sources (so-called "anyway" sources) can still be subject to PSD review for GHG if GHG emissions exceed an agency threshold for GHG. USEPA then issued a Policy Memorandum dated July 24, 2014, indicating that it intends to apply a GHG SER threshold for PSD BACT review for "anyway" sources with potential emissions of 75,000 tpy CO_{2e}. The Facility has the potential to emit more than 75,000 tpy of GHG emissions as CO_{2e} and, therefore, is subject to PSD review for GHGs in addition to the pollutants discussed above.

The other significant aspects of OAC Chapter 3745-31 are outlined in the following paragraphs.

OAC Rule 3745-31-06 – Completeness determinations, processing requirements, public participation, public notice, and issuance – This section mandates that a completeness determination be rendered within 60 days of application receipt by Ohio EPA and within 40 days of receiving a written request from the applicant. The director must rule on a permit application within 180 days after the date that the application is deemed complete. The director must notify the public, by advertisement in a local newspaper, of the draft decision to grant or deny the permit and offer an opportunity for the public to comment or request a hearing.

OAC Rule 3745-31-11 – Ambient Air Ceilings and Increments – The emissions increases due to the proposed new source or modification must not cause an ambient air quality impact that exceeds the maximum allowable increment in the area, nor can they cause any exceedance of any NAAQS, which represent the ambient air quality ceilings.

OAC Rule 3745-31-13/OAC Rule 3745-31-14 – Ambient Monitoring Requirements – The director may determine that pre-construction ambient monitoring data is needed for the purposes of determining whether emission of an air pollutant would cause or contribute to a violation of any NAAQS or applicable increment. Existing air quality data in the vicinity of the Facility is sufficient for determining ambient background levels and pre-construction ambient monitoring data is not required.

OAC Rule 3745-31-15 – Control Technology Review – The owner or operator of a new source must employ BACT for each pollutant subject to PSD review.

OAC Rule 3745-31-16 – Impact Analysis – The owner or operator of a new source must conduct an impact analysis to demonstrate that the increase in emissions, in conjunction with all other applicable emission increases and decreases, will not cause an exceedance of any NAAQS or applicable increment.

OAC Rule 3745-31-17 – Additional Impact Analysis – The owner or operator of a new source must provide an analysis of the impairment to visibility, soils, and vegetation that would occur as a result of the emission increases and an analysis of the ambient air quality impact of expected secondary growth in the area.

Other Regulatory Requirements

In addition to the NSR program, other federal and state air quality standards also apply during operation of an air pollutant source. They include federal New Source Performance Standards (NSPS), federal National Emission Standards for Hazardous Air Pollutants (NESHAP), and the Ohio EPA rules codified under the various chapters of OAC Chapter 3745.

40 CFR 60 Subpart KKKK applies to Stationary Combustion Turbines and places emission limits on NO_X and SO_2 from new combustion turbines. The CTGs and duct burners would be subject to this standard. For new combustion turbines firing natural gas with a rated heat input greater than 850 MMBtu per hour, NO_X emissions are limited to:

- 15 ppmvdc; or
- 54 nanograms per Joule (ng/J) of useful output (0.43 pounds per megawatt-hour [lb/MW-hr]).

Additionally, SO_2 emissions must meet one of the following:

- 110 ng/J (0.90 lb/MW-hr) gross output; or

- 26 ng/J (0.060 lb/MMBtu).

The Facility will use an SCR system to reduce NO_X emissions to 2.0 ppmvdc, or less, and pipeline-quality natural gas to limit SO_2 emissions to 0.0015 lb/MMBtu, or less. As such, the Facility will meet the emission limits under Subpart KKKK.

Additionally, the provisions of this Subpart require continuous monitoring of water-to-fuel ratio, but allow for the use of either a 40 CFR Part 60 or Part 75 certified NO_X CEMS in lieu of this requirement. The Facility proposes to use a 40 CFR Part 75 certified NO_X CEMS, which will satisfy this requirement.

40 CFR Subpart TTTT applies to new fossil fuel electric generating units with an output capacity greater than 25 MW; the proposed CTGs and duct burners will be subject to this Subpart. Subpart TTTT limits CO_2 emissions to 1,000 lb/MW-hr gross energy output or 1,030 lb/MW-hr net energy output. The combined-cycle design of the CTGs and duct burners will meet an emission rate of 838 lb/MW-hr of CO_2, without duct firing, at International Organization for Standardization (ISO) conditions[5] well below the applicable limit of this Subpart.

40 CFR 60 Subpart Db is applicable to steam generating units with a maximum input capacity greater than 100 MMBtu/hr and less than 250 MMBtu/hr. The proposed auxiliary boiler has a maximum input capacity of 184.8 MMBtu/hr and is, therefore, subject to 40 CFR 60 Subpart Db. For subject units combusting natural gas with a low heat release rate, such as the auxiliary boiler, NO_x emissions are limited to 0.10 lb/MMBtu. The proposed auxiliary boiler will use low-NO_x combustors to limit NO_X emissions to 0.02

[5] ISO conditions are 59 degrees Fahrenheit (ºF), 60% relative humidity and 14.7 pounds per square inch absolute.

lb/MMBtu. As such, the Facility will meet the applicable emission limits under Subpart Db. The standard also requires a CEMS for monitoring NO_X emissions; the Facility will install a NO_X CEMS in accordance with the standard.

40 CFR 60 Subpart Dc applies to steam generating units with a maximum input capacity greater than 10 MMBtu/hour and less than 100 MMBtu/hour. Steam generating units, as defined under this standard, include a device that combusts fuel to heat water or any heat transfer medium. The natural gas heaters will heat a water bath and have a maximum heat input of about 15 MMBtu/hour each; therefore, the natural gas heaters will be subject to 40 CFR 60 Subpart Dc. Subpart Dc does not impose any emission standards on natural gas-fired boilers, but requires that records be maintained regarding the amount of fuel burned on a monthly basis.

40 CFR 60 Subpart IIII is applicable to owners and operators of stationary compression ignition (CI) internal combustion engines that commence operation after July 11, 2005. For the Facility, this rule applies to the emergency generator and emergency fire pump engines. For model year 2009 and later, fire pump engines with a displacement less than 30 liters per cylinder and an energy rating between 300 and 600 horsepower, Subpart IIII provides the following emission limits:

- 4.0 grams per kilowatt-hour (g/kW-hr)(3.0 grams per horsepower-hour [g/hp-hr]) of VOC + NO_X
- 3.5 g/kW-hr (2.6 g/hp-hr) of CO
- 0.2 g/kW-hr (0.15 g/hp-hr) of PM

The Facility will install a fire pump engine that is certified to meet these emissions standards.

To comply with Subpart IIII, the emergency generator engines must meet the emission standards for new non-road CI engines (Tier 2 or 3). Engines with a model year 2006 or later with a power rating of 560 kW (750 horsepower) or greater must meet the following Tier 2 limits:

- 6.4 g/kW-hr (4.8 g/hp-hr) of VOC + NO_X
- 3.5 g/kW-hr (2.6 g/hp-hr) of CO
- 0.2 g/kW-hr (0.15 g/hp-hr) of PM

The Facility will install two emergency generator engines, each rated at 1,500 kW, which meet the Tier 2 standards.

There are no NESHAP regulations under 40 CFR Part 61 that are applicable to the Facility's operations. However, the NESHAP regulations under 40 CFR 63 are applicable to certain facility source types. The USEPA has promulgated a variety of standards for each category or subcategory of major sources and area sources of hazardous air pollutants (HAPs) under 40 CFR 63. For the Facility, the potential emissions of any single HAP will not exceed the major source threshold of 10 tpy. In addition, potential emissions of combined HAPs will be less than the major source threshold of 25 tpy. Therefore, under 40 CFR Part 63, the Facility is considered an "area" (non-major) HAP source. The only area source NESHAP that applies to the Facility is the NESHAP under Subpart ZZZZ for Stationary Reciprocating Internal Combustion Engines, which applies to the emergency generator and the emergency fire pump engines. The Facility will comply with the NESHAP Subpart ZZZZ standards, which requires compliance with the NSPS Subpart IIII standards.

The SCR system will use aqueous NH_3 with a concentration no greater than 19% by weight. Aqueous solutions of NH_3 at concentrations below 20% by weight are exempt from the requirements of the USEPA's Accidental Release Prevention Program.

The Facility will be subject to the Acid Rain Program based on the provisions of 40 CFR 72.6(a)(3) because the CTGs are considered utility units with a generating capacity greater than 25 MW under the program definition and do not meet the exemptions listed under paragraph (b) of this Section. As required under this rule, the Facility will submit an acid rain permit application at least 24 months prior to the date on which the affected unit commences operation.

The Cross-State Air Pollution Rule (CSAPR) became effective on January 1, 2015 to reduce annual NO_X emissions, ozone season NO_X emissions, and annual SO_2 emissions from fossil fuel-fired electric generating facilities in 28 states, including Ohio. Similar to the Acid Rain Program, CSAPR implemented a market-based approach for lowering emissions by imposing program wide caps and providing an initial allocation of allowances to existing subject sources. Unlike the Acid Rain Program, CSAPR sets aside a percentage of the allowance budgets to provide to new units. The proposed CTGs and duct burners will be subject to CSAPR and will receive an allocation of annual NO_X, O_3-season NO_X, and annual SO_2 allowances from the new unit set aside account. The Project will comply with CSAPR by utilizing the new unit set-aside allowance allocation with additional allowances obtained in the marketplace, as necessary.

The applicable Ohio EPA rules include OAC Rule 3745-17-07(A)(1), which limits visible emissions from all emission source exhaust stacks to no greater than 20% opacity as a six-minute average; OAC Rule 3745-17-10(B)(1), which limits PM emissions from

gaseous fuel-burning equipment; OAC Rule 3745-18-06(F), which limits SO_2 emissions; OAC Rule 3745-21-08, which limits CO emissions; OAC Rule 3745-21-09, which limits VOC emissions; OAC Chapter 3745-31, which requires a PTI and use of Best Available Technology for emissions abatement; OAC Chapter 3745-77, which requires a Title V Operating Permit; and OAC Chapter 3745-103, which requires an Acid Rain Permit. The emission standards imposed by these regulations are far less stringent than the PSD BACT emission limits.

(d) Required Permits

Federal authority is delegated to the Ohio EPA, and all air permit applications will be submitted to Ohio EPA. The air construction permit, known as the PTI, will serve as the air construction permit and initial operating permit. Since the Facility qualifies as a "Part 70" major source under Title V rules, the Facility will be required to apply for a Title V Operating Permit within 12 months after initial startup (presumed to be first fire).

The following list of air permits is applicable to the proposed Facility:

- *Ohio EPA PTI*: OAC Chapter 3745-31 – PTI New Source of Pollution: OAC Rules 3745-31-01 through -27. The PTI will serve as the submission vehicle for the PSD preconstruction review and construction permit.
- *Title V Permits*: OAC Chapter 374-77 – Title V Permits: OAC 3745-77-01 through -10. The Title V permit will serve as the federally enforceable operating permit for the Facility.
- *Title IV:* Phase II Acid Rain Permit Program (40 CFR Part 72).
- *Mandatory Greenhouse Gas Reporting:* 40 CFR Part 98.

(e) Air Monitoring Stations and Major Source Mapping

Existing ambient air quality data are available for locations in Ohio, West Virginia, and Pennsylvania that adequately reflect ambient conditions at the Facility Site, as confirmed by Ohio EPA. Figure 07-1 provides a section of a United States Geological Survey (USGS) map (1:100,000 scale) showing the location of the Facility Site in relation to the ambient monitoring stations used to identify background levels for the proposed Facility, along with other identified emission point sources in the area.

(f) Compliance Plans

A PTI application for the Facility, including the associated modeling report, is anticipated to be submitted to Ohio EPA in March 2017. This application will address compliance with the requirements identified in Section 4906-4-07(B)(1)(c) and (B)(1)(d). A demonstration has been made that the Facility will meet the range of applicable standards, including demonstrating compliance with NAAQS and PSD increments. A variety of compliance demonstration procedures, in the form of testing, monitoring, recordkeeping, and reporting will be required to ensure operational compliance with all applicable air rules, standards, and permit conditions. These procedures will be performed in accordance with federal NSPS for combustion turbines (Subparts KKKK and TTTT), auxiliary boiler (Subpart Db), natural gas heaters (Subpart Dc), and emergency generator and emergency fire pump engines (Subpart IIII).

(2) Construction

Construction impacts on air quality will consist mainly of the relatively minor emissions from the construction equipment required for Facility Site preparation and from fugitive dust emissions. General construction vehicles (both gasoline- and diesel-powered) and other diesel

engine powered equipment will emit minor amounts of VOC, SO_2, CO, NO_X, and PM. These contaminants are not expected to cause any significant impacts on-site or beyond the Facility Site boundary.

(3) Operation

(a) Description of Air Monitoring Plans

There are no plans to perform any ambient air quality monitoring during operation. However, as noted above, a variety of compliance monitoring procedures in accordance with the federal NSPS for combustion turbines will be implemented to ensure compliance with all applicable rules, standards, and permit conditions.

(b) Estimated Air Concentration Isopleths

The ambient air quality impacts of the Facility were assessed by dispersion modeling, using the USEPA model AERMOD, in accordance with Ohio EPA guidance as summarized in Engineering Guide #69, Air Dispersion Modeling Guidance, and the Air Quality Modeling Protocol submitted to and approved by Ohio EPA. Modeling was performed using five years of hourly meteorological data (2010 through 2014) consisting of surface data and upper air data from Pittsburgh, Pennsylvania. This data set was provided by the Ohio EPA, Division of Air Pollution Control. Impacts of the CTGs were evaluated for a series of ambient temperatures and operating loads spanning the range of anticipated operating conditions, including startup and shutdown (SU/SD).

Consistent with prior Ohio EPA guidance, the two emergency diesel generator engines and emergency diesel fire pump engine are not considered in the short-term modeling analysis due to their intermittent nature of operation and limited total hours of operation. They are considered in the modeling for annual impacts. The Facility modeled

maximum concentrations from the worst-case scenarios are compared to the significant impact levels (SILs) in Table 07-3.

TABLE 07-3
MAXIMUM PREDICTED FACILITY IMPACTS FOR CRITERIA POLLUTANTS

Pollutant	Averaging Time	Maximum Calculated Impact (µg/m^3)	SIL (µg/m^3)
NO_2	Annual – SU/SD	1.03	1
	1-hour – Steady State	20.76	7.5
CO	1-hour	1,608	2,000
	8-hour	51.18	500
PM_{10}	24-hour	2.51	5
	Annual	0.28	1
$PM_{2.5}$	24-hour – NAAQS	1.94	1.2
	24-hour PSD	2.51	
	Annual – NAAQS	0.26	0.2
	Annual – PSD	0.28	
SO_2	1-hour	5.87	7.8
	3-hour	5.27	25
	24-hour	0.80	5
	Annual – NAAQS	0.08	1

Compliance is demonstrated for pollutants with predicted insignificant impacts (less than SILs), and therefore, no additional modeling for these pollutants is necessary. For those pollutants and averaging periods with maximum predicted concentrations equal to or greater than the SIL, a cumulative impact analysis was conducted with other major emission sources in the area, as identified by the Ohio EPA. The results of the cumulative modeling are compared to the PSD Class II increments. In addition, the modeled cumulative impacts are added to ambient monitored background concentrations and the sum compared to the NAAQS. Consistent with Ohio EPA guidance, assessment of the 1-

hour NO_2 NAAQS for the transient CTG SU/SD conditions consists of adding ambient background to the maximum predicted concentrations. As shown in Table 07-4, the cumulative modeling demonstrate compliance with the NAAQS and PSD Increments. The CTG SU/SD condition modeling also demonstrates compliance with the NAAQS, as shown in Table 07-4.

TABLE 07-4
MAXIMUM CUMULATIVE PREDICTED IMPACTS FOR COMPARISON WITH THE NAAQS

Pollutant	Averaging Period	Facility Predicted Impact ($\mu g/m^3$)	Predicted Impacts from Other Sources ($\mu g/m^3$)	Back-ground Conc. ($\mu g/m^3$)	Total Predicted Impact [a] ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Class II PSD Increment ($\mu g/m^3$)
NO_2[b]	1-hour-Steady State	8.35	127.4	35.0	170.8	188	NA
NO_2	1-hour-SU/SD	131.9	NA	39.6	171.5	188	NA
NO_2	Annual-NAAQS	1.03	1.99	16.1	19.1	100	NA
NO_2	Annual-PSD	1.03	1.91	NA	2.95	NA	25
$PM_{2.5}$	24-hour-NAAQS	0.07	2.65	16.7	19.4	35	NA
$PM_{2.5}$	Annual-NAAQS	0.25	0.33	7.8	8.4	12	NA
$PM_{2.5}$	24-hour-PSD	3.79	NA	NA	3.79	NA	9
$PM_{2.5}$	Annual-PSD	0.28	0.003	NA	0.29	NA	4

[a] Total Predicted Impact includes modeled impacts plus background for NAAQS comparison, and only modeled impacts for PSD Increment comparison.
[b] Highest design value concentration to which the Facility impact is significant.

Isopleth plots showing the spatial pattern of calculated Facility concentrations by pollutant and averaging periods are provided in Figures 07-2 through 07-13.

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(c) Potential Failure of Air Pollution Control Equipment

The pollution control equipment consists primarily of the DLN combustors, SCR, and the oxidation catalyst system for the CTGs and duct burners. This equipment has been proven to be reliable, safe, and effective. The DLN combustors are built into the combustion chamber of the CTGs. If a DLN combustor fails, there are detection systems that will notice the failure and automatically initiate shutdown, informing the operator to initiate corrective action. The typical life span of a DLN combustor is based upon the number of starts and hours of operation. The turbine manufacturer recommends periodic maintenance, including inspection of the combustor at specific intervals, which will minimize the risk of in-service failure of any of the components.

Performance of the combustor is also monitored in the Facility computer control system, which will detect degradation in a combustor prior to failure. The NO_X and CO CEMS would also detect changes in emissions.

The SCR and oxidation catalyst systems are integral parts of the HRSG. Steel framework is erected in the combustion turbine exhaust gas path along with the HRSG boiler tubes. This framework holds the catalyst blocks. The oxidation catalyst is a passive device (no reagent required). Aqueous NH_3 is distributed into the exhaust gas stream ahead of the SCR catalyst blocks to achieve the chemical reaction for NO_X reduction. The catalyst blocks for both systems must be periodically replaced. Their life span varies by manufacturer; however, replacements would typically be completed during a regularly scheduled preventative maintenance outage. The NO_X and CO CEMS will detect a deterioration of performance well before a failure of the catalyst could occur. In addition,

the Facility will have a sophisticated computer control system that has the ability to automatically shut down the unit quickly, if necessary.

(C) WATER QUALITY

The proposed Facility design incorporates significant water conservation measures, including the use of ACCs for cooling. Figure 03-5A provides a water balance process flow diagram and Figure 03-5B provides estimated stream flow rates (in gallons per minute) for one 1x1 combined-cycle unit under varying operation scenarios (Cases 1 through 6). The Facility's water use (Facility makeup water or "Stream A" in Figure 03-5B) for the three 1x1 units will range from a total of 345,600 gpd (when operating at 59ºF ambient temperature, 60% relative humidity, with no duct firing and evaporative coolers off, reflected by Case 2) to a maximum of 570,240 gpd (while operating at 92ºF ambient temperature, 60% relative humidity, when the duct burners are firing and the evaporative coolers are on, reflected by Case 3). The Facility's average water use will be on the order of 440,640 gpd.

Wastewater discharge from the Facility is also shown on Figure 03-5B ("Stream "Q"). Wastewater discharge for all three units is anticipated to be range from 306,720 gpd (Case 2) to a maximum discharge of 423,360 gpd (Case 3). Average wastewater discharge for the Facility will be 362,880 gpd.

The Facility will be using water supplied from the Village of Byesville and wastewater will be discharged to Village of Byesville WWTP. As reflected by the letter in Appendix A, adequate services are available to meet the Facility's needs. Additional information regarding the Village of Byesville's water and wastewater services is provided below.

Village of Byesville Water Supply

The Village of Byesville Water Department will supply the Facility with the process and potable water necessary for Facility operations. Per its 2015 Water Quality Report, the Village of Byesville Water Department receives its drinking water from underground mine aquifers. The Village also has an emergency water connection to the City of Cambridge. As noted in Appendix A, the Village's water treatment facility currently produces an average of 1.6 million gallons per day (mgd) of potable water and has a planned filtration capacity of 3.5 mgd in 2017, demonstrating adequate capacity to serve the Facility. Water will be supplied to the Facility by the Village of Byesville via an extension of an existing 8-inch water supply line that currently terminates at the west end of Seneca Lane.

Village of Byesville Wastewater Treatment Plant

The Village of Byesville WWTP, located on Hope Avenue in Byesville, provides treatment for the wastewater collected by the Village's wastewater collection system. The WWTP has a treatment capacity of 1.0 mgd, with an average daily flow of 0.25 mgd. Effluent water is treated through an oxidation ditch and put through a sedimentation process prior to discharge into Wills Creek in accordance with NPDES Permit OH0139700. The Village of Byesville will provide a sanitary sewer line to the Facility Site.

(1) Preconstruction

(a) Required Permits

Prior to construction, the Facility will obtain authorization under a general NPDES permit for stormwater discharges associated with construction (Ohio EPA's Construction General Permit #OHC000004).

(b) Location of Survey Data Sources

No monitoring or gauging stations have been used to collect preconstruction survey data because no new surface or groundwater sources will be utilized by the proposed Facility; therefore, mapping of such stations is not applicable and has not been provided. The Facility intends to utilize water and wastewater services supplied by the Village of Byesville. Any impact associated with on-site stormwater or wastewater discharge will be negligible due to the use of standard engineering design, BMPs, and pretreatment as appropriate to comply with NPDES standards. Stormwater and wastewater flows, therefore, will have no meaningful effect on surface or groundwater quality.

(c) Description of Data Sampling Stations and Reporting Procedures

As there are no monitoring stations, this section is not applicable.

(d) Water Quality of Receiving Stream

Wastewater from the Facility will be directed to the Village of Byesville in accordance with pretreatment requirements and, as discussed in more detail in Appendix B, Facility stormwater discharge will incorporate BMPs and good engineering design practices; as such, water quality impact will not occur as a result of the Facility. Facility stormwater will be held within on-site collection ponds to allow clean stormwater to further settle and to retain peak flows prior to release. This section is, therefore, not applicable.

(e) Water Discharge Permit Information

Construction and operation of the Facility will result in the discharge of stormwater and wastewater. Facility stormwater will be discharged consistent with Ohio EPA and NPDES requirements (as addressed in Appendix B). Process and sanitary wastewaters will

be accepted by the Village of Byesville consistent with pretreatment requirements and in compliance with applicable NPDES standards.

(2) Construction

(a) Location of Water Monitoring and Gauging Stations

No water discharges will be associated with the Facility during construction with the exception of stormwater runoff. Sanitary wastes during construction will be handled using portable units that will be the responsibility of an independent contractor. Therefore, no monitoring or gauging stations are intended to be utilized during construction.

(b) Aquatic Discharges

Discharges are not anticipated to occur in association with construction of the Facility that would influence aquatic resources.

(c) Mitigation Plans

The use of BMPs in accordance with federal and state requirements will ensure that the potential for erosion and sedimentation will be minimized during construction, and that stormwater from the Facility Site will not cause off-site impacts.

(d) Changes in Flow Patterns and Erosion

The Facility Site is essentially flat, and existing drainage patterns will be maintained to the extent possible; therefore, no significant changes in flow patterns are anticipated.

(e) Description of Equipment for Control of Effluents in Receiving Waters

Since no water discharges are anticipated to occur in association with Facility construction, with the exception of stormwater runoff or other discharge allowed under general permit review (e.g., hydrostatic testing), no equipment is proposed.

(3) Operation

(a) Location of Monitoring Equipment

Because the Facility will discharge its process wastewater to the Village of Byesville WWTP in accordance with applicable requirements and BMPs will be utilized, no significant water-related impact is expected. Water monitoring and/or gauging will be implemented as required by the Village of Byesville WWTP in accordance with applicable requirements.

(b) Water Pollution Control Equipment and Treatment Process

Water pollution control equipment to be located at the Facility Site may include: an in-line pH meter; oil/water separator for equipment drains; spill containment areas for bulk chemical storage tanks and unloading areas; and detention pond(s) for stormwater management.

The effluent quality of the process wastewater discharge from the Facility will comply with the Village of Byesville's acceptance criteria supporting its applicable discharge requirements.

(c) Issuance of Required Permits

The Facility may require coverage under a general NPDES permit for operational stormwater, but may obtain a No Exposure Certification if determined applicable. The Facility will incorporate BMPs and operate consistent with its stormwater management

procedures. No NPDES permit will be required for the Facility's wastewater discharge because it will be conveyed to an existing WWTP consistent with pre-treatment requirements; appropriate approvals from the WWTP and Ohio EPA will be obtained for this interconnection, as appropriate.

