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April 9, 2021

Ms. Tanowa Troupe, Secretary
Ohio Power Siting Board
Docketing Division
180 East Broad Street, 11th Floor
Columbus, Ohio 43215-3797

Re: Case No. 20-1680-EL-BGN

In the Matter of the Application of Yellow Wood Solar Energy LLC for a Certificate of Environmental Compatibility and Public Need to Construct a Solar-Powered Electric Generation Facility in Clinton County, Ohio.

Response to First Data Request from Staff of the Ohio Power Siting Board

Dear Ms. Troupe:

Attached please find Yellow Wood Solar Energy LLC's ("Applicant") Response to the First Data Request from the staff of the Ohio Power Siting Board ("OPSB Staff"). The Applicant provided this response to OPSB Staff on April 9, 2021.

We are available, at your convenience, to answer any questions you may have.

Respectfully submitted,

/s/ Christine M.T. Pirik

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(Counsel of Record)

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Cc: Andrew Conway
Theresa White
Randall Schumacher
Jonathan Pawley

Attorneys for Yellow Wood Solar Energy LLC

Ms. Tanowa Troupe
Yellow Wood Solar Energy LLC
Case No. 20-1680-EL-BGN
Page 2

CERTIFICATE OF SERVICE

The Ohio Power Siting Board's e-filing system will electronically serve notice of the filing of this document on the parties referenced in the service list of the docket card who have electronically subscribed to these cases. In addition, the undersigned certifies that a copy of the foregoing document is also being served upon the persons below this 9th day of April, 2021.

/s/ Christine M.T. Pirik

Christine M.T. Pirik (0029759)

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Administrative Law Judge:

daniel.fullin@puco.ohio.gov

4814-9981-4373 v1 [39579-47]

**BEFORE
THE OHIO POWER SITING BOARD**

In the Matter of the Application of Yellow Wood Solar)
Energy LLC for a Certificate of Environmental)
Compatibility and Public Need to Construct a Solar-) Case No: 20-1680-EL-BGN
Powered Electric Generation Facility in Clinton)
County, Ohio.)

**YELLOW WOOD SOLAR ENERGY LLC 'S
RESPONSE TO THE FIRST DATA REQUEST
FROM THE STAFF OF THE OHIO POWER SITING BOARD**

On February 24, 2021, Yellow Wood Solar Energy LLC (“Applicant” or “Yellow Wood”) filed an application (“Application”) with the Ohio Power Siting Board (“OPSB”) proposing to construct a solar-powered electric generation facility in Clinton County, Ohio.

On March 31, 2021, the Staff of the OPSB (“OPSB Staff”) provided the Applicant with OPSB Staff’s First Data Request. Now comes the Applicant providing the following response to the First Data Request from the OPSB Staff.

Project Description

1. **Page 2 of the Exhibit L (Preliminary Geotechnical Engineering Report by Terracon) indicates the “final understanding” is for a 230 MW solar facility. The Application indicates 300 MW. Please clarify the discrepancy.**

Response: The Yellow Wood solar project will be up to 300 megawatts (“MW”). Therefore, Application Exhibit L page 2 should be corrected to state “[w]e understand that the project site is being considered for development of a 300 Megawatt photovoltaic (PV) solar power facility.”

2. **Page 50/144 of Exhibit L shows a figure of the proposed facility located in southwest Warren County instead of the understood location of far south-central Clinton County. Please revise as necessary.**

Response: The Yellow Wood facility will be located in Clinton County, Ohio. Attachment 1 hereto contains the corrected figure from page 50/144 of Application Exhibit L. This figure

supersedes and replaces the figure on page 50/144 of Application Exhibit L filed on February 24, 2021.

Aviation

3. **What is the height of the tallest structure at the solar farm including project substation?**

Response: The tallest structures at the collection substation are the lightning protection structures, which are anticipated to have a height of 90 to 100 feet.

4. **In accordance with Ohio Adm. Code 4906-4-07(E)(1), please list all public use airports, helicopter pads, and landing strips within five miles of the project area and all known private use airports, helicopter pads, and landing strips or property within or adjacent to the project area, and show these facilities on a map(s) of at least 1:24,000 scale.**

Response: There are 2 private airports (Barnett Airpark and Mackie's) and 1 private heliport (Bell Air Ranch) within 5 miles of the Project Area. Please see Attachment 2 that includes a table showing the applicable facility information.