(d) Quantitative Flow Diagram

The Facility water balance, shown in Figures 03-5A and B, provides specific information with regard to water use and discharge. No runoff or leachate from fuels and solid wastes is anticipated due to the Facility's exclusive use of natural gas as fuel, the limited solid waste storage planned, and the use of an oil/water separator and use of secondary containment where necessary to ensure collection of any incidental materials on-site.

(e) Water Conservation

The proposed Facility design incorporates significant water conservation measures. The Facility will use air cooling technology, reducing water usage by as much as 95% compared to traditional water-cooled plants. In addition, process water will be recirculated through the system and reused to the greatest extent possible prior to blow-down.

(D) SOLID WASTE

(1) Preconstruction

(a) Debris and Solid Waste

The Facility Site is mostly undeveloped, and most of the optioned land was previously used for agricultural purposes. There are two residences and associated structures along Puritan Street and one residence and associated structures along Seneca Lane that will be demolished to make room for the Facility.

(b) Waste Management Plan

All construction and demolition debris will be disposed of in accordance with state and local regulations.

(2) Construction

(a) Debris and Solid Waste

During Facility construction, solid waste will be generated that is typical of normal construction efforts. This includes packing materials, office waste, scrap lumber, metals, cables, glass, cardboard containers, and miscellaneous trash, as well as potentially hazardous substances such as paints or fuels. In addition, during Facility construction and pre-operational cleaning, some solvents and flushing materials will be used. The estimated volume of solid waste generated by construction activities during this time is approximately 2,000 cubic yards.

(b) Waste Management Plan

Solid waste that can be neither recycled nor reused will be stored in on-site containers for disposal. Programs will be developed to ensure that potentially hazardous wastes are identified and separated from normal waste, including segregation of storage areas and proper labeling of containers. All waste will be removed from the Facility Site by licensed contractors in accordance with applicable regulatory requirements and managed in licensed facilities.

(3) Operations

(a) Solid Waste

During Facility operation, generated solid waste is anticipated to consist of office waste, including paper and miscellaneous trash, as well as plant operations wastes such as

spent chemical and lube oil containers, spare parts, packaging, waste oils and oily rags, etc. The estimated volume of solid waste generated during operation of the Facility is 200 cubic yards on an annual basis.

(b) Waste Management Plan

Any solid waste generated during operation of the Facility will be removed from the Facility Site by a licensed hauler.

(4) Licenses and Permits

No new solid waste treatment or disposal facility is proposed as part of this Facility or will be necessitated as a result of the construction or operation of this Facility. All solid waste generated will be trucked off-site by an appropriately licensed contractor. The SCR catalyst will be removed and returned to a catalyst vendor for regeneration, salvage, or disposal. To the extent that minor quantities of materials considered hazardous are generated or disposed, appropriate waste registration will be obtained.

(E) AVIATION

(1) Surrounding Air Navigation Facilities

As shown in Figure 07-14, there is one public airport located within five miles of the Facility Site, the Cambridge Municipal Airport, a public use airport located approximately 3.3 miles north of the Facility Site. One private runway is located approximately 3.4 miles east of the Facility Site in Senecaville. The Cambridge Municipal Airport has one 4,300-foot runway. The small private runway located in Senecaville is a grass airstrip approximately 2,500 feet long.

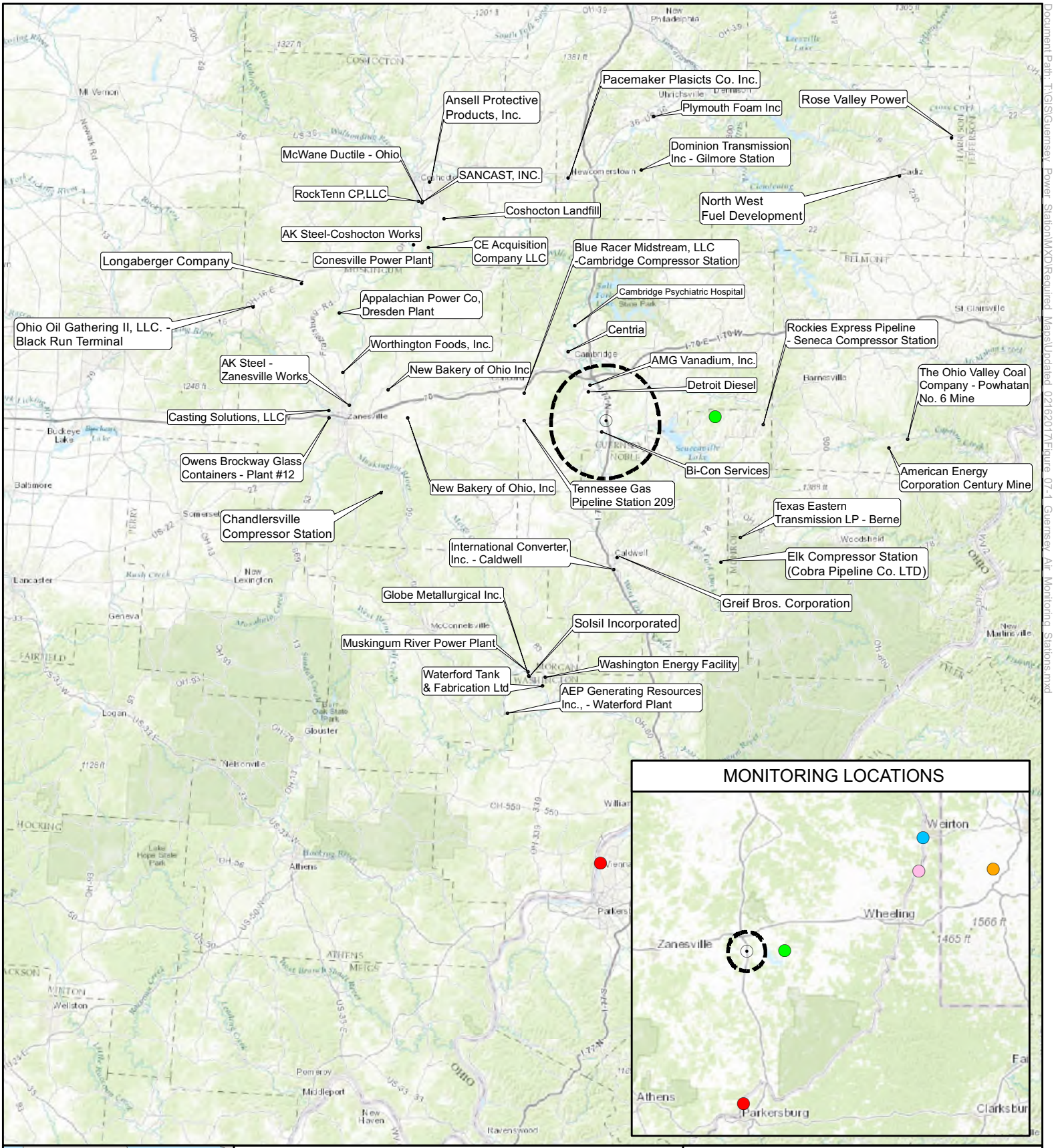
(2) Federal Aviation Administration Filings

Filing with the Federal Aviation Administration (FAA) is required for structures over 200 feet above base elevation or for structures located within certain imaginary surfaces extending out

from airport runways or heliport landing or takeoff areas. Although the Facility's three 180-foot tall HRSG stacks do not trigger this requirement, GPS determined it was important to obtain documentation from the FAA for its records to support financing of the Facility. A Notification to the FAA was submitted on March 14, 2017. GPS expects the FAA to issue Determinations of No Hazard for the three proposed Facility HRSG stacks.

Section 4906-4-07: Figures

- **Figure 07-1: Air Quality Monitoring Stations and Emission Source Mapping**
- **Figure 07-2: Air Modeling Concentration Isopleths: 1-hour NO_2 Normal Operation**
- **Figure 07-3: Air Modeling Concentration Isopleths: Annual NO_2**
- **Figure 07-4: Air Modeling Concentration Isopleths: 1- hour CO**
- **Figure 07-5: Air Modeling Concentration Isopleths: 8-hour CO**
- **Figure 07-6: Air Modeling Concentration Isopleths: 24-hour PM_{10} (NAAQS) and 24-hour $PM_{2.5}$ (PSD)**
- **Figure 07-7: Air Modeling Concentration Isopleths: Annual PM_{10} (NAAQS) and Annual $PM_{2.5}$ (PSD)**
- **Figure 07-8: Air Modeling Concentration Isopleths: 24-hour $PM_{2.5}$ (5-year average - NAAQS)**
- **Figure 07-9: Air Modeling Concentration Isopleths: Annual $PM_{2.5}$ (5-year average - NAAQS)**
- **Figure 07-10: Air Modeling Concentration Isopleths: 1-hour SO_2 (5-year average - NAAQS)**
- **Figure 07-11: Air Modeling Concentration Isopleths: 3-hour SO_2**
- **Figure 07-12: Air Modeling Concentration Isopleths: 24-hour SO_2**
- **Figure 07-13: Air Modeling Concentration Isopleths: Annual SO_2**
- **Figure 07-14: Airports and Navigation Facilities**

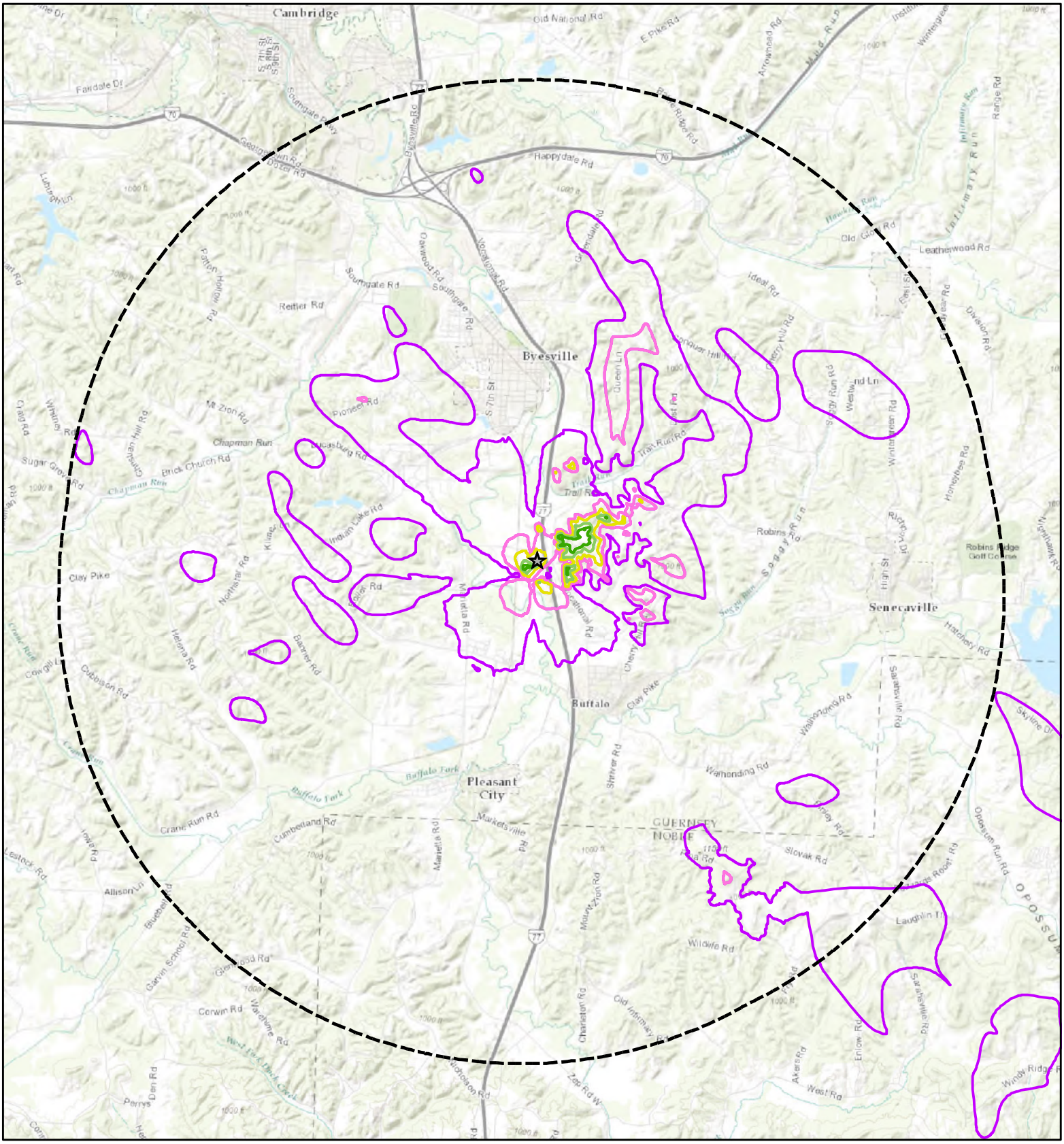


TETRA TECH

Figure 07-1
Guernsey Power Station

Air Monitoring Stations and Emission Source Mapping

Guernsey County, Ohio



Legend

- Project Site
- 5-Mile Radius
- 1-hour NO_2 Concentration Contour (µg/m3)

4 7 10 13 16

Maximum impact = 20.8 µg/m³

N

0 0.5 1 2 Miles

Figure 07-2
Air Modeling Concentration Isopleths:
1-hour NO_2 Normal Operation

Guernsey Power Station
Guernsey County, Ohio

Guernsey Power Station

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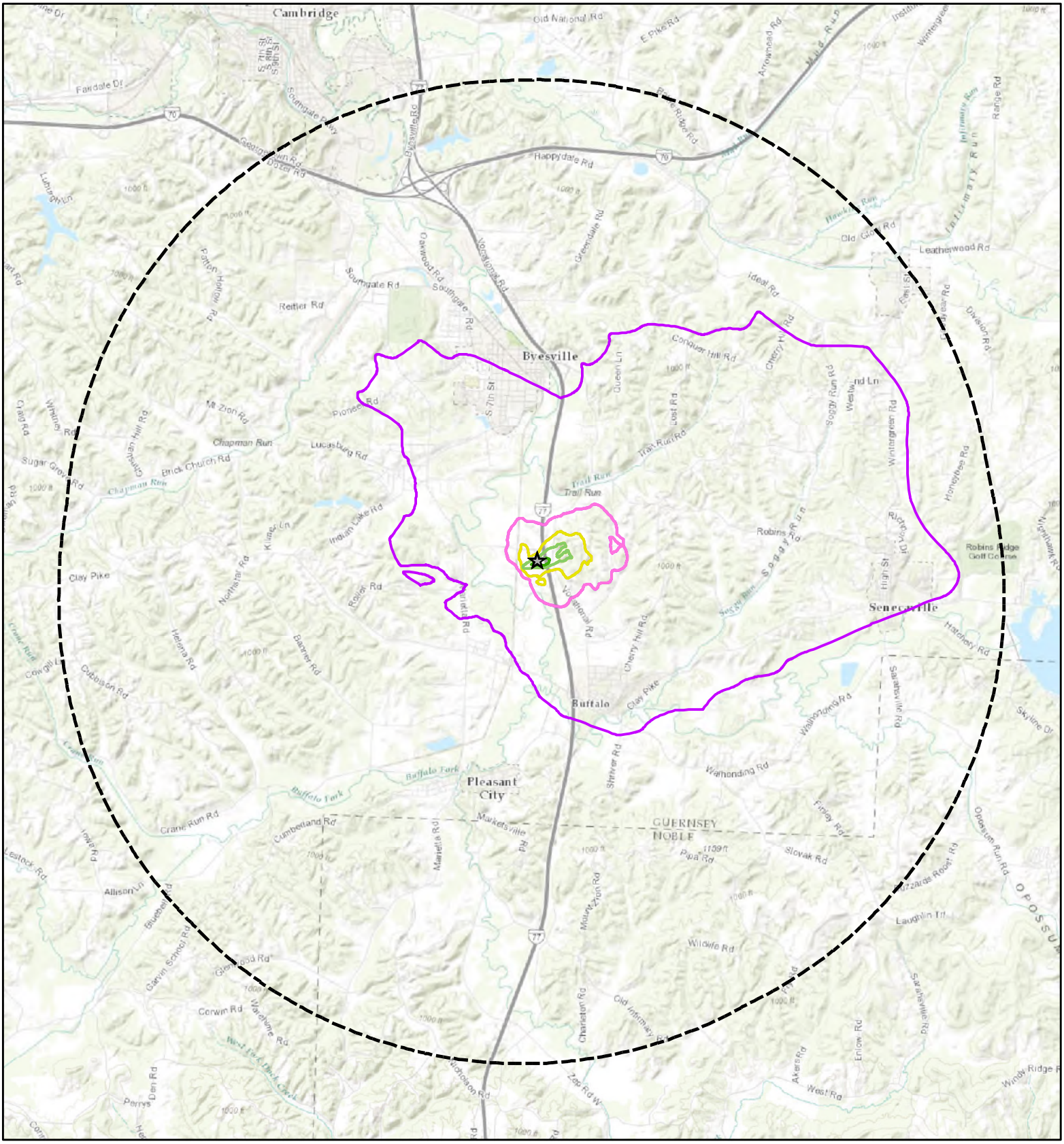

Legend

- Project Site
- 5-Mile Radius
- Annual NO_2 Concentration Contour (µg/m3)

0.06 0.24 0.42 0.6 0.78

Maximum impact = 1.03 µg/m³

N

0 0.5 1 2 Miles

Figure 07-3
Air Modeling Concentration Isopleths: Annual NO_2

Guernsey Power Station
Guernsey County, Ohio

Guernsey Power Station

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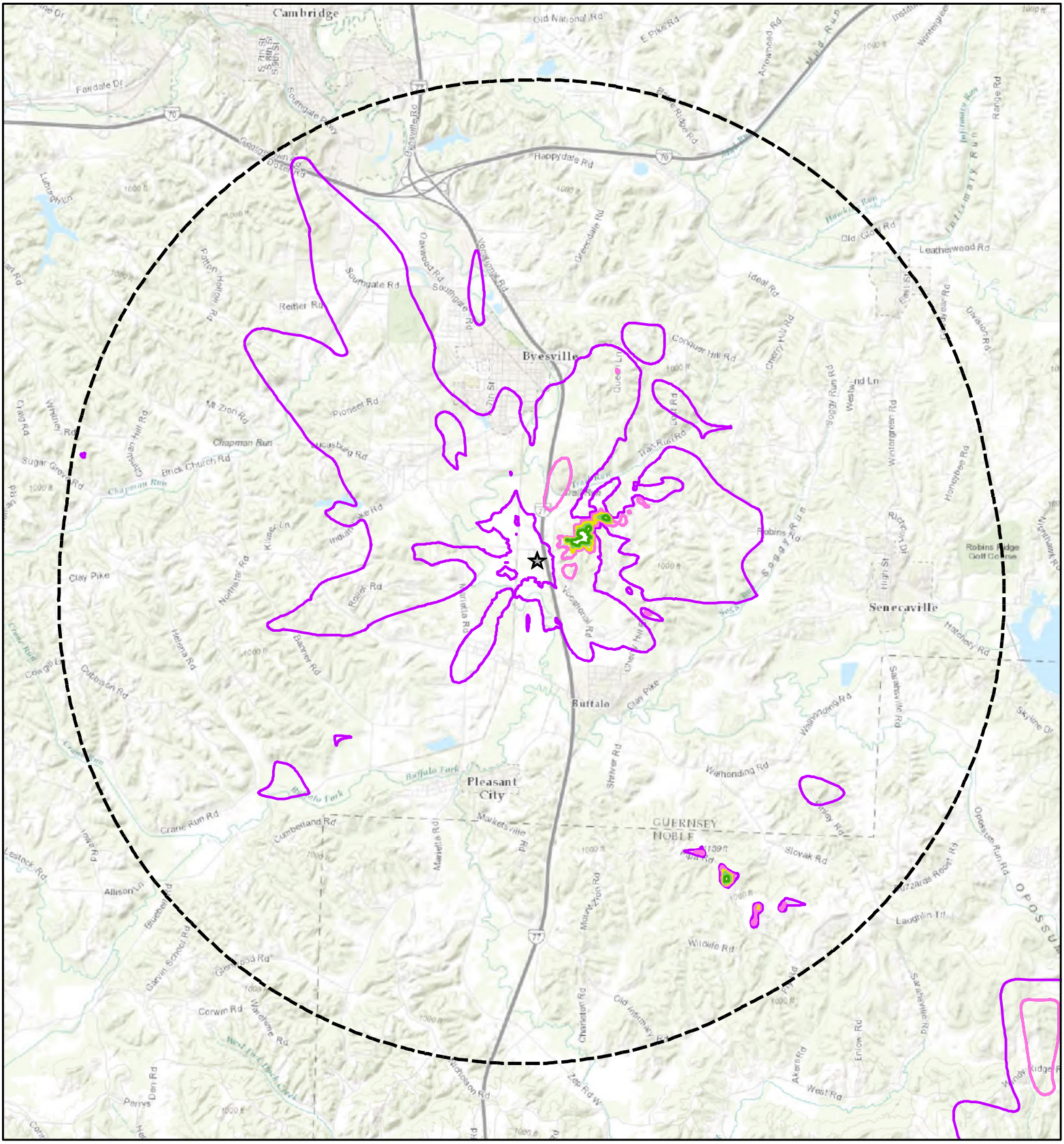

Figure 07-4
Air Modeling Concentration Isopleths: 1-hour CO

Guernsey Power Station
Guernsey County, Ohio

Guernsey Power Station

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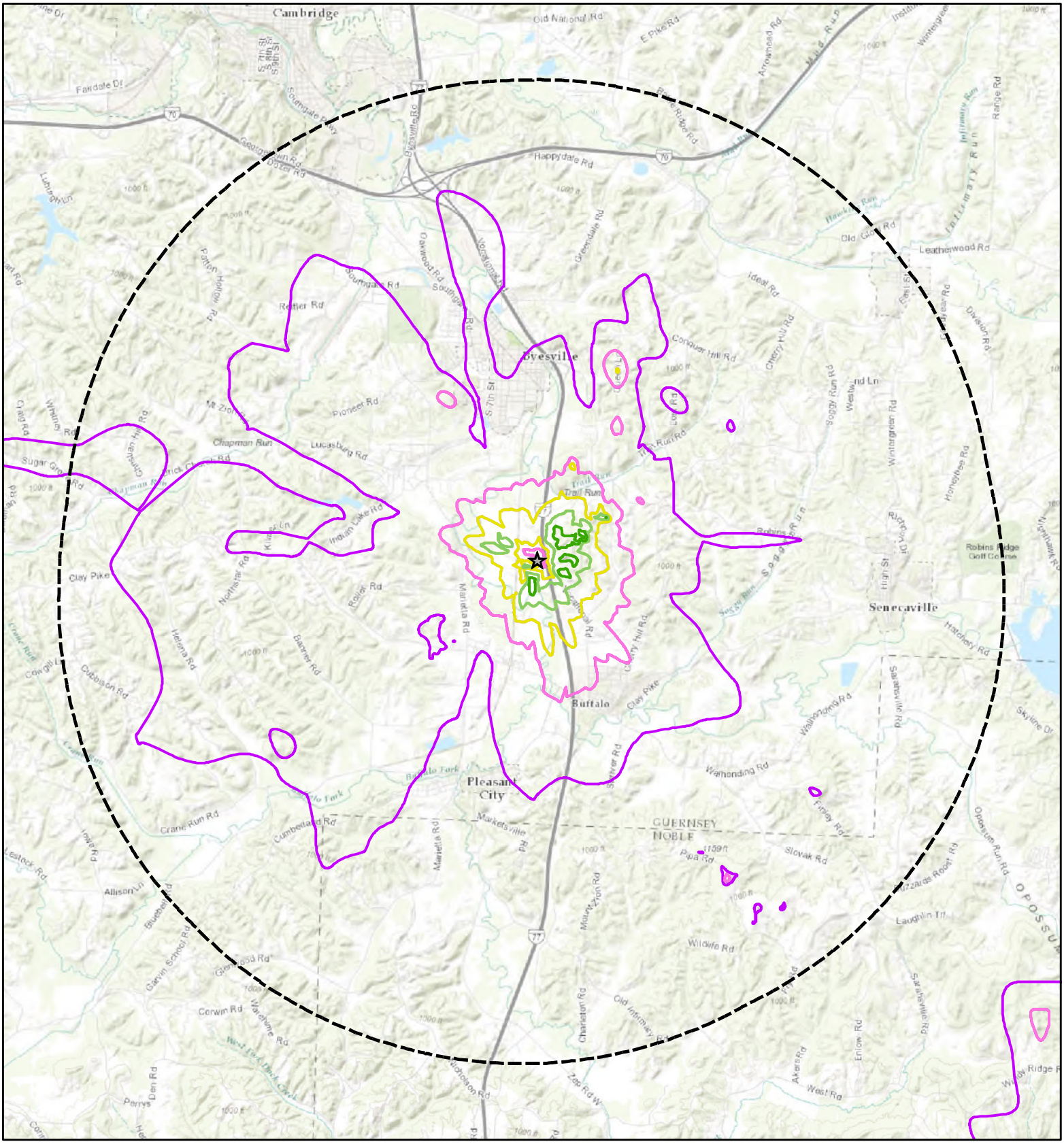

Legend

- Project Site
- 5-Mile Radius
- 8-hour CO Concentration Contour (µg/m3)

10 17.5 25 32.5 40

Maximum impact = 51.2 µg/m³

N

0 0.5 1 2 Miles

Figure 07-5
Air Modeling Concentration Isopleths: 8-hour CO

Guernsey Power Station
Guernsey County, Ohio

Guernsey Power Station

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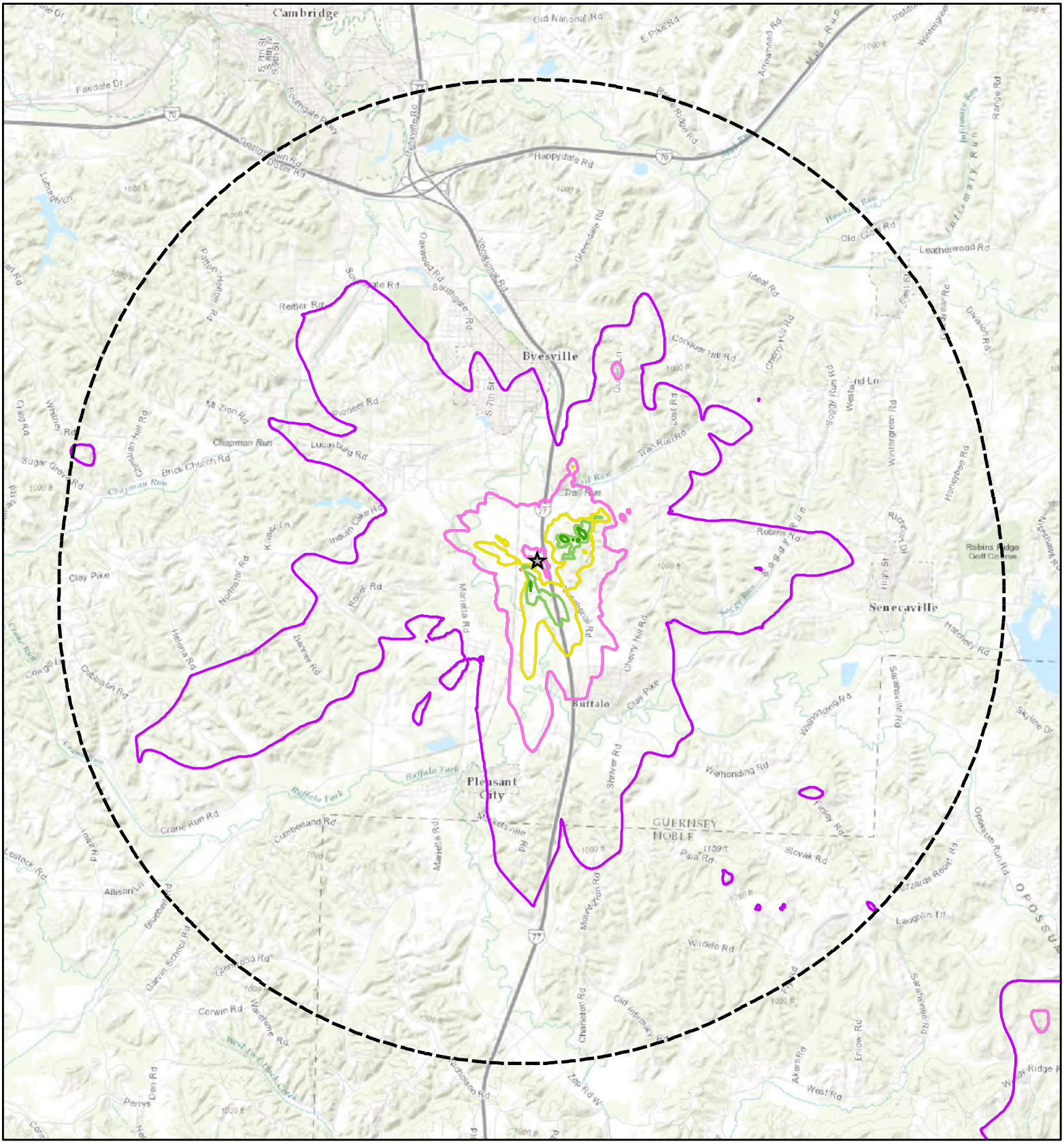

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Project Site

5-Mile Radius

24-hour PM_{10} and 24-hour $PM_{2.5}$ Concentration Contour (µg/m3)

0.4 0.8 1.2 1.6 2

Maximum impact = 2.51 µg/m³

N

0 0.5 1 2 Miles

Figure 07-6
Air Modeling Concentration Isopleths:
24-hour PM_{10} (NAAQS) and
24-hour $PM_{2.5}$ (PSD)

Guernsey Power Station
Guernsey County, Ohio

Guernsey Power Station

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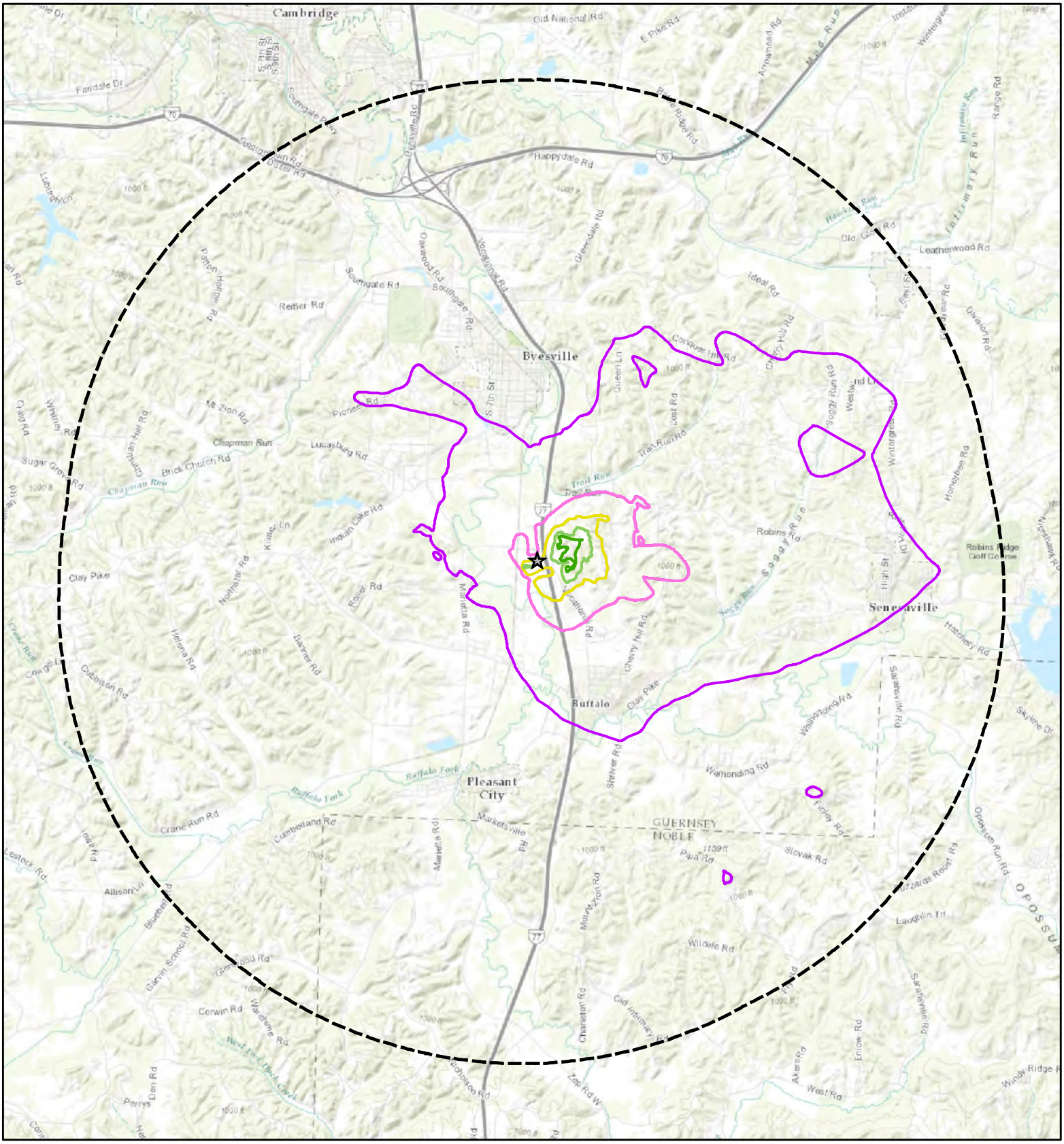

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Project Site

5-Mile Radius

Annual PM_{10} and Annual $PM_{2.5}$ Concentration Contour (µg/m3)

0.03 0.08 0.13 0.18 0.23

Maximum impact = 0.28 µg/m³

N

0 0.5 1 2 Miles

Figure 07-7
Air Modeling Concentration Isopleths:
Annual PM_{10} (NAAQS) and
Annual $PM_{2.5}$ (PSD)

Guernsey Power Station
Guernsey County, Ohio

Guernsey Power Station

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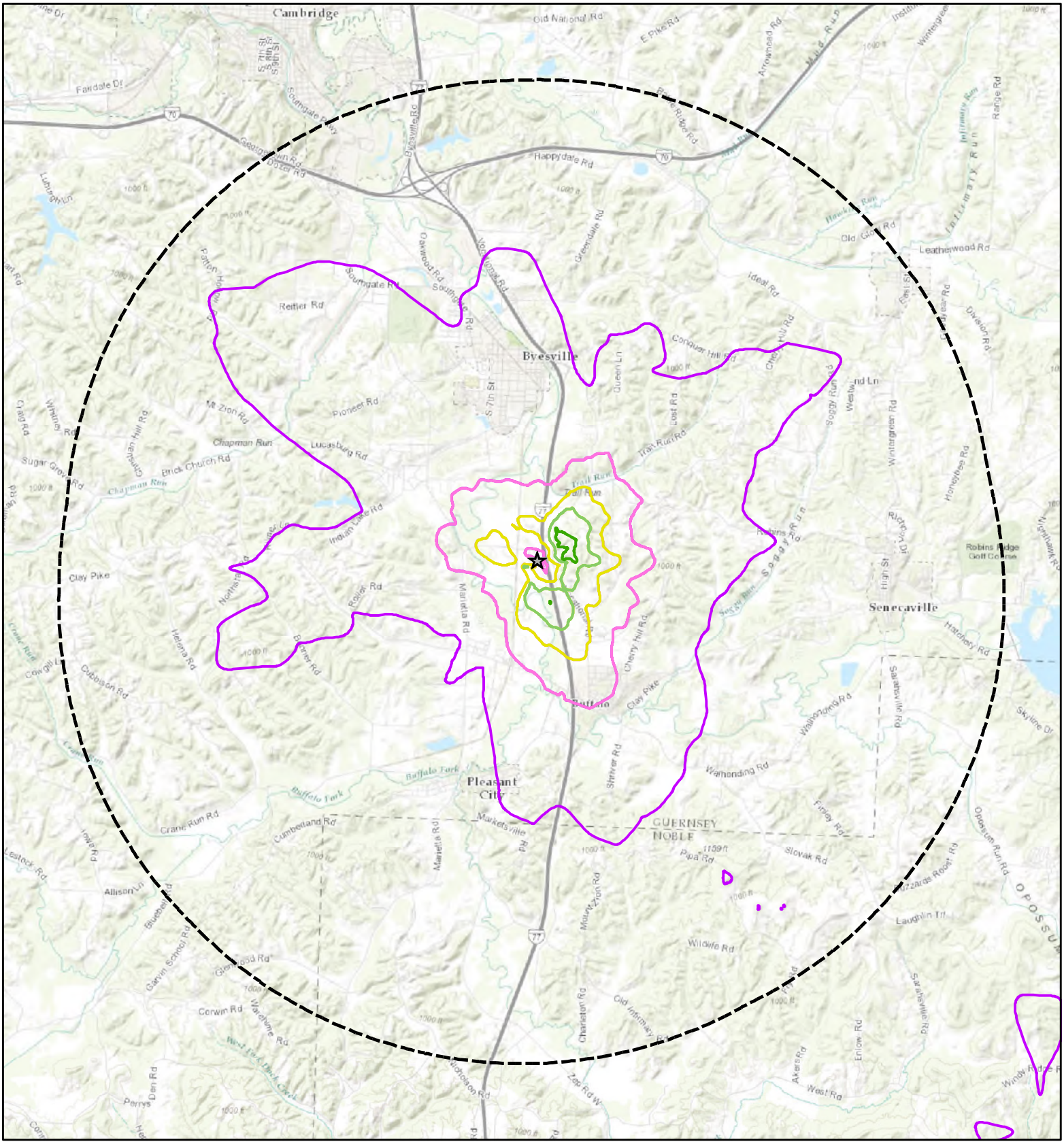

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Project Site

5-Mile Radius

24-hour $PM_{2.5}$ Concentration Contour (µg/m3)

0.4 0.7 1 1.3 1.6

Maximum impact = 1.94 µg/m³

N

0 0.5 1 2 Miles

Figure 07-8
Air Modeling Concentration Isopleths:
24-hour $PM_{2.5}$
(5-year average - NAAQS)

Guernsey Power Station
Guernsey County, Ohio

Guernsey Power Station

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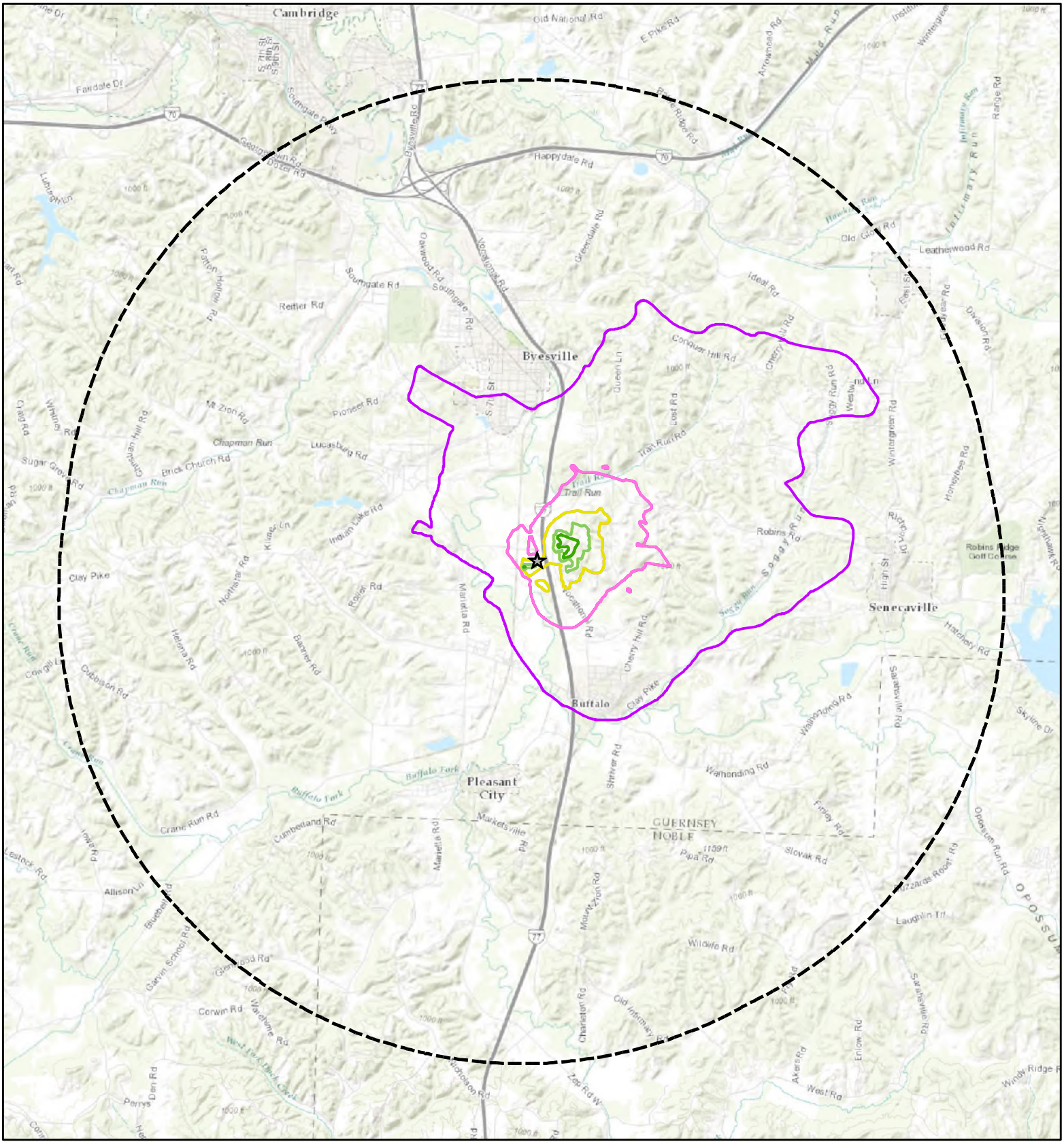

Figure 07-9
Air Modeling Concentration Isopleths:
Annual $PM_{2.5}$
(5-year average - NAAQS)

Guernsey Power Station
Guernsey County, Ohio

Guernsey Power Station

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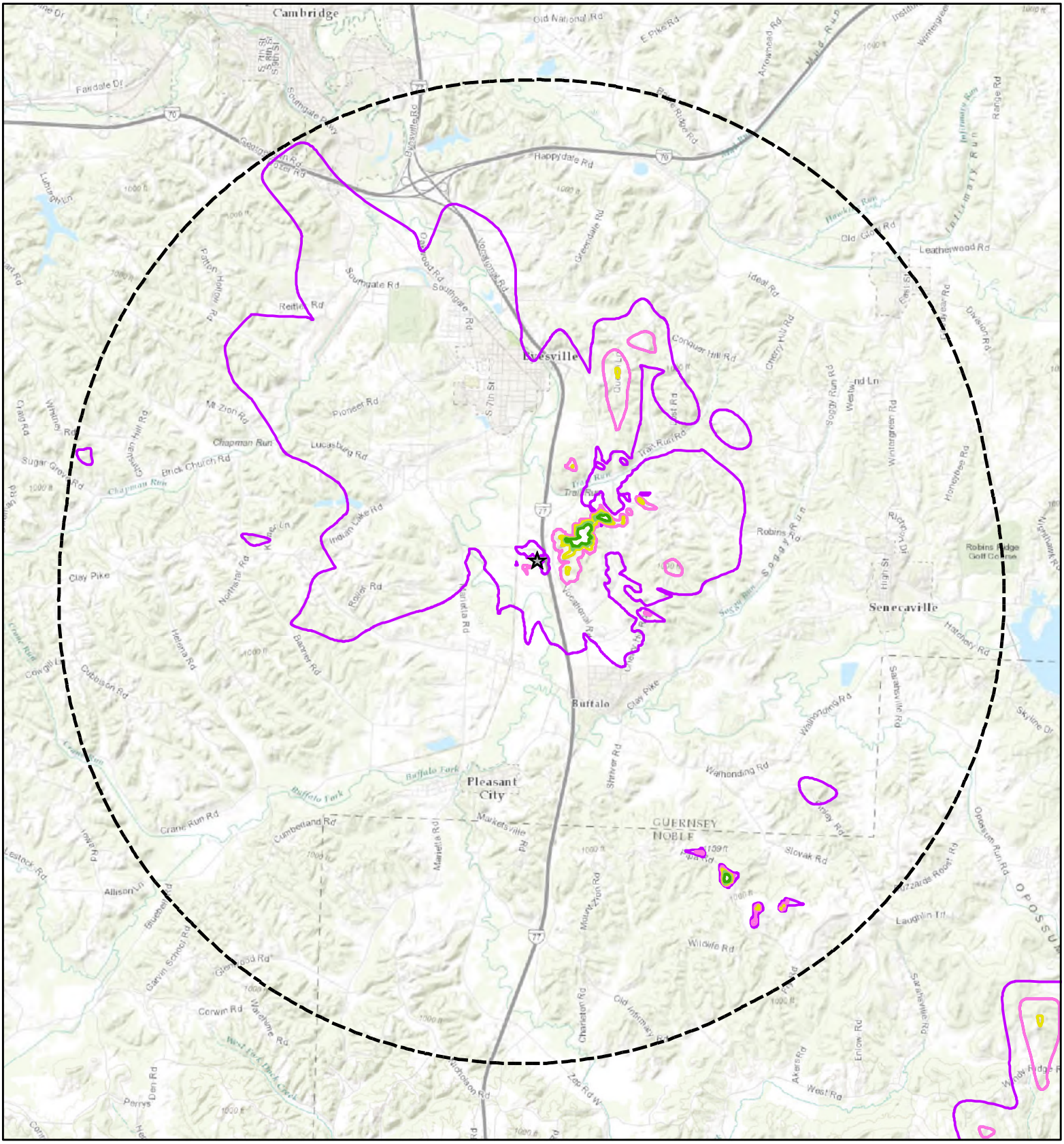

Legend

Project Site

5-Mile Radius

1-hour SO_2 Concentration Contour (µg/m3)

1 1.5 2 2.5 3

Maximum impact = 5.87 µg/m³

N

0 0.5 1 2 Miles

Figure 07-10
Air Modeling Concentration Isopleths:
1-hour SO_2
(5-year average - NAAQS)

Guernsey Power Station
Guernsey County, Ohio

Guernsey Power Station

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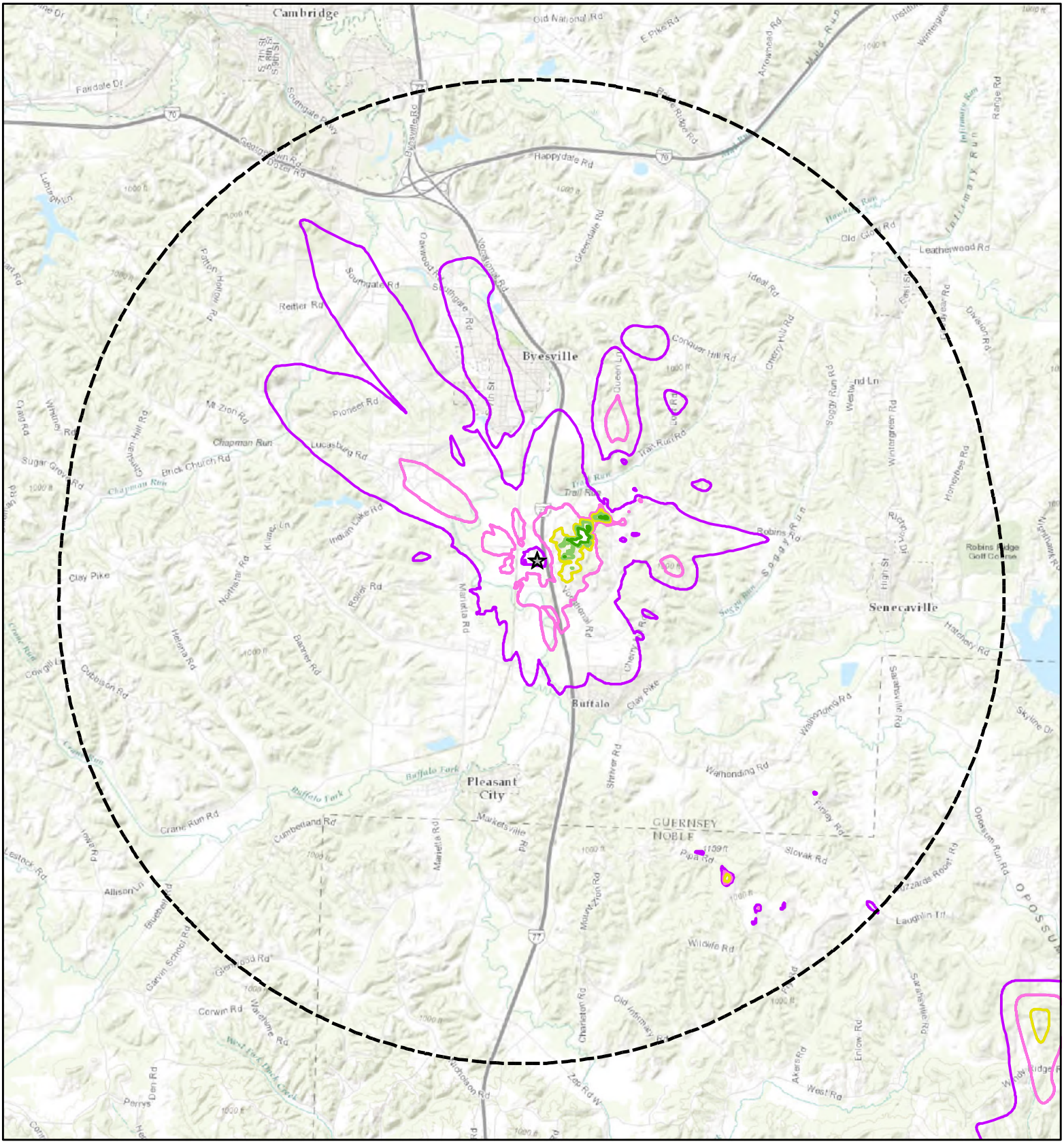

Figure 07-11
Air Modeling Concentration Isopleths: 3-hour SO_2

Guernsey Power Station
Guernsey County, Ohio

Guernsey Power Station

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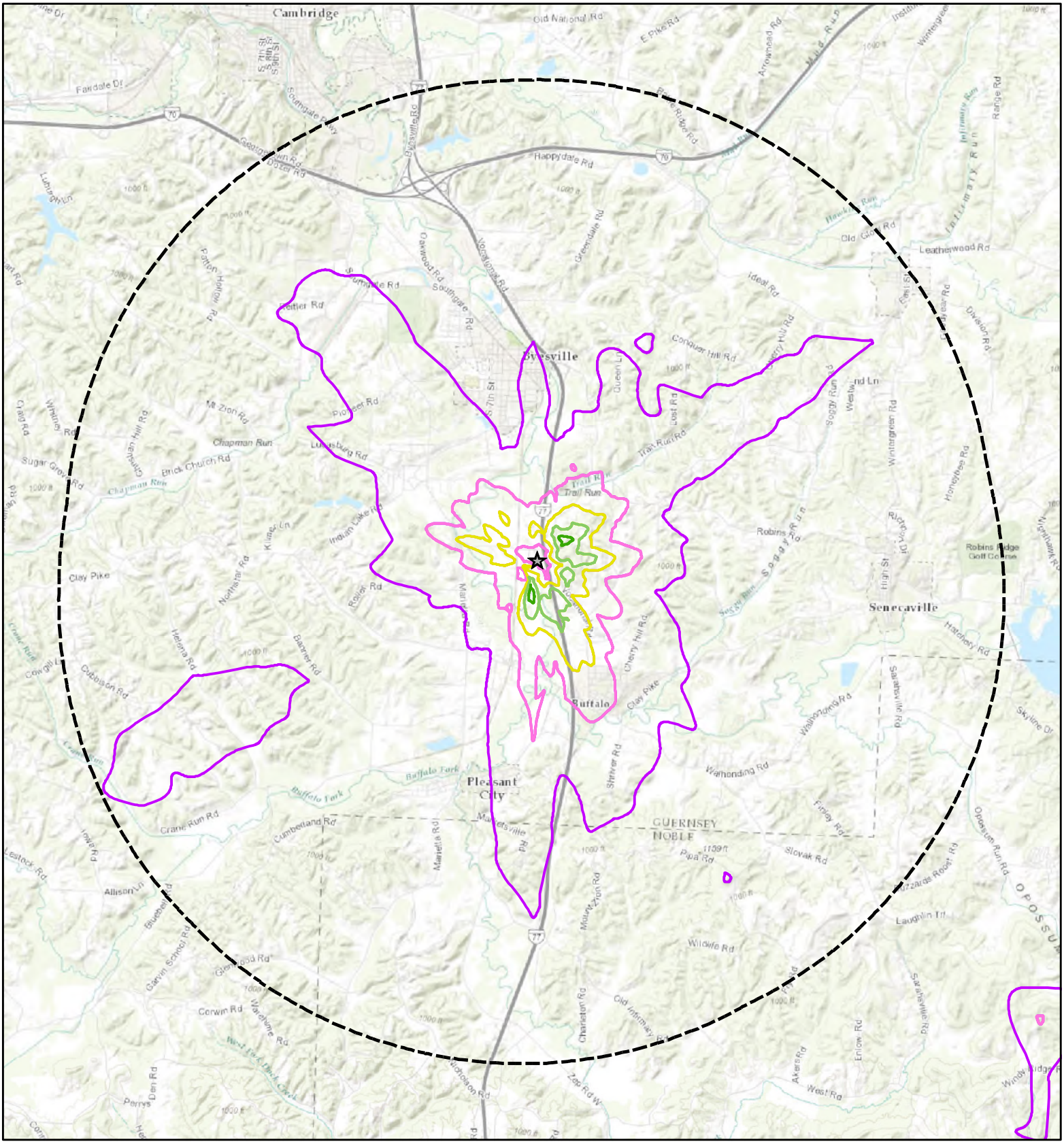

Legend

- Project Site
- 5-Mile Radius
- 24-hour SO_2 Concentration Contour (µg/m3)

0.2 0.325 0.45 0.575 0.7

Maximum impact = 0.80 µg/m³

N

0 0.5 1 2 Miles

Figure 07-12
Air Modeling Concentration Isopleths: 24-hour SO_2

Guernsey Power Station
Guernsey County, Ohio

Guernsey Power Station

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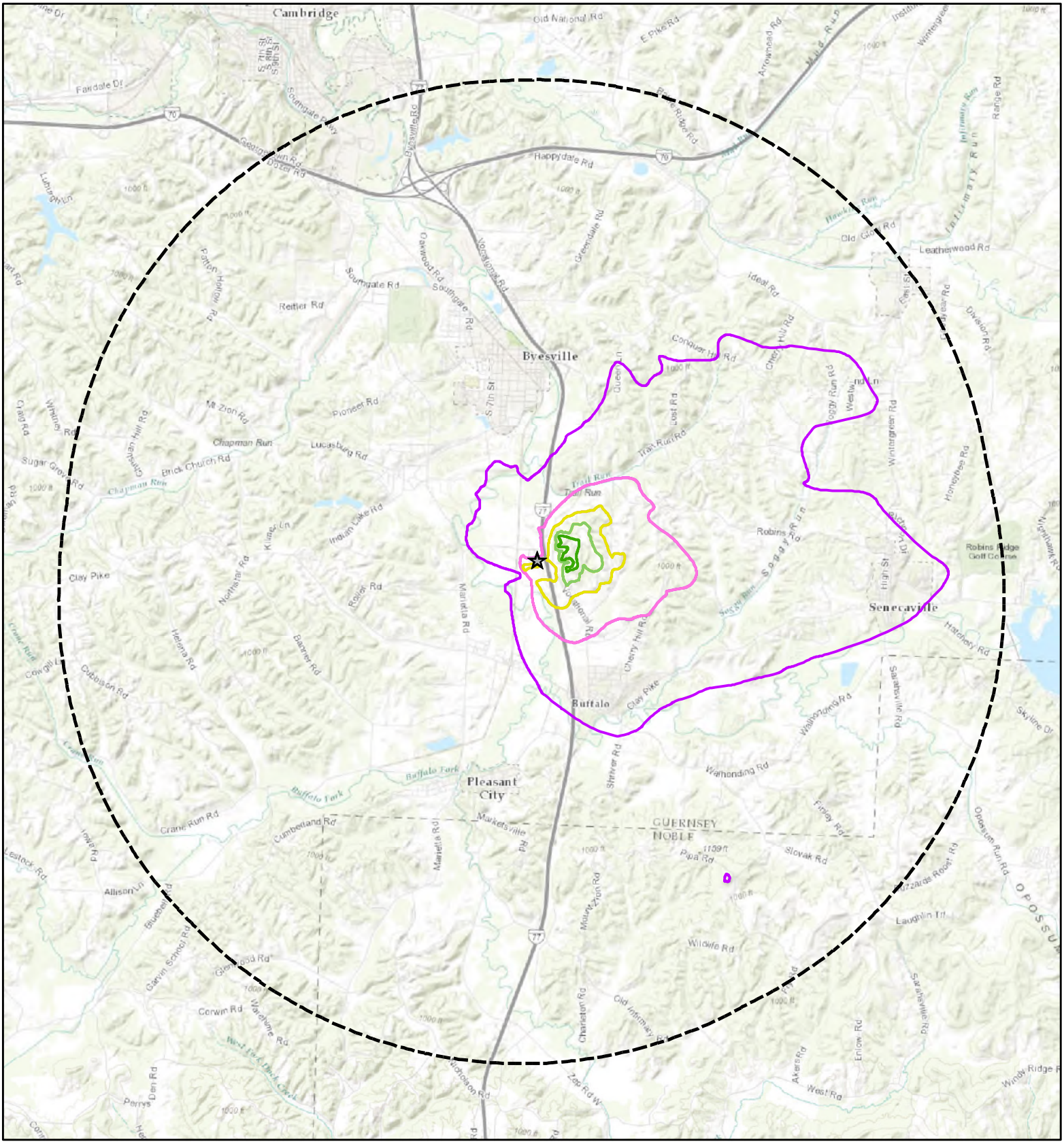

Legend

- Project Site
- 5-Mile Radius
- Annual SO_2 Concentration Contour (µg/m3)

0.015 0.03 0.045 0.06 0.075

Maximum impact = 0.09 µg/m³

N

0 0.5 1 2 Miles

Figure 07-13
Air Modeling Concentration Isopleths: Annual SO_2

Guernsey Power Station
Guernsey County, Ohio

Guernsey Power Station

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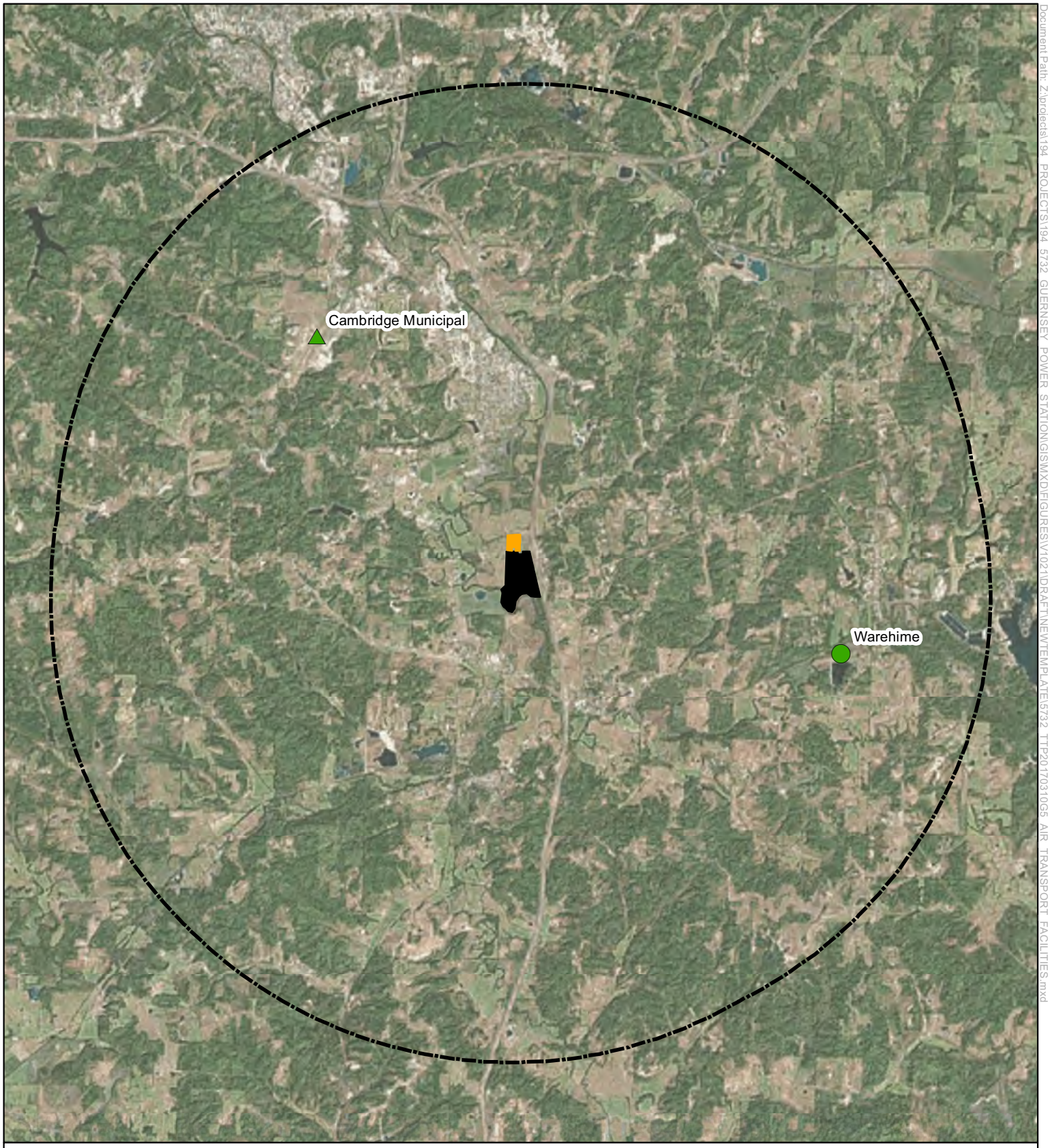

Legend

- Facility Site
- Proposed Laydown/Parking
- 5-Mile Radius
- Aviation Facility - Private
- Aviation Facility - Public

TETRA TECH

0 1 2 Miles

Figure 07-14
Guernsey Power Station

Airports and Navigation Facilities

Service Layer Credits: Esri et al. 2016, GEOhio 2016.

Guernsey County, Ohio

4906-4-08 Health and Safety, Land Use, and Ecological Information

The data presented in this section are intended to provide a basis for assessing the costs and benefits of the Facility with regard to health and safety, ecology, land use, community development, cultural and aesthetic qualities, and agricultural lands.

(A) HEALTH AND SAFETY

(1) Equipment Safety

(a) Public Safety Equipment

There will be no public access to the Facility. Puritan Street will lead to a controlled security fence that will surround the Facility. The security fence will have card-activated gates and Facility operator access control. All appropriate NERC standards for physical and/or cyber security will be met by the Facility.

Occupational Safety and Health Administration (OSHA) requirements will be implemented to ensure worker safety during Facility construction and operation. For example, the National Fire Protection Association's (NFPA) Standard 56: "Standard for Fire and Explosion Prevention During Cleaning and Purging of Flammable Gas Pipeline System," which requires that only inert gases or compressed air be used for all cleaning of pipes, will be implemented.

A variety of alarms and control systems will be incorporated to provide early identification of emergency situations. The Facility fire protection system will consist of hydrants, hose stations, a sprinkler system, a deluge system, a CO_2 monitoring system, and portable fire extinguishers. During construction and operation, special considerations will assure chemicals and hazardous substances that potentially pose safety hazards will be

appropriately handled, stored, and disposed of in accordance with regulatory requirements and manufacturers' recommendations.

(b) Equipment Reliability

The reliability of the DLN system, because it is an integral combustion turbine component, exceeds combustion turbine reliability. A failure of a DLN combustor would require that the respective turbine be shut down. The oxidation catalyst is similarly integral to overall Facility operation. The SCR system is of high reliability. Ceramic block life span varies by manufacturer, with replacement normally completed during a regularly scheduled preventative maintenance outage lasting a couple of days. The CEMS will detect a deterioration of performance well before a failure of the catalyst occurs. At no time will a unit operate if its respective SCR is not functioning properly.

(c) Safety Manuals

Unlike wind energy facilities, standard safety manual are not available from equipment manufacturers. Rather, the Facility will develop Facility-specific safety procedures and practices that address equipment as well as potential community concerns. Emergency planning and safety will be addressed during both construction and operation.

(d) Public Access

There will be no public access to the proposed Facility. A security fence will be installed around the Facility with card-activated gates and Facility operator access control.

(e) Emergency Plans

Safety is extremely important to GPS, and additional procedures will be implemented prior to initiation of construction in order to anticipate and prepare for

potential emergencies. An Emergency Response Plan with specific emergency response actions for the Facility will be prepared prior to construction mobilization, and will be designed and written to assist the Facility's personnel and outside emergency response entities. The Emergency Response Plan will be developed in consultation with Guernsey County and local emergency responders to address different types of potential emergencies; emergency resources (equipment or personnel); levels of emergency response; principles to be applied during a response; detailed measures for initial response, containment, rescue, first aid and evacuation; termination of an emergency; notification procedures; drills and training; and the process for updating and modifying emergency procedures.

Prior to mobilization for Facility construction, GPS and the construction contractor will conduct the following activities as a component of Emergency Response Plan development:

- Interview occupational medical clinics within the vicinity of the Facility Site to select the clinic best suited based upon location, quality of care, and commitment to injury management principles.
- Work closely with all local providers of emergency medical response services to assess response times and capabilities of each responder. The assessment will include capabilities to rescue from various heights. Cranes and aerial lifts or other appropriate means will be provided during construction if such capabilities are not in place.
- Survey local hospitals to verify services and other details as an occupational health safeguard. The location of the nearest trauma center will also be verified.

- Conduct a site visit with local law enforcement agencies to formally initiate the construction process and familiarize local authorities with the schedule, planned activities, and other relevant details.

During construction, there will be on-site security staff to secure the Facility Site and construction materials. Limited police service and/or private traffic control may be needed and, if so, will be contracted during construction.

The Emergency Response Plan utilized during construction will be modified to reflect operational conditions. A similar detailed review of procedures and resources will occur to ensure appropriate measures are implemented. The Emergency Response Plan will incorporate fire protection, detection, and alarm systems for use throughout the construction process and operation. This will include classification of various hazard areas, and providing adequate fire water and other fire-fighting systems to address various fire situations. Class "A" fires (ordinary combustibles), Class "B" fires (flammable liquid or gas), and Class "C" fires (electrical) will all be addressed in the plan.

(2) Impact of Air Pollution Control Equipment Failures

No impacts to the population are anticipated as a result of air pollution control equipment failures.

The reliability of the DLN system, because it is an integral combustion turbine component, exceeds combustion turbine reliability. A failure of a DLN combustor would require that the respective turbine be shut down. The oxidation catalyst is similarly integral to overall safe Facility operation. The SCR system is of high reliability. Ceramic block life span varies by manufacturer, with replacement normally completed during a regularly scheduled preventative maintenance outage lasting a couple of weeks. The CEMS will detect a deterioration of performance well before

a failure of the catalyst occurs. At no time will a unit operate if its respective SCR is not functioning properly. The local population is not anticipated to be adversely impacted, as early detection systems would alert facility personnel and promptly initiate shutdown.

(3) Noise

An analysis of construction and operational sound anticipated from the Facility has been completed, as detailed in Appendix H. There are no specific numerical decibel (dB) limits applicable to the Facility at the local, county, state, or federal level; rather, the OPSB evaluates acceptable sound levels based upon the specific setting of a given project. In the case of this Facility, it is located adjacent to a major interstate highway (I-77), an active rail line, and industrial facilities (e.g., Shelly Company, Basic Systems, Inc. and BSI Group/BiCon Services). In addition to these elements of background noise integral to its setting, the Facility has incorporated considerable mitigation into its sound reduction design.

(a) Construction Noise

Construction of the Facility is expected to be customary of electric generating facilities' construction schedule, equipment, and activities. Construction is anticipated to require approximately 33 months. The last four to six months of construction will include commissioning and startup, which will involve periodic steam blows.

Potential sound level impacts associated with Facility construction are addressed in the report provided in Appendix H. As reflected in that report, construction sound levels are predicted to range from 43 to 65 A-weighted decibels (dBA) at the ambient monitoring locations (MLs), as shown in Table 08-1.

TABLE 08-1
ESTIMATED FACILITY CONSTRUCTION SOUND LEVELS

Construction Phase	USEPA Construction Noise Level 50 feet	Facility Property Line	ML-1	ML-2	ML-3	ML-4	ML-5
Phase 1: Site clearing and grading	86	66	61	47	44	45	47
Phase 2: Excavation and placement of major structural concrete foundations	89	69	64	50	48	49	51
Phase 3: Erection of building structural steel	85	65	60	46	44	44	46
Phase 4: Installation of mechanical and electrical equipment	83	63	59	45	43	43	45
Phase 5: Equipment installation, commissioning and testing	89	69	65	51	49	49	51

Periodically, sound levels may be higher or lower than those presented in Table 08-1; however, the overall sound levels should generally be lower due to excess attenuation and the trend toward quieter construction equipment in the intervening decades since these data were developed. In addition, the Facility will make reasonable efforts to minimize the impact of noise resulting from construction activities at noise-sensitive areas through the use of noise mitigation, further discussed in Section 4906-04-08(A)(3)(d). Because of the temporary nature of the construction noise, no adverse or long-term effects are expected. A complaint resolution process has been established that will be utilized during the construction period to resolve potential issues (Appendix F).

(b) Operational Noise

Sound levels anticipated to be associated with Facility operation were evaluated for normal operation, assuming that all normally operating components identified previously are operating continuously and concurrently at the representative manufacturer-rated sound levels. A sound contour plot of the resulting analysis is provided in Figure 08-1. Details of the analysis are presented in Appendix H. Specific numerical results are shown in Table 08-2.

TABLE 08-2
ACOUSTICAL MODEL RESULTS SUMMARY – MITIGATED DESIGN

Monitoring Location	Nighttime Ambient, L_{eq}[a], dBA	Facility Sound Level, dBA	Total Sound Level (Ambient + Facility), dBA
ML-1	37	54	54
ML-2	46	34	46
ML-3	35	36	38
ML-4	36	37	39
ML-5	32	38	39

[a] L_{eq} = the equivalent continuous sound level, reflecting the manner in which total sound energy varies over a period of time.

As shown in Figure 08-1, the majority of surrounding residences will experience Facility sound levels less than 50 dBA. Approximately four residences west of I-77 (represented by ambient conditions at ML-1) and approximately five residences east of I-77 (represented by ambient conditions at ML-2) are located within the area that would experience Facility sound levels greater than 50 dBA, but less than 55 dBA.

Daytime ambient levels at both locations (48 dBA for ML-1 and 57 dBA for ML-2) are such that Facility sound levels are not anticipated to result in a significant change in existing conditions. In fact, ambient conditions for the homes east of I-77 have the potential to be even higher than the 57 dBA recorded, as ML-2 is located approximately 1,350 feet from I-77, while some of the homes are within 200 feet of the highway.

Overall, the Facility setting continues to be strongly influenced by I-77 traffic at night, although measured levels are somewhat quieter. During nighttime hours, when ambient levels are somewhat quieter, residents are likely to be indoors. Typical residential construction provides approximately 15 dB of additional noise reduction (Harris 1998). Noise levels from the Facility would, therefore, result in interior noise levels of approximately 33 dBA to 39 dBA at the nearest residences; at more distant residences, beyond the 55 dBA contour shown in Figure 08-1, potential effect would be even less. Therefore, nighttime sound levels are expected to be well within the range of typical interior noise levels in bedrooms where people are sleeping, which is 30 dBA to 40 dBA (Harris 1998).

(c) Noise-Sensitive Areas

The noise-sensitive areas in proximity to the Facility are predominantly residential. In its immediate surroundings, the Facility Site is located between I-77 and a rail line in an agricultural area, with some residential and agricultural structures on the Facility Site as well as on neighboring properties. Properties located east of I-77 were evaluated due to physical proximity to the Facility Site even though they are separated by I-77 and experience elevated noise levels due to vehicle traffic.

Two residences and several garages are located on Puritan Street, which extends south from Seneca Lane into the Facility Site. These residences and structures will be demolished prior to construction to accommodate the Facility. One residence and associated structures at the northwestern corner of the Facility Site will also be demolished. The residence at the intersection of Seneca Lane and Puritan Street and the residence on the north side of Seneca Lane west of Puritan Street are expected to remain in residential use throughout construction and operation. Continuing westward along Seneca Lane, west of the railroad tracks, an additional three residences are located northwest and west of the Facility Site within 1,000 feet of the Facility (see Figure 08-10B).

Seneca Lane intersects to the west with Marietta Road, which runs generally north-south within one mile of the Facility Site (approximately 0.65 miles west). Scattered residences are located along Marietta Road. As discussed further in Section 4906-04-08 (A)(3)(e), an ambient noise monitor was deployed along Marietta Road to represent the existing noise levels reflecting residences in this area. Similarly, east of the Facility Site (on the opposite side of I-77), Vocational Road and Buffalo Mine Road support residential uses and were also selected as a monitoring location.

Other residential areas within one mile include two neighborhoods along Clay Pike Road (south and southwest of the Facility Site) that are of relatively higher density. The two neighborhoods are separated from each other by industrial uses (Basic Systems Inc. and BSI Group/Bi-Con Services, which provide pipe and pressure vessel fabrication). The nearest residence to the Facility Site within these two neighborhoods is on Walnut Street, approximately 0.5 miles southwest of the Facility Site property boundary. A third

residential neighborhood is located southeast of the Facility Site, east of I-77, with only a small portion of the neighborhood within one mile of the Facility Site.

Additional potentially noise-sensitive areas within one mile of the Facility Site include the Guernsey-Noble Vocational School, located across I-77 approximately 0.6 miles southeast of the Facility Site. The property boundary of the Meadowbrook Middle School and High School is located just over one mile northwest of the Facility Site. No additional schools, hospitals, places of worship, or cemeteries were identified within one mile of the Facility Site. The nearest place of worship and cemetery is Bethlehem Church and the abutting Bethel Methodist Protestant Cemetery, which are just over one mile northwest of the Facility Site. The nearest hospital is Southeastern Ohio Regional Medical Center, approximately 7.2 miles north-northwest of the Facility Site in the City of Cambridge. The modeled sound contours illustrated in Figure 08-1 reflect anticipated sound levels at all locations within one mile of the Facility Site.

(d) Noise Mitigation Measures

Construction Noise

Construction noise is difficult to control because of the mobile nature of its sources and the flexibility of schedule inherent in most construction work. However, construction is also temporary in nature. In order to mitigate the possible effect of noise caused during the temporary construction period, the following steps will be taken:

- Maintain all construction tools and equipment in good operating order according to manufacturers' specifications.
- To the extent practicable, schedule construction activity during normal working hours on weekdays when high sound levels are typically present, and are found

acceptable. Some limited activities, such as concrete pours, will be required to occur continuously until completion.

- Equip any internal combustion engine used for any purpose on the job or related to the job with a properly operating muffler that is free from rust, holes, and leaks.
- For construction devices that utilize internal combustion engines, ensure the engine's housing doors are kept closed and install noise-insulating material mounted on the engine housing consistent with manufacturers' guidelines, if possible.
- Prior to the start of construction, implement the Complaint Resolution Plan, provided in Appendix F, a procedure for addressing any complaints received from residents.
- Before conducting specific loud noise activities, such as steam blows, communicate with the community to plan ahead for such events.

By scheduling the construction effort to be as efficient as possible, sound associated with construction activity will be minimized as the duration of the construction effort is minimized. As construction noise is temporary, no adverse long-term effects are anticipated.

Operational Noise

The Facility design will implement a number of sound control elements. There are many combinations of possible mitigation measures that could be employed to achieve the design goal. One of the combinations that will be reasonably representative is described below.

Specific sound-control elements are incorporated into the Facility noise analysis, as detailed in Appendix H. The Facility will be highly efficient and state-of-the-art, incorporating design features to minimize the potential adverse effects of operational noise on the surrounding community. For example, the major equipment will be housed within acoustically-rated structures. Furthermore, the main step-up transformers will be low noise-rated and the HRSG exhaust stack will include a stack silencer. Key features of the Facility's low-noise design are:

- Facility siting to maximize buffer between noise sensitive areas and noise-producing equipment;
- The CTGs and STGs housed within acoustical buildings for each train, equipped with acoustic silencers and attenuators as required to reduce noise emissions from ventilation openings, fans, and make-up air units;
- Safety and relief valves that release high pressure steam equipped with silencing, to the extent permitted by the American Society for Mechanical Engineers code;
- The boiler feed pumps housed within an acoustical structure;
- Low-noise ACC design;
- A combustion turbine inlet silencing package designed to reduce air inlet sound power levels;
- Acoustical lagging of the CTG exhaust diffuser as it exits the turbine compartment and enters the HRSG;
- A stack silencing package inclusive of the HRSG will be designed to reduce sound pressure levels leaving the flue in the stack structure; and

- National Electrical Manufacturers Association low-noise-rated step-up transformers associated with the CTGs and the STG, combined with the use of fire walls and acoustical barriers, if required, to further reduce offsite transformer noise levels.

Adjustments to this mitigation will occur through final design, eliminating or modifying features as appropriate while maintaining sound level commitments. During final design, the noise analysis will be updated to reflect final design conditions and confirm that the Facility has been adequately designed to meet the results as reflected in this Application.

(e) Existing Ambient Conditions

A series of ambient sound level measurements were conducted to document the existing sound environment in the vicinity of this proposed Facility. Baseline sound level measurements were performed on December 13 and 14, 2016. The measurement locations were selected to be representative of potential noise-sensitive areas near the Facility Site in the principal geographical directions. The ambient sound survey consisted of short-term measurements in the presence of an acoustics expert. The measurements were conducted for a minimum duration of 30 minutes at five short-term measurement locations (ML-1 through ML-5) shown in Figure 08-2 and presented in Table 08-3. The short-term measurements were collected during both daytime (10:00 a.m. to 4:00 p.m.) and nighttime (11:00 p.m. to 3:00 a.m.) periods. The results of the baseline sound survey are shown in Table 08-4. Details of the measurements are provided in Appendix H.

TABLE 08-3
BASELINE SOUND MONITORING LOCATIONS

Location	Land Use	Coordinates (UTM[a] Zone 17 N)		Description
		Easting (meters)	Northing (meters)	
ML-1	Residential	454118	4421278	Seneca Lane, north of the Facility Site
ML-2	Residential	455166	4420105	Vocational Road, southeast of the Facility Site
ML-3	Residential	453909	4419407	Nixon Street, south of the Facility Site
ML-4	Residential	453510	4419635	Walnut Street, south-southwest of the Facility Site
ML-5	Residential	453008	4420937	Marietta Road, west of the Facility Site

[a]UTM = Universal Transverse Mercator.

TABLE 08-4
AMBIENT SOUND MONITORING RESULTS

Location	Time Period	Sound Level (L_{eq}[a], dBA)
ML-1	Day	48
	Night	37
ML-2	Day	57
	Night	46
ML-3	Day	46
	Night	35
ML-4	Day	49
	Night	36
ML-5	Day	63
	Night	32

(4) Water

No significant impact to water bodies are anticipated as a result of the Facility. The Facility will have a maximum water demand of approximately 570,000 gpd, and a maximum discharge of approximately 423,000 gpd. Water for the Facility will be supplied via the Village of Byesville Water Department, and wastewater will be returned to the Village of Byesville WWTP. The

Facility water balance, presented in Figures 03-5A and B, indicates the anticipated water requirements and wastewater output under different operation scenarios.

Stormwater will be treated on-site through a settling and detention basin prior to discharge of storm flows. Stormwater features and calculations are provided in Appendix B.

(a) Construction and Operation Impacts

The Facility intends to obtain all water needs during Facility commissioning, startup, and operation from the Village of Byesville Water Department. Water will be routed from the Village of Byesville to an on-site treatment plant for treatment prior to use at the Facility. Adequate water supply is available from the Village of Byesville; correspondence confirming the Facility's needs can be met without constraining other users is provided in Appendix A.

Known public and private groundwater wells and Ohio EPA-designated protection areas to preserve drinking water sources in areas surrounding the Project Area are shown on Figure 08-3. The Facility is not anticipated to have an influence on any potential private well use in the area, as no groundwater will be used by the Facility, and spill prevention and control practices and will be designed and implemented for the Facility to prevent potential contamination of groundwater.

Based on the distance of the wells from the Facility Site and use of BMPs for chemical use, handing, and storage during construction and operation, the potential to impact public or private water supplies is expected to be extremely low. In addition to design measures, staff will receive training on emergency procedures to ensure prompt and efficient response in the event of an accidental release to the environment.

(b) Impact of Pollution Control Equipment Failure

No impact to public or private water supplies is anticipated as a result of water pollution control equipment failures. Non-point source water pollution controls to be used at the Facility Site consist of an oil/water separator for in-plant treatment of floor drains and equipment washdown areas, and containment devices around aboveground storage tanks and station transformers (outdoors). The oil/water separator will be regularly maintained to ensure good operating condition. The containment devices will be designed to collect stormwater. After completion of a visual inspection to ensure no oil sheen, collected stormwater will be released through the stormwater discharge system.

(c) Proximate Water Sources

Figures 08-3 and 08-4 present the location of known water wells and drinking water source protection areas proximate to the Facility Site and the Laydown and Parking Area. No water wells are mapped as being located on-site. The closest mapped water wells are three wells located west of the Facility Site along Seneca Lane. The Facility Site is located approximately 1.9 miles southwest of a drinking water source protection area and the public water system wells in Byesville, and approximately 2.3 miles north of a drinking water source protection area in the Village of Pleasant City. The Facility intends to utilize water from the Village of Byesville, and has no plans to develop an on-site groundwater well.

Figure 08-4 presents a portion of a map entitled "Ground Water Resources for Guernsey County" (Ohio Department of Natural Resources [ODNR] 1991). This map illustrates the groundwater resources throughout the county, as well as in the immediate vicinity of the Facility Site. As shown in Figure 08-4, the Facility Site is situated in an area

where groundwater yields are anticipated to be less than 3 gallons per minute. Groundwater yields are not anticipated to be impacted by the construction or operation of the Facility.

(d) Compliance with Water Source Protection Plans

Construction and operation of the Facility will not impact any drinking water sources, as the Facility will employ BMPs for stormwater management to ensure that water quality standards are met and erosion and sedimentation will be minimized. In the event blasting is required, a licensed professional will conduct the blasting activities in accordance with BMPs. Employing BMPs will ensure safety and mitigate impacts to area water sources.

(e) Potential for Flooding

Eastern and southern portions of the Facility Site are located within the 100-year flood area (Federal Emergency Management Agency [FEMA] Special Flood Hazard Area Zone AE) as identified in Figure 08-5. The northeastern corner of the Facility footprint is also within the 100-year flood area. The base flood elevation in the FEMA flood zone AE on the Facility Site is 802 feet. Upon construction commencement, the Facility Site will be graded to a base elevation of 822 feet, which will situate the Facility well above the base flood elevation. A portion of the Laydown and Parking Area is also in the 100-year flood area (FEMA flood zone A); appropriate flood protection will be designed for stored equipment.

(5) Geological Features

(a) Site Geology

Figure 08-3 presents the USGS 7.5-minute series topographic map of Byesville, overlain with the following features: the proposed Facility Site and Laydown and Parking

Area; geologic features; topographic contours; existing gas and oil wells; and injection wells.

Guernsey County is located within the Central and Western Allegheny Plateau areas, characterized by the presence of extensive drainageways, and moderately steep to very steep hillsides and relatively narrow valleys. Although the Illinoian and Wisconsinan glacier moved within 50 miles north and west of Guernsey County, no glacial outwash deposits are found in unglaciated southeastern Ohio. The Project Area is underlain by bedrock of the Pennsylvanian strata, deposited about 302 and 307 million years ago. The bedrock is of continental and marine origin and consists of sedimentary rocks, more specifically consisting of shale, sandstone, siltstone, mudstone, limestone, and coal. A preliminary geotechnical investigation, presented in Appendix I, was completed to determine the suitability of the geology for the proposed Facility. According to the investigation, portion of the Facility Site are underlain by extensive underground workings from coal mining operations that are no longer active.

(b) Soils and Soil Suitability

Based on review of the United States Department of Agriculture's Natural Resources Conservation Service (NRSC) publicly available data, the soil units within the Project Area are shown on Figure 08-6. The soils include Gilpin silt loam, 15 to 25% slopes (GdD); Glenford silt loam, 0 to 3% slopes (GnA); McGary silt loam, 0 to 3% slopes (McA); Mentor silt loam, 2 to 8% slopes (MeB); Mentor silt loam, 8 to 15% slopes (MeC); Mentor silt loam, 15 to 25% slopes (MeD); Nolin silt loam, 0 to 3% slopes, frequently flooded (No); Sarahsville silty clay loam, frequently flooded (Sa); Zipp silty clay loam, ponded (Zs). According to the Soil Survey, water composes approximately 6 acres (4%) of

the Project Area. Additional detail on each soil is provided below in order of prevalence within the Project Area.

GnA, which covers approximately 30.3 acres (23%) of the Project Area, is a moderately well-drained soil located on terraces. The down-slope and across-slope shapes are convex or linear. The parent material consists of silty lacustrine deposits. The depth to a restrictive feature is more than 80 inches. The capacity of the most limiting layer to transmit water is moderately low to moderately high (0.01 to 0.28 inches per hour). The depth to the water table is about 15 to 24 inches. The soil is not subject to flooding or ponding. The available water storage in the soil profile is very high (about 12.3 inches).

MeB, which covers approximately 26.1 acres (20%) of the Project Area, is a well-drained soil located on terraces. The down-slope shape is convex and the across-slope shape is linear. The parent material is lacustrine deposits. The depth to a restrictive feature is more than 80 inches. The runoff class is medium. The capacity of the most limiting layer to transmit water is moderately high to high (0.60 to 2.00 inches per hour). The depth to the water table is about 48 to 72 inches. The soil is not subject to flooding or ponding. The available water storage in the soil profile is high (about 11.3 inches).

McA, which covers approximately 20.3 acres (15%) of the Project Area, is a somewhat poorly drained soil located on terraces. The down-slope shape is concave, and the across-slope shape is linear. The parent material consists of lacustrine deposits. The depth to a restrictive feature is more than 80 inches. The runoff class is high. The capacity of the most limiting layer to transmit water is low to moderately low (0.01 to 0.06 inches per hour). Depth to the water table is about 6 to 18 inches. The soil is not subject to flooding or ponding. The available water storage in the profile is high (about 9.5 inches).

Sa, which covers approximately 15.4 acres (12%) of the Project Area, is a somewhat poorly drained soil located on floodplains and terraces. The down-slope shape is concave and the across-slope shape is linear. The parent material is lacustrine deposits. The depth to a restrictive feature is more than 80 inches. The runoff class is very high. The capacity of the most limiting layer to transmit water is low to moderately low (0.01 to 0.06 inches per hour). The depth to the water table is 12 to 30 inches. The soil is subject to frequent flooding, but is not subject to ponding. The available water storage in the soil profile is moderate (about 8.7 inches).

MeC, which covers approximately 13.5 acres (10%) of the Project Area, is a well-drained soil located on terraces. The down-slope shape is convex and the across-slope shape is linear. The parent material consists of lacustrine deposits. The depth to a restrictive feature is more than 80 inches. The runoff class is medium. The capacity of the most limited layer to transmit water is moderately high to high (0.60 to 2.00 inches per hour). The depth to the water table is about 48 to 72 inches. The soil is not subject to flooding or ponding. The available water storage in the soil profile is high (about 11.1 inches).

No, which covers approximately 13.8 acres (10%) of the Project Area, is a well-drained soil located on floodplains. The down-slope and across-slope shapes are linear. The parent material is fine-silty alluvium derived from sedimentary rock. The depth to a restrictive feature is more than 80 inches. The capacity of the most limiting layer to transmit water is moderately high to high (0.57 to 1.98 inches per hour). The depth to the water table is more than 80 inches. The soil is subject to frequent flooding, but is not subject to ponding. The available water storage in the soil profile is very high (about 12.6 inches).

Zs, which covers approximately 4.8 acres (4%) of the Project Area, is a very poorly drained soil located on floodplains. The parent material consists of lacustrine deposits. The depth to a restrictive feature is more than 80 inches. The runoff class is high. The capacity of the most limiting layer to transmit water is low to moderately high (0.01 to 0.20 inches per hour). The depth to the water table is 0 to 6 inches. The soil is subject to frequent flooding and ponding. The available water storage in the soil profile is moderate (about 7.5 inches).

GdD, which covers approximately 2.9 acres (2%) of the Project Area, is a well-drained soil located on hillslopes. The down-slope shape is convex, and the across-slope shape is convex or linear. The parent material consists of residuum weathered from sandstone and siltstone. The depth to a restrictive feature is 25 to 37 inches to a weathered layer of bedrock. The capacity of the most limiting layer to transmit water is moderately high to high (0.20 to 2.00 inches per hour). The depth to the water table is more than 80 inches. The soil is not subject to flooding or ponding. The available water storage in the soil profile is low (about 4.8 inches).

MeD, which covers approximately 0.3 acres (less than 1%) of the Project Area, is a well-drained soil located on terraces. The down-slope and across-slope shapes are linear. The parent material is lacustrine deposits. The depth to a restrictive feature is more than 80 inches. The runoff class is medium. The capacity of the most limited layer to transmit water is moderately high to high (0.60 to 2.00 inches per hour). The depth to the water table is about 48 to 72 inches. The soil is not subject to flooding or ponding. The available water storage in the soil profile is high (about 11.1 inches).

Table 08-5 presents a summary of the soil properties and characteristics as provided in the Soil Survey.

TABLE 08-5
SOIL PROPERTIES AND CHARACTERISTICS

Soil Series	Depth Below Surface (inches)	Permeability (inches per hour)	Soil pH	Potential Frost Action	Shrink-Swell Potential
GnA	0 – 10 10 – 40 40 – 57 57 – 80	0.60 – 0.20 0.20 – 2.00 0.20 – 0.60 0.20 – 2.00	4.5 – 7.3 4.5 – 6.0 5.6 – 7.3 5.6 – 7.8	High	Low Moderate Low Low
MeB	0 – 7 7 – 52 52 – 80	0.60 – 2.00 0.60 – 2.00 0.60 – 2.00	4.5 – 6.0 4.5 – 6.5 5.1 – 7.8	High	Low Low Low
McA	0 – 9 9 – 36 36 – 80	0.60 – 2.00 0.06 – 0.60 0.01 – 0.06	5.6 – 7.3 4.5 – 7.8 7.4 – 8.4	High	Low High Moderate
Sa	0 – 9 9 – 42 42 – 80	0.20 – 0.60 0.00 – 0.06 0.00 – 0.06	5.1 – 7.3 5.1 – 7.3 5.6 – 7.6	High	Moderate High High
MeC	0 – 7 7-48 48 – 80	0.60 – 2.00 0.60 – 2.00 0.60 – 2.00	4.5 – 6.0 4.5 – 6.5 5.1 – 7.8	High	Low Low Low
No	0 – 11 11 – 41 41 – 80	0.60 – 2.00 0.60 – 2.00 0.60 – 6.00	5.6 – 8.4 5.6 – 8.4 5.1 – 8.4	High	Low Low Low
Zs	0 – 8 8 – 48 48 – 80	0.20 – 0.60 0.06 – 0.20 0.00 – 0.20	5.6 – 7.3 5.6 – 7.3 6.6 – 7.8	Moderate	Moderate High High
MeD	0 – 7 7 – 48 48 – 80	0.60 – 2.00 0.60 – 2.00 0.60 – 2.00	4.5 – 6.0 4.5 – 6.5 5.1 – 7.8	High	Low Low Low
GdD	0 – 6 6 – 26 26 – 30 30 – 35	0.60 – 2.00 0.60 – 2.00 0.60 – 2.00 0.20 – 2.00	3.6 – 5.5 3.6 – 5.5 3.6 – 5.5 -	Moderate	Low Low Low -

As previously noted, a preliminary geotechnical investigation has been completed on the Project Area (provided in Appendix I) to determine the suitability of the subsurface

soil for construction of the proposed Facility. The investigation indicated the ground cover consisted of 2 to 8 inches of root mat and topsoil. Residual soils in the Project Area are derived through physical and chemical weathering of the underlying rock. The preliminary investigation did not note any inadequacies in the Facility Site soil suitability.

(c) Geotechnical Evaluation Plan

A preliminary geotechnical investigation, provided as Appendix I, has been completed for the Facility. The preliminary geotechnical investigation was performed in November 2016 to identify the subsurface stratigraphy underlying the Facility Site, and to evaluate the geotechnical properties of the materials encountered.

Five test borings at the Facility Site were drilled to a minimum of 150 feet below the existing ground surface. The Standard Penetration Test (SPT), split-spoon sampling, and Cone Penetration Test were performed.

The borings encountered 2 to 8 inches of ground cover, which is described as root mat and topsoil. The residual soil substratum was encountered from below the groundcover to a depth of 5 to 16 feet below ground surface (bgs). This layer was visually classified as brown silt and yellowish-brown to grayish-brown lean clay. Based on the SPT N-values, this layer generally exhibits stiff to very stiff consistency. Below the residual layer, the borings encountered a 0- to 10-foot thick layer of disintegrated rock above intact bedrock.

Top of bedrock was encountered at depths ranging from 9 to 26 feet bgs. The test borings encountered beds of sedimentary rock, including sandstone, shale, siltstone, limestone, and coal. All borings were extended to below the abandoned coal mine elevation and into the mine floor rock.

The groundwater level was observed at depths to water of 20 to 49 feet bgs. There was no evidence of base groundwater levels present above top of rock surface during drilling, although there was occasional presence of water above top of rock observed after returning to the borehole after an extended break in drilling, which may be a result of perched water surface above rock that is susceptible to seasonal fluctuations.

The draft boring logs are presented as an appendix in the preliminary geotechnical investigation (Appendix I).

According to "Earthquakes and Seismic Risk" by the ODNR Division of Geologic Survey,[6] earthquake risk in Ohio is difficult to determine due to the infrequency of earthquake occurrences. Ohio is on the edge of the New Madrid Seismic Zone, an area centered in Missouri and extending into adjacent states. While at least 120 earthquakes with epicenters in Ohio have been reported since 1776, the areas of Ohio that are found to be most susceptible to seismic activity are Shelby County and surrounding counties in western Ohio, and Cuyahoga, Lake, Geauga, and Ashtabula Counties in northeastern Ohio.

Southeastern Ohio has been the location of at least 12 felt earthquakes since 1776. According to ODNR, a recent seismic event recorded at a magnitude of 2.3 occurred approximately 4.5 miles north of Barnesville, Ohio, approximately 17 miles northeast of the Facility Site.

Damage to structures during an earthquake is primarily the result of liquefaction of soils. For liquefaction to occur, appreciable sand strata (typically loose and/or saturated) must be present in the subsurface profile. Liquefaction potential due to seismic-induced

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[6] Ohio Department of Natural Resources, Division of Geologic Survey. 2012. "GeoFacts No. 3", May, 2012. http://geosurvey.ohiodnr.gov/portals/geosurvey/PDFs/GeoFacts/geof03.pdf.

motions does not represent a significant risk at the Facility Site since the subsurface profile, as determined by the test borings, is dominated by silty clays at depths ranging from 5 to 16 feet bgs. Therefore, due to the low number of recorded seismic events in the region and the presence of soils not susceptible to liquefaction from seismic events, damage to structures on the Facility Site is considered unlikely.

Based on a review of geological and seismic information, geological issues are not expected to restrict development at the Facility Site.

(6) Potential for High Wind Conditions

The Facility will be constructed to withstand high winds, as appropriate.

(7) Potential Impact from Blade Shear

Since the proposed Facility does not include the installation of any wind turbine equipment, this section is not applicable.

(8) Potential Impact from Ice Throw

Since the proposed Facility does not include the installation of any wind turbine equipment, this section is not applicable.

(9) Potential Impact from Shadow Flicker

Since the proposed Facility does not include the installation of any wind turbine equipment, this section is not applicable.

(10) Potential Impact to Radio and TV Reception

Since the proposed Facility does not include the installation of any wind turbine equipment, this section is not applicable.

(11) Potential Impact to Radar Systems

Since the proposed Facility does not include the installation of any wind turbine equipment, this section is not applicable.

(12) Potential Impact to Microwave Communications

Since the proposed Facility does not include the installation of any wind turbine equipment, this section is not applicable.

(B) ECOLOGICAL RESOURCES

(1) Existing Ecological Resources

(a) Nearby Resources

Figure 08-7 shows the boundary of the Project Area and information including: undeveloped lots or vacant fields; delineated wetlands; surface bodies of water; highly erodible lands; and slopes greater than 12%.

No wildlife areas, nature preserves, or other conservation areas are present in the Project Area or within 0.5 miles of the Project Area boundaries. The closest such areas are more than 2 miles from the Facility Site. The 76-acre Dan and Margaret James Wildlife Area is located approximately 2.6 miles northeast of the Facility Site and provides opportunities for hunting, trapping, and bird watching. The Senecaville State Fish Hatchery is located just over 5 miles east of the Facility Site.

Figure 08-7 indicates the presence of limited highly erodible land in the Project Area, associated with areas of MeC, MeD, and GdD soils.

A discussion of surface waterbodies and wetland areas identified in Figures 08-8A through C is provided in Section 4906-04-08 (B)(1)(b) below.

(b) Vegetation, Wetland and Surface Water Survey

A wetland delineation and stream identification survey was conducted within the Project Area in July 2016. As shown in Figures 08-8A through C, the field investigation identified and delineated 20 resource areas as wetlands within the Project Area that exhibit

the wetland criteria identified in the United States Army Corps of Engineers (USACE) Wetland Delineation Manual[7] as amended by the Regional Supplement to the USACE Wetland Delineation Manual: Eastern Mountains and Piedmont Region, April 2012,[8] as well as the Ohio EPA's Ohio Rapid Assessment Method for Wetlands (ORAM).[9] The delineation identified 15 Palustrine Emergent (PEM), three Palustrine Emergent/Palustrine Forested (PEM/PFO), and two Palustrine Unconsolidated Bottom (PUB) wetlands within the Project Area. Most of these wetlands exist along the edges of active pastureland or are associated with Wills Creek. The majority of these wetlands are of medium quality (Modified Category 2) per the ORAM.

Wills Creek is the single perennial stream identified, and is located just to the south and west of the Project Area. Wills Creek is a named perennial tributary to the Muskingum River, flowing west along the southern boundary of the Facility Site. This watercourse is supported by groundwater, numerous upstream tributaries, precipitation, and surficial runoff from adjacent uplands. The stream channel is approximately 60 feet in width and contains a gravel, sand, and silt substrate. The stream displayed low flow at the time of field investigations.

Details characterizing the wetlands and perennial stream identified within the Project Area are provided in Appendix J.

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[7] Environmental Laboratory, US Army Corps of Engineers Waterways Experiment Station 1987. "Technical Report Y-87-1" January 1987.

[8] United States Army Corps of Engineers, Wetlands Regulatory Assistance Program 2012. "Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region (Version 2.0) April 2012.

[9] Mack, John J. 2001. Ohio Rapid Assessment Method for Wetlands for Using Version 5.0. Ohio EPA Technical Bulletin Wetland February 1, 2001. Ohio Environmental Protection Agency, Division of Surface Water, 401 Wetland Ecology Unit, Columbus, Ohio.

A survey was conducted of representative plant species present in the Project Area. The entire Project Area east of the railroad track was surveyed. The majority of the surveyed Project Area is either active pastureland or managed hayfield. Adjacent areas included residential lawns, upland fallow fields, managed agricultural fields, maintained utility ROWs, forested upland patches, and palustrine emergent, scrub-shrub, and forested wetland plant communities. Vegetative species data was recorded for the tree overstory, shrub understory, woody vines, and ground cover strata. The tree overstory stratum includes woody vegetation capable of growing to greater than 20 feet in height, while the shrub understory includes woody vegetation between 3 and 20 feet in height. The ground cover stratum includes all non-woody vegetation less than 6 feet in height. The woody vine stratum includes woody vines that are greater than 3 feet in height. Comprehensive lists of plant species, separated by plant community, are provided in Tables 08-06, 08-07, and 08-08.

TABLE 08-6
VEGETATION RECORDED WITHIN FORESTED UPLAND PATCHES

Common Name	Latin Binomial
Agrimony	*Agrimonia parviflora*
Allegheny Blackberry	*Rubus allegheniensis*
American Sycamore	*Platanus occidentalis*
Autumn Olive	*Elaeagnus umbellata*
Bitter Dock	*Rumex obtusifolius*
Black Cherry	*Carya ovate*
Black Locust	*Robinia pseudoacacia*

Common Name	Latin Binomial
Black Raspberry	*Rubus occidentalis*
Box Elder	*Acer negundo*
Christmas Fern	*Polystichum acrostichoides*
Cleavers	*Galium aparine*
Common Cinquefoil	*Potentilla simplex*
Common Dandelion	*Taraxacum officinale*
Common Wintercress	*Barbarea vulgaris*
Garlic Mustard	*Alliaria petiolata*
Green Ash	*Fraxinus pennsylvanica*
Ground Ivy	*Glechoma hederacea*
Hawthorn Species	*Crataegus spp.*
Japanese Barberry	*Berberis thunbergii*
Japanese Honeysuckle	*Lonicera japonica*
Japanese knotweed	*Polygonum cuspidatum*
Jewelweed	*Impatiens capensis*
Multiflora Rose	*Rosa multiflora*
Osage orange	*Maclura pomifera*
Path Rush	*Juncus tenuis*
Poison Ivy	*Toxicodendron radicans*
Pokeweed	*Phytolacca americana*
Purple Dead Nettle	*Lamium purpereum*
Red Maple	*Acer rubrum*
Red Oak	*Quercus rubra*

Common Name	Latin Binomial
Reed Canary Grass	*Phalaris arundinacea*
Riverbank Wildrye	*Elymus riparius*
Shagbark Hickory	*Carya ovata*
Silver Maple	*Acer saccharinum*
Slippery Elm	*Ulmus rubra*
Stinging Nettle	*Urtica dioica*
Sugar Maple	*Acer saccharum*
Tartarian Honeysuckle	*Lonicera tatarica*
Tree of Heaven	*Ailanthus altissima*
Unidentified Grape	*Vitis sp.*
Unidentified Grass	*Poaceae sp.*
Virginia Creeper	*Parthenocissus quinquefolia*
White Avens	*Geum canadense*
Wild Onion	*Allium cernuum*
Stinging Nettle	*Urtica dioica*
Corn Salad	*Valerianella olitoria*
Common Blue Violet	*Viola papilionacea*
Fox Grape	*Vitis labrusca*
Unidentified Grape	*Vitis sp.*

TABLE 08-7
VEGETATION RECORDED WITHIN RESIDENTIAL LAWNS, MAINTAINED UTILITY ROWS, UPLAND FIELDS, MANAGED AGRICULTURAL AREAS, AND ACTIVE PASTURES

Common Name	Latin Binomial
Allegheny Blackberry	*Rubus allegheniensis*
Bitter Dock	*Rumex obtusifolius*
Black Raspberry	*Rubus occidentalis*
Canada Goldenrod	*Solidago Canadensis*
Canada Thistle	*Cirsium arvense*
Chicory	*Cichorium intybus*
Coltsfoot	*Tussilago farfara*
Common Chickweed	*Stellaria media*
Common Cinquefoil	*Potentilla simplex*
Common Dandelion	*Taraxacum officinale*
Common Milkweed	*Asclepias syriaca*
Common Mugwort	*Artemisia vulgaris*
Common Plantain	*Plantago major*
Common Ragweed	*Ambrosia artemisiifolia*
Common Wintercress	*Barbarea vulgaris*
Common Yarrow	*Achillea millefolium*
Crown Vetch	*Securigera varia*
Eastern Daisy Fleabane	*Erigeron annuus*
English Plantain	*Plantago lanceolata*
Field Fescue	*Festuca pratensis*

Common Name	Latin Binomial
Garlic Mustard	*Alliaria petiolate*
Green Headed Coneflower	*Rudbeckia laciniata*
Ground Ivy	*Glechoma hederacea*
Groundsel	*Senecio vulgaris*
Horse Nettle	*Solanum carolinense*
Indian Hemp Dogbane	*Apocynum cannabinum*
Jimson Weed	*Datura stramonium*
Mullein	*Verbascum Thapsus*
Multiflora Rose	*Rosa multiflora*
Onion Grass	*Allium cernuum*
Orchard grass	*Dactylis glomerata*
Path Rush	*Juncus tenuis*
Poison Ivy	*Toxicodendron radicans*
Pokeweed	*Phytolacca Americana*
Poverty Grass	*Danthonia spicata*
Purple Dead Nettle	*Lamium purpereum*
Queen Anne's Lace	*Daucus carota*
Red Clover	*Trifolium pretense*
Redtop	*Agrostris gigantean*
Reed Canarygrass	*Phalaris arundinacea*
Shepherd's Purse	*Capsella bursa-pastoris*
Small-flowered Agrimony	*Agrimonia parviflora*
Small-flowered Bittercress	*Cardamine parviflora*

Common Name	Latin Binomial
Soft Rush	*Juncus effuses*
Tall Goldenrod	*Solidago altissima*
Tall Ironweed	*Vernonia angustifolia*
Timothy	*Phleum pratensis*
Unidentified Grape	*Vitis sp.*
Unidentified Grass	*Poaceae sp.*
White Avens	*Geum canadense*
White Clover	*Trifolium repens*
Wild Onion	*Allium cernuum*
Wood Strawberry	*Fragaria vesca*
Yellow Foxtail	*Setaria pumila*

TABLE 08-8
VEGETATION RECORDED WITHIN EMERGENT, SCRUB-SHRUB, AND FORESTED WETLANDS

Common Name	Latin Binomial
Allegheny Blackberry	*Rubus allegheniensis*
American Burr-reed	*Sparganium americanum*
Annual Ragweed	*Ambrosia artemisiifolia*
Beggars Ticks	*Bidens sp.*
Black Willow	*Salix nigra*
Box Elder	*Acer negundo*
Canadian Clearweed	*Pilea pumila*
Chufa	*Cyperus esculentus*

Common Name	Latin Binomial
Colt's-Foot	*Tussilago farfara*
Common Boneset	*Eupatorium perfoliatum*
Common Elderberry	*Sambucus nigra var. Canadensis*
Common Timothy	*Phleum pretense*
Common Wintercress	*Barberea vulgaris*
Corn Salad	*Valerianella olitoria*
Cottengrass Bulrush	*Scirpus cyperinus*
Curly Dock	*Rumex crispus*
Dark-Green Bulrush	*Scirpus atrovirens*
Fox Sedge	*Carex vulpinoidea*
Franks Sedge	*Carex frankii*
Garlic Mustard	*Alliaria petiolate*
Green Ash	*Fraxinus pennsylvanica*
Green-Head Coneflower	*Rudbeckia laciniata*
Ground Ivy	*Glechoma hederacea*
Indian Hemp	*Apocynum cannabinum*
Japanese Stilt Grass	*Microstegium vimineum*
Jewelweed	*Impatiens capensis*
Large Barnyard Grass	*Echinochloa crus-galli*
Lesser Poverty Rush	*Juncus tenuis*
Lurid Sedge	*Carex lurida*
Mild Water-Pepper	*Persicaria hydropiper*
Moneywort	*Lysimacchia nummularia*

Common Name	Latin Binomial
Multiflora Rose	*Rosa multiflora*
Osage Orange	*Maclura pomifera*
Pennsylvania Bittercress	*Cardamine pensylvanica*
Poison Ivy	*Toxicodendron radicans*
Purple-leaved Willowherb	*Epilobium coloratum*
Red Clover	*Trifolium pratense*
Red Oak	*Quercus rubra*
Red Osier Dogwood	*Cornus sericea*
Redtop	*Agrostis gigantean*
Reed Canarygrass	*Phalaris arundinacea*
Rice Cut Grass	*Leersia oryzoides*
Rough Goldenrod	*Solidago rugose*
Sensitive Fern	*Onoclea sensibilis*
Silky Dogwood	*Cornus amomum*
Silver Maple	*Acer saccharinum*
Single-Vein Sweetflag	*Acorus calamus*
Skunk Cabbage	*Symplocarpus foetidus*
Slippery Elm	*Ulmus rubra*
Small-flowered Agrimony	*Agrimonia parviflora*
Smartweed	*Polygonum sp.*
Soft Rush	*Juncus effuses*
Spearmint	*Mentha spicata*
Spring Cress	*Cardamine bulbosa*

Common Name	Latin Binomial
Sweet Scented Joe-Pye-Weed	*Eutrochium purpureum*
Unidentified Grass	*Poaceae spp.*
Unidentified Sedge	*Carex sp.*
White Avens	*Geum canadense*
White Grass	*Leersia virginica*
Wild Onion	*Allium cernuum*
Wingstem	*Verbesina alternifolia*
Yellow Pond Lily	*Nuphar advena*

Active pasture and routinely managed hayfield comprise the majority of the Project Area. The upland portions of the active pastureland and hayfield are predominantly populated by various grass species (*Poaceae* species), red clover (*Trifolium pretense*), white clover (*Trifolium repens*), chicory (*Cichorium intybus*), horse nettle (*Solanum carolinense*), common ragweed (*Ambrosia artemisiifolia*), multiflora rose (*Rosa multiflora*), and Allegheny blackberry (*Rubus allegheniensis*). Maintained residential lawns, fallow field, managed agricultural, upland forested patches, and wetland vegetative communities abut the active pasture and hay fields. The upland lawns or fields predominantly include various grass species, red clover, white clover, Queen Anne's lace (*Daucus carota*), common dandelion (*Taraxacum officinale*), yarrow (*Achillea millefolium*), multiflora rose, and Allegheny blackberry.

Small patches of upland forest habitat occur in the north-central portion of the Project Area, and as a tree line along the riparian edge of Wills Creek. These wooded habitats only comprise a small portion of the Project Area. The wooded areas within the

Project Area consisted of oak-maple complexes that included (*Quercus rubra*), red maple (*Acer rubrum*), black cherry (*Prunus serotina*), Osage orange (*Maclura pomifera*), and unidentified hawthorn species (*Crataegus* species). The canopy throughout the Project Area was typically open with understory often dominating. The understory included multiflora rose, Tartarian honeysuckle (*Lonicera tatarica*), Allegheny blackberry, and black raspberry (*Rubus occidentalis*). Though some variations in amount of overstory and understory occur in each of the specific forested patches, the patches consisted primarily of similar species and tree size.

The upland forested riparian corridor canopies present along Wills Creek were comprised of a mix of silver maple (*Acer saccharinum*), American sycamore (*Platanus occidentalis*), black willow (*Salix nigra*), and green ash (*Fraxinus pennsylvanica*) in the overstory. The understory was comprised of box elder (*Acer negundo*), Tartarian honeysuckle, with grape (*Vitis* species), Japanese knotweed (*Polgonum cuspidatum*), Allegheny blackberry, and black raspberry present.

The dominant vegetation within these PEM wetlands identified in the wetland delineation included large barnyard grass (*Echinochloa crus-galli*), lamp rush (*Juncus effusus*), black bent/redtop (*Agrostis gigantea*), rice cut grass (*Leersia oryzoides*), various unidentified sedge species (*Carex* sp.), and various unidentified grass species (*Poaceae* sp.). Two of the PEM wetlands (Wetlands W-C36 and W-C37 on Figures 08-8B and C) contained inclusions of deep water habitat. These two wetlands contained a slightly different composition of dominant vegetation, which included among its dominants yellow pond lily (*Nuphar advena*) and American burr-reed (*Sparganium americanum*).

The tree stratum of the PEM/PFO wetlands were dominated by silver maple, black willow, osage-orange, ash leaf maple, and green ash. The shrub or understory of these wetlands were dominated by silver maple, black willow, and ash leaf maple. Dominant herbaceous vegetation within these wetlands included single-vein sweetflag (*Acorus calamus*), reed canary grass (*Phalaris arundinacea*), Japanese stilt grass (*Microstegium vimineum*), rice cut grass (*Leersia oryzoides*), and Canadian clearweed (*Pilea pumila*).

(c) Species Literature Survey

Endangered or Threatened Species

The United States Fish and Wildlife Service (USFWS) and ODNR were contacted regarding the potential presence of any sensitive natural communities or rare or endangered species in the vicinity of the Project Area. Responses were received from USFWS on August 17, 2016 and from ODNR on August 2, 2016 and September 16, 2016 (Appendix K).

The response letter from USFWS stated that there are no federal wilderness areas, wildlife refuges, or designated critical habitat within the vicinity of the Project Area. The letter noted that all projects in the State of Ohio lie within the range of both the federally endangered Indiana bat (*Myotis sodalis*) and the federally threatened northern long-eared bat (*Myotis septentrionalis*).

Limited Indiana bat and northern long-eared bat habitat – standing dead or dying trees with exfoliating bark – do occur within the Project Area and adjoining areas. Trees are widely spaced within the Facility Site, comprising a total of approximately one acre of trees to be cleared (Figure 08-9). Restricting tree clearing to the winter months (between October 1 and March 31), when Indiana bats and northern long-eared bats are not using

roost trees, provides a safeguard against any potential impact to the Indiana bat and the northern long-eared bat.

The ODNR confirmed in its September 16, 2016 response letter that no records exist in their database of unique ecological sites, geologic features, animal assemblages, scenic rivers, state wildlife areas, state nature preserves, state parks or national parks, state or national forests, national wildlife refuges, or rare or endangered species within one mile of the Project Area. ODNR also provided comments in its September 16, 2016 correspondence noting the same bat issues identified by USFWS and identifying that the Facility is also within the range of the northern harrier (*Circus cyaneus*), a state endangered bird. This is a common migrant and winter species. Nesters are much rarer, although they occasionally breed in large marshes and grasslands. The northern harrier can be found nesting in many kinds of open terrain where there is good ground cover. Based upon the field evaluation, only one area within the Facility Site would be potentially suitable for northern harrier nesting and breeding, which is Wetland W-C28 (shown on Figures 08-8A and 08-8B). Wetland W-C28 is an approximately 9.5-acre densely vegetated grass- and sedge-dominated wetland that is located along the eastern boundary of the Facility Site. No impact to this wetland is currently planned; retaining walls will be incorporated to eliminate the need for grading in this wetland. Therefore, no impact is anticipated to northern harrier nesting areas; development of the Facility will eliminate approximately 25 acres of potential hunting habitat for this species.

The ODNR also identified that the Facility is within the range of the black bear (*Ursus americanus*), a state endangered species. Due to the mobility of this species, the ODNR determined that the Facility is not likely to impact this species.

Freshwater native mussels were also identified by ODNR as a potential issue. Wills Creek is a Group 1 Stream, as designated by Appendix A of the Ohio Mussel Stream List (Updated 4/15/2016). Group 1 streams are categorized as small- to mid-sized streams where federally listed mussel species are not expected to occur. In addition, at this time, no in-water disturbances are anticipated to occur as a result of the proposed Facility activities. Since no in-water work is anticipated, the Facility is not likely to impact aquatic species or federally listed mussel species. Should this change, appropriate surveys would be conducted and appropriate seasonal restrictions implemented as necessary.

Recreational or Commercial Species

Based on observation of the Project Area and the surrounding residential, agricultural, and pasture land use, limited recreational or commercial species are likely to be present. Terrestrial game species anticipated to utilize the Project Area include white-tail deer, wild turkey, cottontail rabbit, and mourning dove.

White-tail deer, wild turkey, and cottontail rabbits are opportunistic foragers and are able to travel to find food sources. The proposed Project Area is largely comprised of active cattle pastureland that, due to extreme grazing, have left these areas less suitable for foraging than other adjacent fields and forests. The percentage of suitable foraging habitat in the local area should not be drastically reduced to the degree that would affect the populations of these species.

Mourning doves breed in areas of shrubs and small trees, habitats that will largely remain undisturbed. Mourning doves forage for seeds in open fields and, although the Facility will affect open fields, the percentage lost in the local area is small and should not reduce foraging habitat to a degree that would affect the mourning dove population.

(d) Species Field Survey

An assessment of wildlife species and habitat was conducted during Project Area visits from July to December 2016. Wildlife species were identified by visual and auditory observations, tracks, necropsy, dwellings or burrows, scat, or other clear evidential indicators. Table 08-9 lists wildlife species observed during field investigations. Cover types within the Project Area and surroundings are managed agriculture; active pasturelands; forested upland and riparian corridors; developed (residential and transportation); and wetland; most of these cover types provide limited or moderate quality wildlife habitat.

TABLE 08-9
WILDLIFE SPECIES OBSERVED ON AND ADJACENT TO THE PROJECT AREA

Common Name	Latin Binomial	Observation
American Crow	*Corvus brachyrhynchos*	Visual
American Robin	*Turdus migratorius*	Visual
Blue Jay	*Cyanocitta cristata*	Visual
Canada Goose	*Branta canadensis*	Visual, Auditory
Cottontail Rabbit Species	*Sylvilagus sp.*	Visual, Scat
Coyote	*Canis latrans*	Tracks, Scat
Eastern Chipmunk	*Tamias striatus*	Visual
Eastern Newt	*Notophthalmus viridescens*	Visual
European Starling	*Sturnus vulgaris*	Visual
Field Sparrow	*Spizella pusilla*	Auditory
Fowlers Toad	*Bufo fowleri*	Visual

Common Name	Latin Binomial	Observation
Frogs/Tadpoles Species	*Rana spp.*	Visual, Auditory
Grey Squirrel	*Sciurus carolinensis*	Visual
Muskrat	*Ondatra zibethicus*	Necropsy
North American Beaver	*Castor canadensis*	Den, Dams, Chewed Trees
Northern Cardinal	*Cardinalis*	Auditory, Visual
Northern Mockingbird	*Mimus polyglottos*	Auditory, Visual
Raccoon	*Procyon lotor*	Tracks, Necropsy
Red-eared Slider	*Trachemys scripta elegans*	Visual
Red-tailed Hawk	*Buteo jamaicensis*	Visual, Auditory
Turkey Vulture	*Cathartes aura*	Visual
Vole Species	*Arvicolinae sp.*	Visual, Burrows
White-tailed Deer	*Odocoileus virginianus*	Visual, Tracks, Scat
Wild Turkey	*Meleagris gallopavo*	Visual
Woodchuck	*Marmota monax*	Burrow

Avian species may utilize the Project Area for foraging during spring and fall migration periods, along with the presence of non-migratory resident species. Patchy forested habitat comprises only a small portion of the Project Area and trees are generally located along the fringes of the Project Area. A thin forested riparian corridor is present along Wills Creek. Common passerines, doves, and corvids would be expected to utilize this type of area for foraging and/or nesting. Representative species that could be found to utilize the Project Area include: house sparrow (*Paser domesticus*); European starling (*Sturnus vulgaris*); song sparrow (*Melospiza melodia*); American robin (*Turdus*

migratorius); mourning dove (*Zenaida macroura*); American crow (*Corvus brachyrhynchos*); blue jay (*Cyanocitta cristata*); red-tailed hawk (*Buteo jamaicensis*); Canada goose (*Branta canadensis*); and duck species (*Branta* species).

Although few mammals or signs of mammals were observed, mammals that reasonably could utilize the Project Area include herbivorous species such as white-tailed deer (*Odocoileus virginianus*), North American beaver (*Castor canadensis*), and woodchuck (*Marmota monax*); carnivorous species such as coyote (*Canis latrans*); and omnivores such as raccoon (*Procyon lotor*), North American opossum (*Didelphis virginiana*), and wild turkey (*Meleagris gallopavo*). The Project Area consists predominantly of pastureland and hayfield with patches of upland forest and provides low quality habitat for mammals.

Red-eared sliders (*Trachemys scripta elegans*), Eastern newt (*Notophthalmus viridescens*), and various unidentified frog and tadpole species (*Rana* sp.) were observed within wetlands containing inclusions of deep water habitat. Other reptile and amphibian species such as eastern garter snake (*Thamnophis sirtalis*) and American toad (*Bufo americanus*) would be expected to occur within the drier portions of the Project Area, while more aquatic species, such as the green frog (*Rana clamitans*), would be expected to potentially inhabit the deep water habitats provided by some of the onsite wetlands. The Project Area is generally composed of pasture and hay fields with a few patches of upland forest, which provides low quality habitat for reptiles and amphibians. The wetland complexes present on the fringe of the Project Area would likely provide moderate quality habitat for reptiles and amphibians.

Unidentified fish species were observed in the portion of Wills Creek that is located along the Facility Site's southern boundary. Aquatic macroinvertebrates (*Ephemerotera* sp., *Trichoptera* sp., and *Plecoptera* sp.) were observed within Wills Creek. Unidentified crayfish species (*Decopoda* sp.) were visually observed within Wills Creek and burrows were observed in some on-site wetlands.

(e) Additional Ecological Studies

No additional ecological studies, beyond the wetland delineation and wildlife and vegetation surveys discussed in the previous sections, are planned.

(2) Potential Construction Impact

(a) Ecological Resource Impact Evaluation

The Facility has been carefully sited to minimize impacts to ecological resources to the fullest extent possible. The Facility's location in a generally open field minimizes the need for tree clearing, and siting has prioritized avoidance of wetland impact. No wetland impact will be associated with temporary activities within the Laydown and Parking Area; within the Facility Site retaining walls will be incorporated to also avoid the need for wetland impact.

Facility construction will result in both temporary and permanent impacts of plants and animals. Temporary impacts to wildlife are likely to result during the construction phase as increased noise levels and human activity may displace wildlife to surrounding habitats. After construction is complete, some displaced wildlife is expected to recolonize the Laydown and Parking Area and those areas of the Facility Site that will remain undeveloped.

Of the total 118 acres that comprise the Facility Site, the Facility footprint will be located on approximately 50 acres. A total of approximately one acre of widely spaced trees will be cleared.

(b) Mitigation

The following measures are proposed to ensure that short- and long-term construction impacts to ecological resources remain insignificant.

- Avoidance of Major Species: Adverse impacts to endangered or threatened species are not anticipated based on correspondence from the USFWS and ODNR, field confirmation that the Project Area habitat is not suitable for federally-listed species, planned seasonal restriction for habitat tree clearing to be protective of Indiana bat or northern long-eared bat, and avoidance of northern harrier nesting habitat. Significant construction impacts are not anticipated on recreational or commercial species.
- Demarcation of surface waters and wetlands: Surface waters and wetland areas will be flagged to protect them from unauthorized entry of construction equipment and material storage or disposal in accordance with applicable regulatory requirements.
- Sediment and Erosion Control: A detailed sediment and erosion control plan will be developed prior to initiating Facility construction. The plan will detail temporary stormwater collection ponds as well as silt fencing or other erosion control devices proposed to limit off-site transport of sediment. In addition, a Notice of Intent will be filed with the Ohio EPA for coverage under the NPDES

General Construction Stormwater Permit. Preliminary information is provided in Appendix B.

- Dust and Particulate Control: During grading activities, dust may be generated as exposed soils dry. Water sprays or other dust suppression methods will be employed on areas of exposed soils to minimize the potential for dust generation.
- Revegetation: Areas of the Project Area temporarily impacted by construction activities will be revegetated as soon as possible following completion of construction to stabilize exposed areas of soil. Species proposed for the seeding will be selected to ensure compatibility and suitability with surrounding agricultural areas. Per comments received from the USFWS (Appendix K), care will be taken to prevent the spread of invasive species through revegetation processes using native plant species.

(3) Potential Operation and Maintenance Impact

(a) Ecological Resource Impact Evaluation

Facility operations are expected to result in a localized increase in lighting and noise in the immediate vicinity of the Facility. Wildlife species are not anticipated to utilize the Facility footprint once development is completed. Within the Project Area, disturbance of the Laydown and Parking Area will be temporary in nature; once construction use is completed, existing wildlife usage is expected to return.

(b) Mitigation

Mitigation measures to protect streams and wetlands from short term and long term operations and maintenance of the Facility include avoidance of wetland impact in

association to the greatest extent possible and providing fencing and/or other protective measures in locations where wetlands will be proximate in accordance with applicable requirements. Stormwater BMPs will be utilized during construction and operation. Herbicide use will be restricted in or near wetland areas.

(c) Post-Construction Monitoring of Wildlife Impacts

The Facility currently has no plans for post-construction monitoring of wildlife impacts.

(C) LAND USE AND COMMUNITY DEVELOPMENT

(1) Land Use

(a) Land Use Mapping

Figures 08-10A and 08-10B illustrate land uses within a one-mile radius of the Facility Site; existing structures; and incorporated areas and populations centers. Land use categories, as identified in OPSB Chapter 4906-04-08 (C)(1)(a)(ii) include: residential; commercial; industrial; institutional; recreational; and agricultural. The land use categories identified in Figure 08-10A were assessed using aerial photography and a general knowledge of the Facility Site and the surrounding area. Land use within one mile of the Facility is predominantly forested/open space and agricultural. A breakdown of land use within one mile of the Facility is provided in Table 08-10.

TABLE 08-10
LAND USE WITHIN ONE MILE OF THE FACILITY

Land Use Type	Approximate Acreage	Percentage of Area (rounded)
Agricultural	1,300	36.6
Commercial	44	1.2
Forested / Open Space	1,598	45.0
Industrial	247	7.0
Institutional	42	1.2
Residential	320	9.0
Total	**3,551**	**100**

(b) Existing Structures

Four existing structures are located within 250 feet of the Facility footprint, as indicated within the yellow boundary on Figure 08-10B and on Table 08-11; three of these structures will be demolished to accommodate the Facility. Fourteen additional existing structures are located within 1,000 feet of the Facility generation equipment and supporting features (including the ACCs, ancillary equipment, storage tank, and the administration building), as indicated within the red boundary on Figure 08-10B and Table 08-11. The majority of the structures identified to the west of I-77 are located beyond the existing railroad line. To the east and on the opposite side of I-77, structures include residences, one non-residential industrial property, and the building associated with the I-77 rest area.

TABLE 08-11
STRUCTURES WITHIN 1,000 FEET AND 250 FEET FROM GENERATING EQUIPMENT AND FACILITY FOOTPRINT

Structure (S-X)	Structure Type	Approximate Distance from Generating Equipment and Supporting Features (up to 1,000 feet)	Distance from Facility Footprint (within 250 feet)	Property being leased by Applicant, option to purchase, or Not Applicable (N/A)
S-1	Residential structure with associated garage	765 feet	-	N/A
S-2	Residential structure with associated garage	870 feet	-	N/A
S-3	Residential structure with associated garage	800 feet	-	N/A
S-4	Residential structure with associated garage	280 feet	-	N/A
S-5	Residential structure	On Facility Site - to be demolished	On Facility Site - to be demolished	Option to purchase
S-6	Residential structure with associated garage	-	150 feet	N/A
S-7	Residential structure with associated garage	On Facility Site - to be demolished	On Facility Site - to be demolished	Option to purchase
S-8	Residential structure	On Facility site - to be demolished	On Facility Site - to be demolished	Option to purchase
S-9	Large storage structure	On Facility Site - to be demolished	On Facility Site - to be demolished	Option to purchase
S-10	I-77 Rest Stop Building	950 feet	-	N/A

Structure (S-X)	Structure Type	Approximate Distance from Generating Equipment and Supporting Features (up to 1,000 feet)	Distance from Facility Footprint (within 250 feet)	Property being leased by Applicant, option to purchase, or Not Applicable (N/A)
S-11	Residential structure with associated garage	900 feet	-	N/A
S-12	Residential structure with associated garage	790 feet	-	N/A
S-13	Residential structure with associated garage	800 feet	-	N/A
S-14	Residential structure with associated garage	690 feet	-	N/A
S-15	Residential structure with associated garage	950 feet	-	N/A
S-16	Residential structure with associated garage	730 feet	-	N/A
S-17	Residential structure with associated garage	860 feet	-	N/A
S-18	Industrial structures	600 feet	-	N/A

(c) Land Use Impacts

Direct land use impacts will occur exclusively in the Project Area. Of the 118-acre Facility Site, approximately 50 acres will be permanently fenced within a security fence and converted to industrial use for the proposed Facility. Access to the Facility will be via existing roadways. The Facility's compact footprint and its location between major infrastructure features such as I-77 and the existing rail line separate it from the majority of the residential and agricultural uses in the area. Temporary work areas will be restored following completion of construction.

(d) Structures to be Removed or Relocated

Three residences and associated structures along Seneca Lane and Puritan Street will be demolished to accommodate the proposed Facility. In addition to the above-ground structures identified in Table 08-11, there is an existing 8-inch natural gas line owned by Aspire Energy that would be relocated prior to construction to accommodate the Facility footprint. Aspire Energy would manage the permitting and approval process prior to relocating the line.

(2) Wind Turbine Structure Locations

Since the proposed Facility does not include the installation of any wind turbine equipment, this section is not applicable.

(3) Land Use Plans

(a) Formally Adopted Plans for Future Use

No formal zoning or township land use plans are available for the Facility Site. The Facility Site is located in Valley Township, along the Valley-Jackson Township boundary, which closely aligns with Seneca Lane. The townships and Guernsey County are supported

by numerous economic improvement and development organizations including the Guernsey County Community Development Corporation and the Cambridge-Guernsey County Community Improvement Corporation.

The Guernsey County Planning Commission, with guidance and consultation with The Ohio State University Extension Office, prepared the Guernsey County Comprehensive Strategic Plan (the Strategic Plan) to address development and conservation of the county's land resources.[10] The Facility is consistent with some of the key issues and goals of the Economic Development section in the Strategic Plan. The goals include maintenance of a favorable business climate, establishment of development sites, and maintenance of a diversified business and industrial base, which require allocating land for this use. The Strategic Plan specifically notes in the Population Characteristics section that "increased energy activity" and "an expanding industrial base" are actions that could reverse declining population trends. The economic benefit of increased jobs associated with the Facility also aligns well with the Strategic Plan's goals.

(b) Applicant Plans for Concurrent or Secondary Use of the Site

There are no planned concurrent or secondary commercial uses of the Facility Site other than for the proposed Facility and its associated infrastructure.

(c) Impact to Regional Development

The Facility will have a sizeable positive impact on regional development because it will contribute to investment into the local economy without the need for government

[10] Guernsey County Planning Commission (2015). Guernsey County Comprehensive Strategic Plan. Retrieved from http://energizeohio.osu.edu/sites/energizeohio/files/d6/files/imce/plancommcoplan2015.pdf.

investment. The Facility will benefit the Rolling Hills Local School District as well as the greater community in Valley Township, Guernsey County and the Eastern Ohio region.

Construction of the Facility will employ workers both directly and indirectly in Guernsey County, with annual labor enhancement of $ 611 million for the 33-month construction period (Appendix E).

Regional human and material resources are abundant and mobile; no scarcities in labor or materials and equipment are anticipated to be likely. The requirement for non-regional resources, with the exception of major equipment, is expected to be negligible. Additional housing and other services, such as education, public health, and public safety, are very unlikely to be required because the labor force for the Facility is locally available.

Transportation facilities will not require expansion as a result of the Facility because the impacts of construction will be temporary. Commuting by the approximately 25 operating personnel is not expected to have a significant impact on local roads.

(d) Compatibility with Current Regional Plans

Although neither Valley Township nor the Village of Byesville have specific zoning designations for intended land use, the Facility is consistent with regional economic development planning in the Strategic Plan, as noted above.

(e) Demographic Characteristics

Areas within a 5-mile radius of the Project Area include: Cambridge; Byesville; Lore City; Pleasant City; Senacaville; and Buffalo in Guernsey County. Unincorporated portions of Noble and Guernsey Counties are also included. The 2016 and 2026 population

estimates were projected based on the average annual growth rate derived from U.S. Census Bureau's American Community Survey 2010-2015 data.[11]

Table 08-12 presents the population data for each city and/or township within 5 miles of the Facility Site. Byesville, Pleasant City, Senacaville, and Buffalo are located entirely within 5 miles of the Project Area. Portions of the other surrounding communities of Cambridge (19.4%), Lore City (72.5%), unincorporated Noble County (17.8%), and unincorporated Guernsey County (78%) are also located within 5 miles of the Project Area. Table 08-12 presents the current and projected populations that live within 5 miles of the Facility Site, assuming equal distribution of individuals across the geographic space.

TABLE 08-12
EXISTING AND PROJECTED POPULATIONS

City/Village/Census Designated Area	Percent of Community within 5 Miles of Facility Site	2016 Estimated Population[a]	2016 Estimated Population within 5 Miles of Facility Site	2026 Projected Population[b]	2026 Projected Population within 5 miles of Facility Site
Cambridge	19.4	10,449	2,027	9,840	1,909
Byesville	100.0	2,243	2,243	2,191	2,191
Lore City	72.5	298	216	275	199
Pleasant City	100.0	419	419	372	372
Senacaville	100.0	278	278	199	199
Buffalo	100.0	459	459	829	829

[11] United States Census Bureau American Fact Finder, https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml.

City/Village/Census Designated Area	Percent of Community within 5 Miles of Facility Site	2016 Estimated Population[a]	2016 Estimated Population within 5 Miles of Facility Site	2026 Projected Population[b]	2026 Projected Population within 5 miles of Facility Site
Unincorporated Noble County[c]	17.8	11,949	2127	11,797	2100
Unincorporated Guernsey County[d]	78.0	23,787	17,840	23,620	18,424

[a] Population assumes equal distribution of individuals across geographic area. Projection based on annual average growth rate derived from 2010-2015 population estimates.
[b] Population assumes equal distribution of individuals across geographic area. Projection based on annual average growth rate derived from 2010-2015 population estimates.
[c] Population estimate derived by subtracting the population estimates of population places from county population estimate (i.e., the Noble County population minus the population of Batesville, Belle Valley, Caldwell, Dexter City, Sarahsville, and Summerfield).
[d] Population estimate derived by subtracting the population estimates of population places from county population estimate (i.e., the Guernsey County population minus the population of Buffalo, Byesville, Cambridge, Cumberland, Fairview, Kimbolton, Lore City, Old Washington, Pleasant City, Quaker City, Salesville, and Senacaville).

(D) CULTURAL AND ARCHAEOLOGICAL RESOURCES

Phase I archaeological surveys and architectural surveys were conducted in early 2017; when reports are available, they will be provided to the Ohio Historic Preservation Office (OHPO) for review.

(1) Cultural Resource Mapping

The mapping provided in Figures 08-11A through 08-11H depicts formally adopted recreation areas and registered landmarks of historic, religious, archaeological, scenic, natural or other cultural significance within a 5-mile radius of the Facility Site.

(2) Cultural Resource Impacts

A Phase I archaeological investigation has been conducted for the entire Project Area; formal results are still pending, and will be submitted to the OHPO upon completion. The majority of the Project Area did not contain archaeological material or included small scatters that are not considered to be significant. Several areas of finds that would warrant additional investigation if impacted were noted; only one of these overlaps with the southern portion of the Facility footprint, and is just north of the existing REX natural gas pipeline ROW. The areas that will be avoided are not planned for additional study. Within the area that overlaps with the Facility footprint, a total of 52 prehistoric artifacts were recovered from 21 positive shovel test pits. A Phase II investigation within this approximately 2.5-acre area will be undertaken to determine whether the site contains significant information that would make it eligible for National Register of Historic Places (NRHP)-listing.

Cultural resource investigations began with a literature review for property within the Project Area. A limited number of the features identified are potentially within the viewshed of the Facility. These include: a small portion of one of the three identified Ohio Genealogical Society-listed cemeteries, located northeast of the Facility; and one historic structure and four archaeological sites (which are currently open fields in agricultural use) northwest of the Facility Site. Views from these areas are anticipated to be limited by existing vegetation and topography.

Two National Register of Historic Places buildings (the Ebenezer Finley House and the Bethel Methodist Episcopal Church) occur within 5 miles of the Project Area. No visual impacts are anticipated to result from the Facility due to distance, vegetation, and topography, although the tops of the stacks could be visible (as are the existing electric transmission towers).

In conducting the historic structures survey, it was noted that many of the structures mapped on a 1961 USGS map are no longer extant, and that older homes within the 1-mile preliminary Area of Potential Effect (APE) that would be most sensitive for potential viewshed impacts were generally lacking historic integrity. The historic structures survey identified 70 historical architectural resources within a 1-mile radius of the Facility, 67 of which were located within the 1-mile indirect APE, and three located within the direct APE. Although located within the Facility Site boundary, the three resources located within the direct APE (two residences and one railroad bridge), will be avoided by Facility construction.

In all, seven resources— six farmsteads and one railroad bridge— were recommended for additional study in order to assess NRHP-eligibility. When the historic structures report is available it will be provided to OHPO for review. It is not anticipated that the proposed Facility will result in any direct or indirect impacts to historic resources.

(3) Recreational Areas

Six recreational areas exist within a 5-mile radius of the Facility Site. Jackson Park, located approximately 1.25 miles north of the Facility Site, is a local park which includes a playground, pond, and walking paths. Another local parked named State Park, located approximately 2 miles north of the Facility Site, includes playing fields and a basketball court. Approximately 2 miles west of the Facility Site is the Indian Lakes Recreation Area Upper Lake and Lower Lake, which support recreational fishing activities. The Cambridge County Club, which includes a private 18-hole golf course and other recreational facilities on a 150-acre property, is located approximately 2.4 miles northwest of the Facility Site. The 76-acre Dan and Margaret James Wildlife Area is located approximately 2.6 miles northeast of the Facility Site,

and provides opportunities for hunting, trapping and bird watching. Robins Ridge Golf Course, an 18-hole public course, is located approximately 5 miles east of the Facility Site.

None of these recreation areas are in immediate proximity to the Facility Site, and no impact to land or water recreation is anticipated to result from construction or operation of the Facility.

(4) Visual Impacts

(a) Project Visibility

A viewshed analysis was conducted to identify areas within a 5-mile radius of the Facility Site from which the Facility could potentially be visible, assuming the proposed height of the HRSG stacks (180 feet). Mapped cultural and recreation resources within a 5-mile radius are presented in Figures 08-11A through 08-11H. Visibility in this area is anticipated to be largely shielded by the surrounding topography and vegetation.

(b) Existing Landscape

The existing landscape within a 5-mile radius of the Facility Site is rural in character, comprised predominantly of land within unincorporated Guernsey County. Populated places with relatively higher density neighborhoods, including Byesville, Pleasant City, Senacaville, Buffalo, and portions of Cambridge and Lore City, are also located within the 5-mile radius. Outside of the populated places, the 5-mile radius is comprised of relatively low-density, scattered residences and smaller neighborhoods.

I-77 (to the east) and I-70 (to the north) are the major 4-lane transportation corridors within 5 miles of the Facility Site. Other transportation corridors include two-lane county and local roads. A small portion of the John Hunt Morgan Heritage Trail, a 557-mile trail

for a self-guided driving tour of the Morgan Raid during the American Civil War, is located within 5 miles of the Facility Site.

The Facility Site itself is generally flat, ranging in elevation from approximately 800 to 830 feet amsl. The Facility Site is surrounded by areas of higher elevation and undulating topography, east of Marietta Road and west of I-77 and Vocational Road. The elevation reaches approximately 900 feet amsl west of the Site and Marietta Road, and ranges from approximately 860 feet to 930 feet amsl just east of I-77.

To the north of the Facility Site, terrain is generally level until elevations begin to rise to approximately 850 feet approximately one mile to the north-northwest. The elevation changes more frequently in the hilly area northeast of the Facility Site, beyond Marietta Road. Similarly, elevations are generally flat to the south beyond Clay Pike Road; however, continuing south of Clay Pike Road, the elevation changes south and west of Pleasant Road. The areas of relatively limited and lower elevation change are defined by the presence of meandering creeks and brooks, including Wills Creek, which runs west of the Facility Site and wraps around the southern boundary of the Facility Site.

Limited vegetation exists on the Facility Site, as the Facility Site is currently developed and cleared for agricultural use. An AEP electric transmission line runs generally east-west across the Facility Site, south of the area in agricultural use; this provides an existing visual element. Two existing AEP transmission towers are located at the southern end of the Facility Site, approximately 140 and 110 feet tall.

Three residences and associated structures are located in the northern portion of the Facility Site that will be demolished prior to the start of construction. The Facility Site and

the Laydown and Parking Area surround, but do not include, two residences that will remain in use following construction and operation of the Facility.

(c) Landscape Alterations

As the Facility Site and Laydown and Parking Area are generally open fields, minimal tree clearing will be required to accommodate the Facility. At certain locations from the surroundings, Facility components (particularly the top of the stacks and the ACCs) may be visible. However, for the majority of the area within 5 miles of the Facility Site, the Facility will be generally well-buffered and hidden from view in most directions due to distance and/or the presence of intervening topography, vegetation, and existing structures.

The viewshed analysis, as described below, suggests the potential viewers will predominantly be local residents in the immediate vicinity and travelers using local roadways and the adjacent I-77.

(d) Visual Impacts

A viewshed analysis was conducted to consider key aesthetic resources located within a 5-mile radius of the Facility Site. The viewshed analysis considered visually sensitive resources, as well as existing terrain and vegetation that naturally prevents views of the Facility.

(e) Photographic Simulations

Figure 03-4 presents a rendering of the Facility. Figures 08-12A and 08-12B provide photographic simulations developed to provide a representation of what the Facility will look within the existing landscape. These two locations were selected to

represent potentially sensitive viewing locations from the eastern and western sides of the Facility Site.

Figure 08-12A depicts potential views from Vocational Road, a two-lane road that runs generally in the north-south direction, east of the Facility Site. The photo location is approximately 0.65 miles from the southeastern corner of the Facility Site, near the intersection of Vocational Road and the Guernsey-Noble Vocational School's driveway entrance. This view represents the potential visual experience of students at the vocational school, and through travelers driving along Vocational Road.

Figure 08-12B depicts potential views from Marietta Road, a two-lane road that runs generally in the north-south direction, west of the Facility Site. The photo location is approximately 0.6 miles from the southwestern corner of the Facility Site, near a residence located along the road. This view represents the potential visual experience of the homeowners and tenants, as well as through travelers driving along Marietta Road.

Several other locations, including the potential views from local cemeteries, churches, schools, and other sensitive receptors in the area, were considered and assessed. The assessment indicated no significant visual impacts would occur from these areas due to intervening vegetation and topography.

(f) Proposed Mitigation Measures

The Facility will be located on approximately 50 fenced-in acres within an approximate 118-acre parcel, with the existing narrow treelines retained to the extent possible. This careful siting, in conjunction with the natural topographic and vegetative screening in the surrounding area, will minimize the Facility's potential visual effect. Facility lighting will be designed to reduce impact to the extent feasible, with downward

facing fixtures and appropriate fixture placement, while still meeting safety and security needs. Paint colors will be muted, consistent with industrial-type facilities, and will be selected to minimize adverse visual impacts to the surrounding area to the extent feasible.

(E) AGRICULTURAL DISTRICTS

(1) Agricultural Land Mapping

Figure 08-13 illustrates agricultural land located within the boundaries of the proposed Facility Site and Laydown and Parking Area based on a review of aerial photography. No agricultural districts are located within the Project Area. The Ohio Department of Agriculture (ODA) Office of Farmland Preservation, indicates no ODA Agricultural Easements nor Agricultural Security Areas are located within Guernsey County. The ODA estimates approximately 164,095 acres (or 49% of the county's approximate land area) was in agricultural use in 2014.[12]

(2) Potential Impact to Agricultural Land

(a) Acreage Impacted

No agricultural impacts to field operations, irrigation, or field drainage systems associated with agricultural district lands will occur as a result of construction, operation, or maintenance of the proposed Facility, as no agricultural districts are identified within the Facility Site or Laydown and Parking Area. Approximately 71 acres and 15 acres are currently in agricultural use on the Facility Site and Laydown and Parking Area, respectively.

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[12]ODA Office of Farmland Preservation (2015). 2014 Annual Report. Retrieved from http://www.agri.ohio.gov/farmland/docs/2014%20Farmland%20Annual%20Report.pdf.

(b) Impact of Project Activities

No impact will occur as a result of construction, operation, or maintenance of the proposed Facility on agricultural district lands, as no such lands were identified within the Facility Site or Laydown and Parking Area. However, construction will occur on land currently in agricultural use. It is not anticipated that agricultural use on the Facility Site will be restored to these lands upon completion of construction as the Facility will be fenced for security purposes.

(c) Agricultural Mitigation Practices

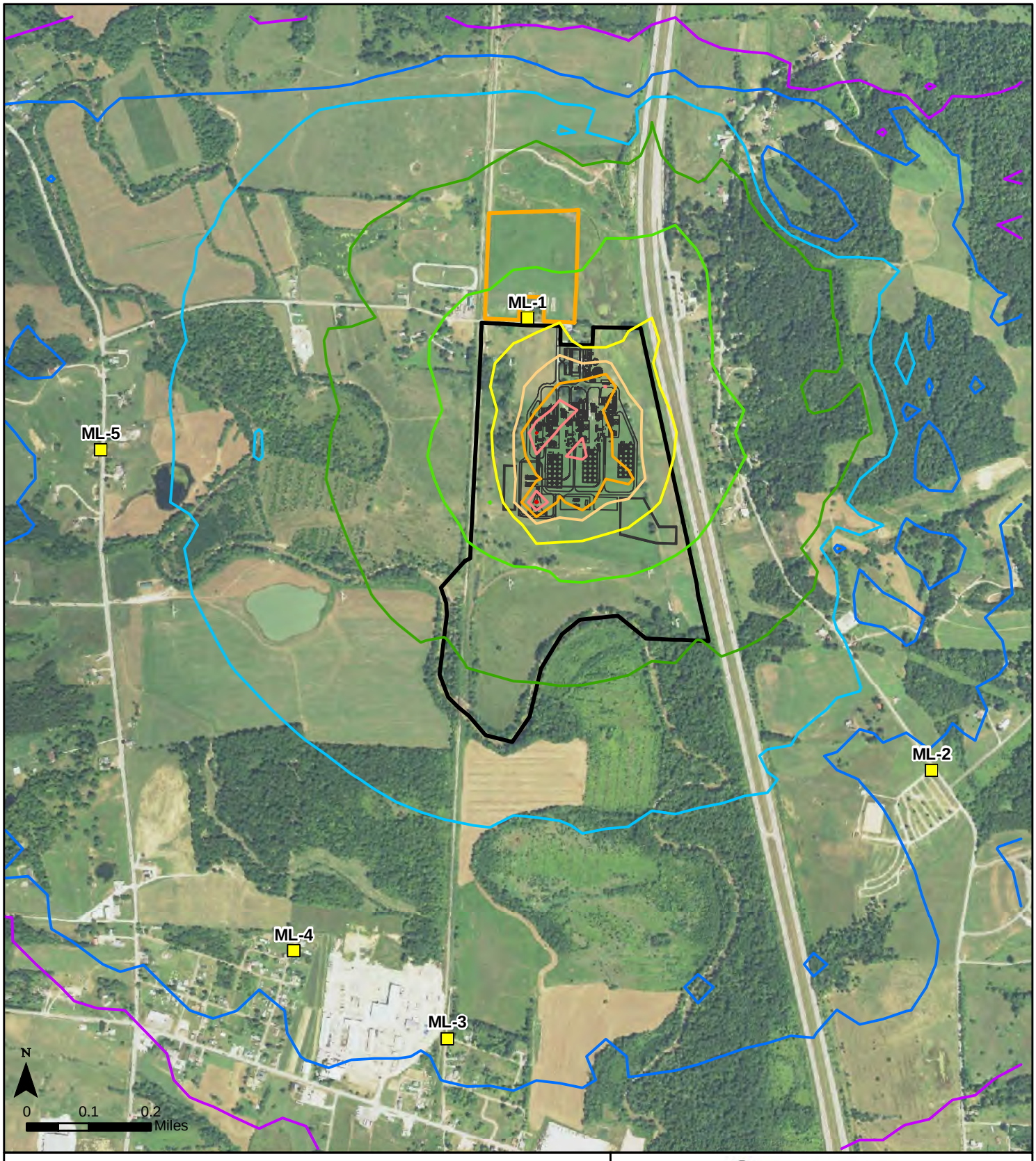
Agricultural mitigation procedures will not be implemented, as the land within the fenceline of the Facility Site will no longer be in agricultural use. Areas beyond the fenceline but still within the Facility Site not used for industrial purposes will be allowed to revegetate to the extent that the site will remain secure and accessible for maintenance purposes. The Laydown and Parking Area will be restored to its previous condition upon completion of construction. If drainage tile systems utilized by adjoining parcels are affected, the tiles will either be relocated or restored.

(F) OTHER CONSIDERATIONS IN PREPARING THE APPLICATION

No other considerations have been identified.

Section 4906-4-08: Figures

- **Figure 08-1: Sound Level Contours**
- **Figure 08-2: Baseline Sound Monitoring Locations**
- **Figure 08-3: Water Wells, Oil and Gas Wells and Drinking Water Source Protection Areas (USGS)**
- **Figures: 08-4: Groundwater Resources - Existing Aquifers**
- **Figure: 08-5: FEMA Flood Zones**
- **Figure 08-6: Soils**
- **Figure 08-7 Natural Resource Characteristics of the Site and Surroundings**
- **Figures 08-8A, 8B, and 8C: Wetland Details**
- **Figure 08-9: Proposed Natural Resource Impacts**
- **Figure 08-10A: Surrounding Land Use within One Mile**
- **Figure 08-10B: Surrounding Land Use - Structures**
- **Figure 08-11A through H: Cultural and Recreational Areas within Five Miles**
- **Figure 08-12A: Photographic Simulation – Vocational Road**
- **Figure 08-12B: Photographic Simulation – Marietta Road**
- **Figure 08-13: Agricultural Land**



Legend

- Short-term Baseline Sound Monitoring Locations
- Facility Site
- Proposed Laydown/Parking

Sound Level Contours (dBA):

30	55
35	60
40	65
45	70
50	75

Guernsey Power Station

Figure 08-1
Guernsey Power Station

Sound Level Contours

Guernsey County, Ohio

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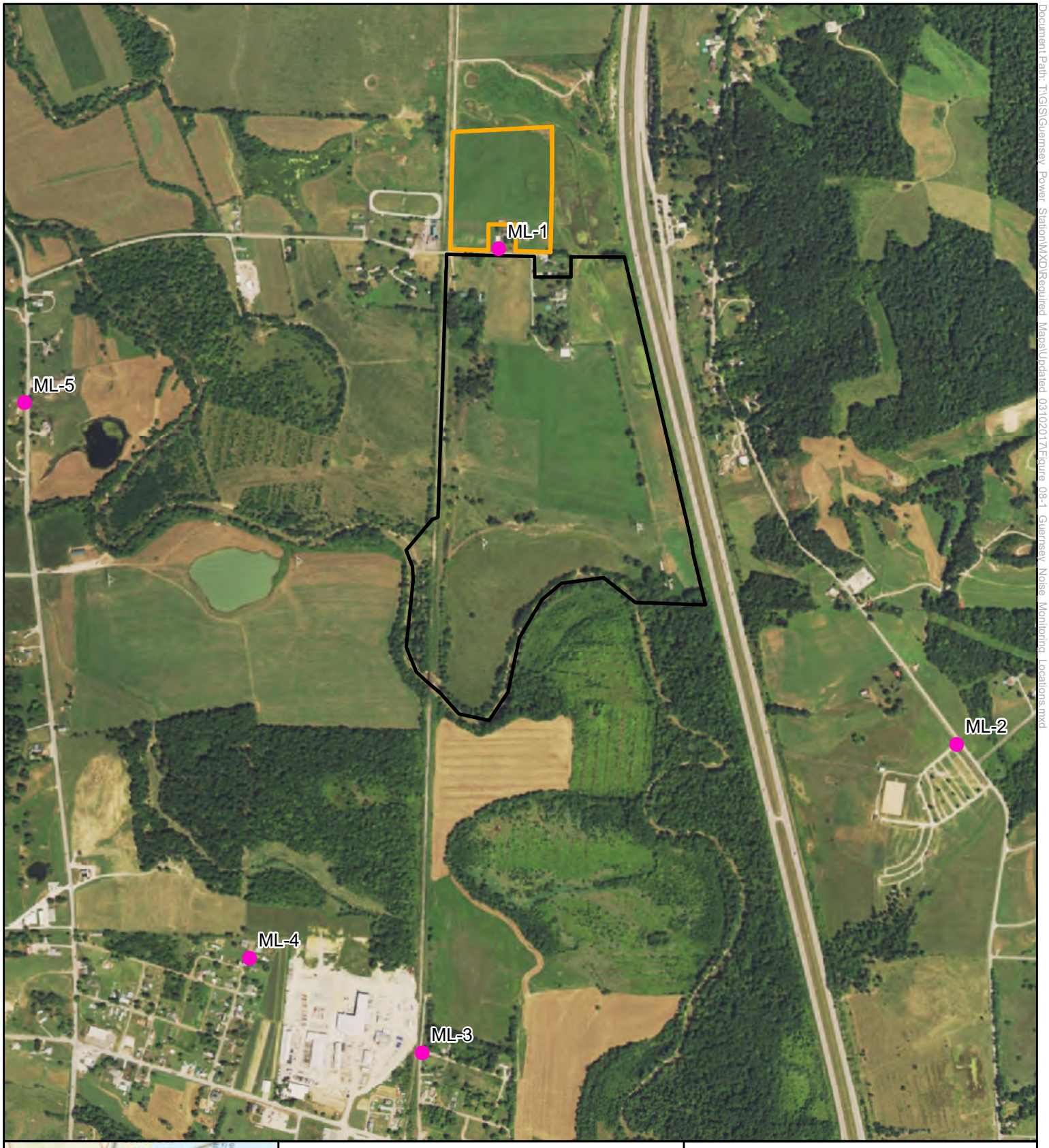


Legend

- Facility Site
- Proposed Laydown/Parking
- Short-Term Baselline Sound Monitoring Locations

0 500 1,000 Feet

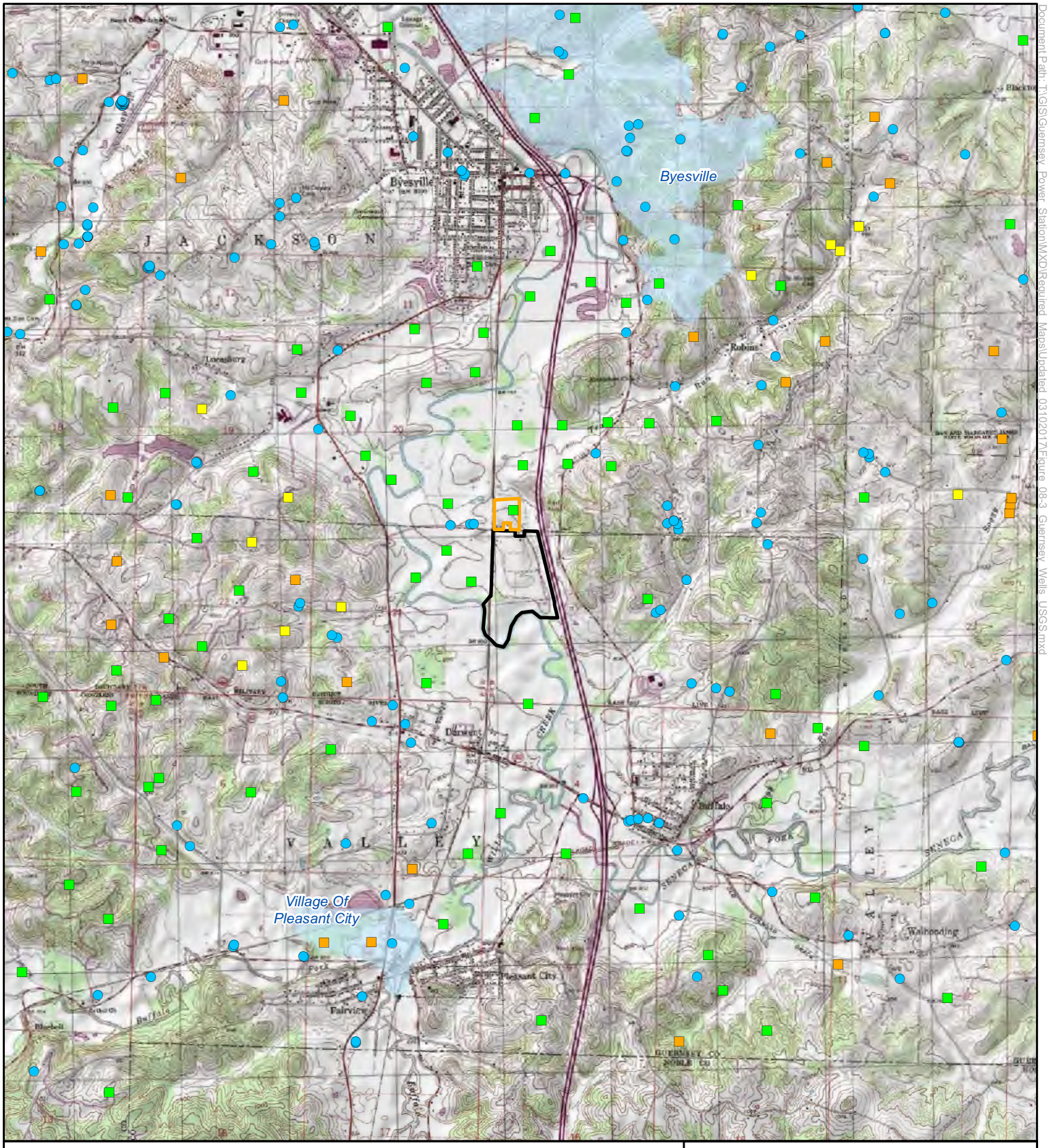
Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Guernsey Power Station

Figure 08-2
Guernsey Power Station

Baseline Sound Monitoring Locations

Guernsey County, Ohio



Legend

- Facility Site
- Proposed Laydown/Parking
- Gas Well
- Oil Well
- Oil and Gas Well
- Water Well
- Drinking Water Source Protection Area

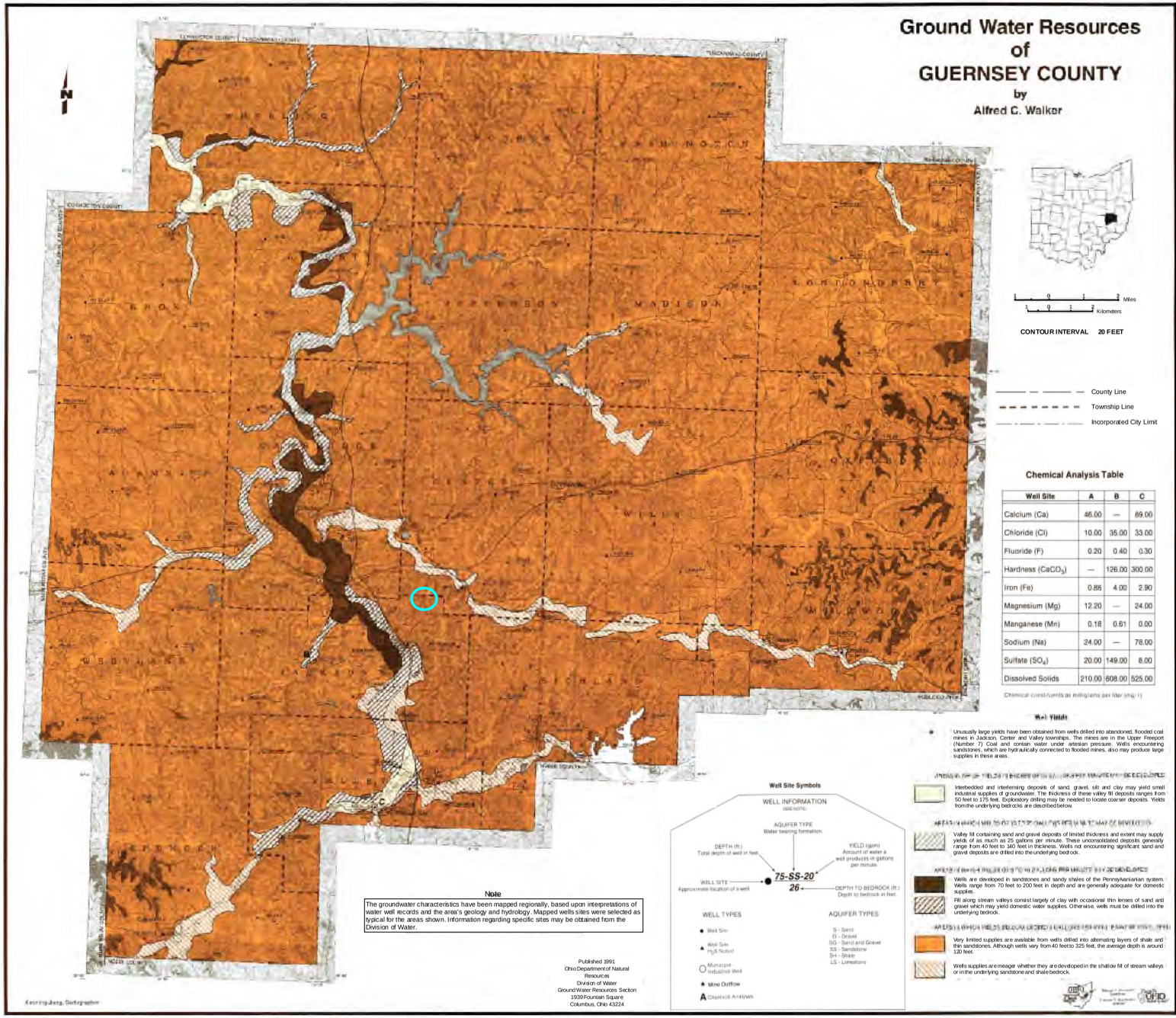
Sources: Oil/Gas Wells - Ohio DNR-DOGRM, Water Wells - Ohio DNR-DSW, Drinking Water Source Protection Area - Ohio EPA

0 2,000 4,000 Feet

Guernsey Power Station

Figure 08-3
Guernsey Power Station
Water Wells, Oil and Gas Wells
and Drinking Water
Source Protection Areas (USGS)

Guernsey County, Ohio



Legend

General Project Area

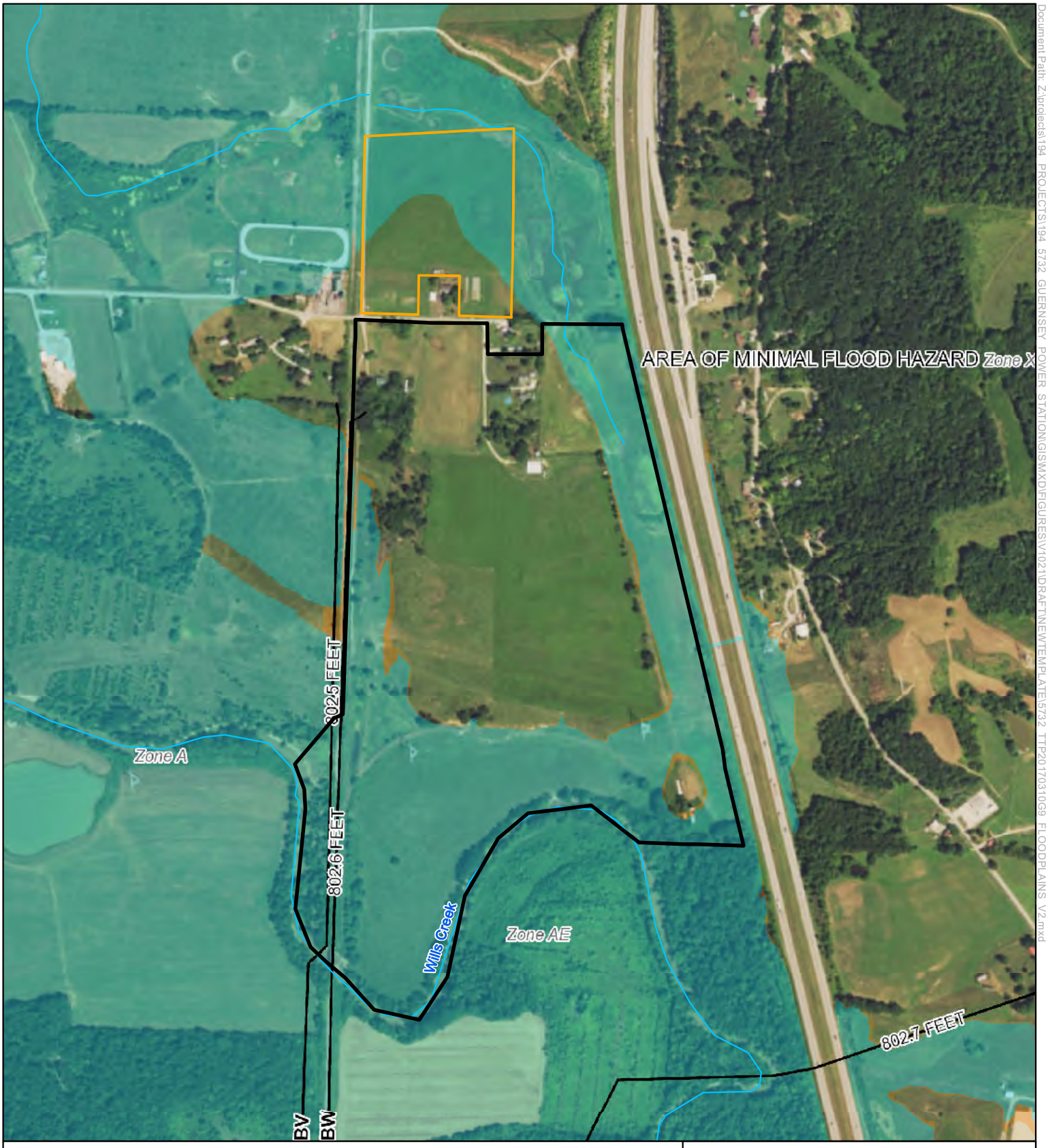
Guernsey Power Station

Figure 08-4
Guernsey Power Station

Groundwater Resources - Existing Aquifers

Guernsey County, Ohio

Source: Ohio Department of Natural Resources Division of Water Groundwater Resources Maps



Legend

- Facility Site
- Proposed Laydown/Parking
- 100-year Floodplain
- Stream/River
- Cross-Sections

Zone A: Areas with 1% chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. Because detailed analyses are not performed for such areas; no depths or base flood elevations are shown within these zones.
Zone AE: The base floodplain where base flood elevations are provided. AE Zones are now used on new format FIRMs instead of A1-A30 Zones.
Zone X: Area of minimal flood hazard, usually depicted on FIRMs as above the 500-year flood level.

0 500 1,000 Feet

Source: FEMA National Flood Hazard Layer 2016

TETRA TECH

Figure 08-05
Guernsey Power Station

FEMA Flood Zones

Guernsey County, Ohio

Legend

- Facility Site
- Proposed Laydown/Parking
- Soil Unit Boundary
- Stream/River

GdD: Gilpin loam, 5-25% slopes
GnA: Glenford silt loam, 0-3% slopes
LwE: Lowell-Westmoreland silt loams, 25-35% slopes
McA; McGary silt loam, 0-3% slopes
MeB: Mentor silt loam, 2-8% slopes
MeC: Mentor silt loam, 8-15% slopes
MeD: Mentor silt loam, 15-25% slopes
No: Nolini silt loam, 0-3% slopes, frequently flooded
Sa: Sarahsville silty clay loam, frequently flooded
W: Water
Zs: Zipp silty clay loam, ponded

0 500 1,000 Feet

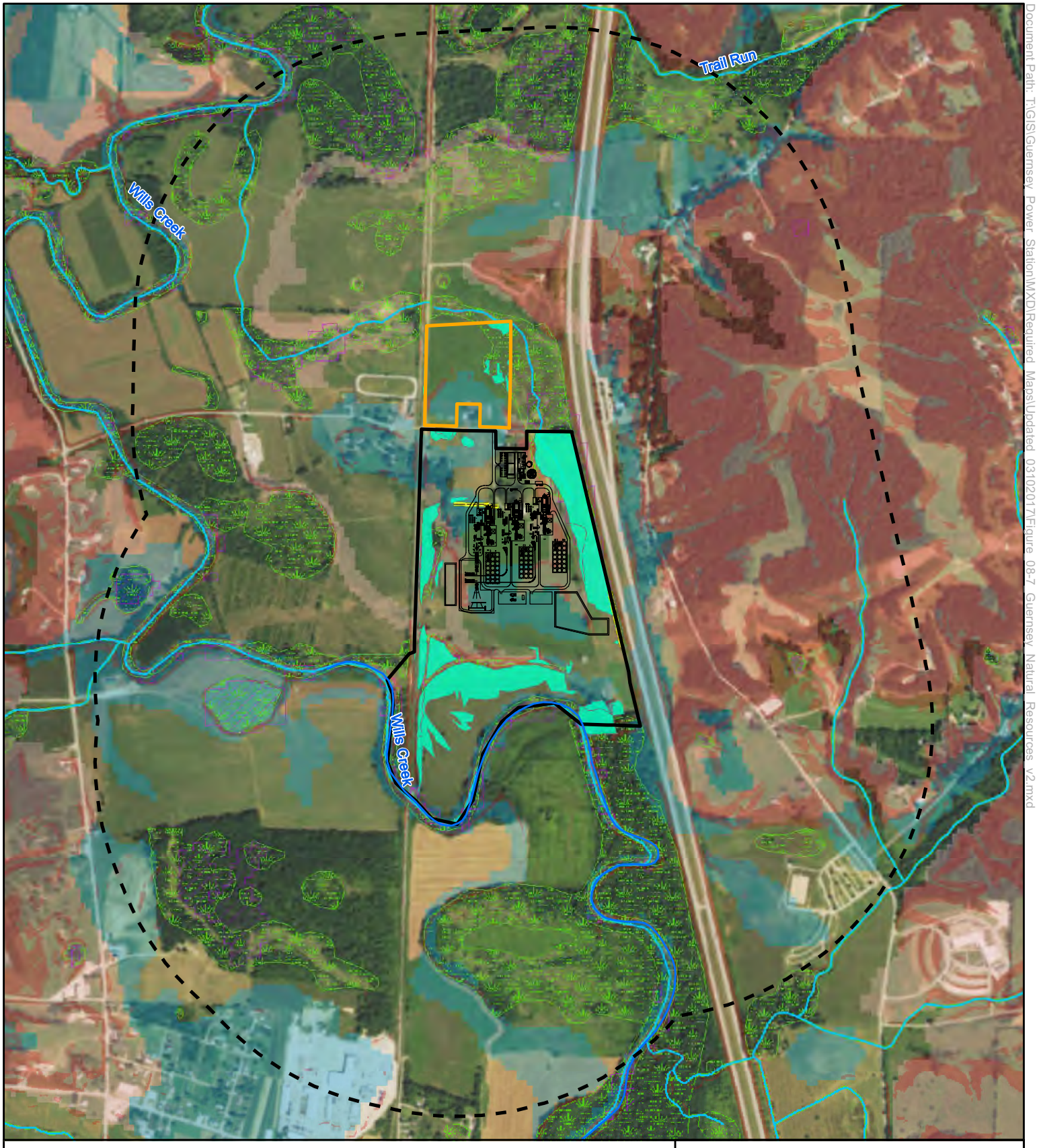
Sources: Soils - USDA - NRCS 2016, Streams/River - NHD

TETRA TECH

Figure 08-06
Guernsey Power Station

Soils

Guernsey County, Ohio



Legend

- Proposed Property Boundary
- Proposed Laydown/Parking
- Facility Site Layout
- 0.5-Mile Radius
- Slopes >12%
- NHD Stream/River
- Field-Delineated Stream
- Field-Delineated Drainage Feature
- Field-Delineated Wetland
- OWI Wetland
- NWI Wetland
- Highly erodible land
- Potentially highly erodible land

Sources: Streams - NHD, Wetlands - OWI/NWI, Erodible Land - Ohio DNR, Slopes - Reclassified USGS 3m DEM

0 500 1,000 Feet

Guernsey Power Station

Figure 08-7
Guernsey Power Station

Natural Resource Characteristics of the Site and Surroundings

Guernsey County, Ohio

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3/16/2017 11:18:52 AM

in

Case No(s). 16-2443-EL-BGN

Summary: Application of Guernsey Power Station, LLC Part 2 - Application Text electronically filed by Teresa Orahood on behalf of Sally W. Bloomfield