5. **In accordance with Ohio Adm. Code 4906-4-07(E)(1), please provide confirmation that the owners of these airports have been notified by Yellow Wood Solar Energy, LLC of the proposed facility and any impacts it will have on airport operations.**

Response: The Applicant is in the process of engaging with these private facilities regarding the Project and will also notify these private facilities at least 60 days prior to construction commencement. Attachment 3 to this response includes a map reflecting the location of these private facilities.

In addition, the Applicant has received 14 Determinations of No Hazard ("DNHs") from the Federal Aviation Administration ("FAA") for the below Aeronautical Study Numbers (ASN), and

Determination of No Hazard Case Numbers:

2021-AGL-1076-OE; 2021-AGL-1077-OE; 2021-AGL-1078-OE; 2021-AGL-1079-OE;
2021-AGL-1080-OE; 2021-AGL-1081-OE; 2021-AGL-1082-OE; 2021-AGL-1083-OE;
2021-AGL-1084-OE; 2021-AGL-1085-OE; 2021-AGL-1086-OE; 2021-AGL-1087-OE;
2021-AGL-1088-OE; 2021-AGL-1089-OE

The Applicant will submit the DNH letters to OPSB shortly in a separate filing.

Decommissioning

6. **Please fully explain what financial assurance mechanism Yellow Wood Solar Energy, LLC will employ, and when the funds will be available to perform decommissioning activities. Staff would recommend that the decommissioning funds be posted in the form of a performance bond where the company is the Principal, the insurance company is the Surety, and the Ohio Power Siting Board is the Obligee.**

Response: Yellow Wood Solar Energy LLC will employ a surety bond. The bond will be posted with the company as the principal, the insurance company as the surety, and OPSB as the obligee. The funds will be available prior to the commercial operation date. The surety bond will be active during the life of the Project and will be renewed on a year-by-year basis.

7. **Please explain how often the decommissioning costs will be re-evaluated?**

Response: Following the Operations Date of the facility, decommissioning costs will be re-evaluated every five years.

8. **The decommissioning plan was developed by a professional engineer. Staff would recommend that the Applicant retain an independent, registered professional engineer, licensed to practice engineering in the state of Ohio to periodically estimate the total cost of decommissioning facility, salvage value, and appropriateness of any contingency percentage. Please indicate the Applicant's understanding and commitment to provide this to Staff and indicate when this would be provided.**

Response: Yes, the Applicant understands and commits to provide this to OPSB Staff. The Decommissioning Report ("Report") prepared by Stantec Consulting Services, Inc. and included as Application Exhibit J was reviewed and stamped by a professional engineer registered to practice engineering in the state of Ohio.

The Applicant understands the importance of periodic updates to the Report in order to accurately represent expected decommissioning costs. In addition to providing the initial Report upon Application submittal, the Applicant will provide OPSB with an updated Report every five years following the Operations Date of the facility.

Wind Velocity

9. **Please explain how Yellow Wood Solar Energy, LLC will, during the detailed engineering phase, minimize any potential damage from high wind velocities by proper structural design of the project support equipment at sufficient depths based on the site-specific soil conditions to preclude any adverse influence from high wind velocities.**

Response: American Society of Civil Engineers (“ASCE”) 7-16 is the standard by which dead, live, soil, flood, earthquake, and wind loads are determined for structural design across the United States. Per ASCE 7-16 Risk Category I, design wind speeds are 100 miles per hour (“mph”) in Clinton County, Ohio. By solar industry standards, this wind velocity is covered by basic tracking system design. Adjusting the design of the solar facility would not be anticipated until 140 mph is reached.

10. **Please indicate any wind loading precautions or wind equipment ratings that will be included in the final project design.**

Response: A wind loading study from the tracker manufacturer will be included in structural design packages. High wind velocities can be mitigated by increased foundation size and changes to the racking configuration, for example, a 2-in-portrait module configuration versus a 1-in portrait module configuration.

11. **Do the trackers under consideration have a stow mode?**

Response: Yes, the trackers under consideration have a stow mode.

Emergency Action Plan

12. **Will the emergency action plan for the project referenced on page 47 of the Application be provided to OPSB Staff prior to the preconstruction conference?**

Response: Yes, the emergency response plan for the Project will be provided to OPSB Staff prior to the preconstruction conference.

13. **Please provide the current draft emergency action plan or an example emergency action plan.**

Response: Included as Attachment 4 to this response is the Emergency Response Plan for the Hardin Solar Energy Center projects, which may be used as a template for the Yellow Wood Solar Emergency Response Plan.

Water Conservation Practice

- 14. For the O&M building, would Yellow Wood Solar Energy, LLC install modern, efficient water fixtures for all water usage, and regular maintenance to keep water fixtures in proper working order?**

Response: Yes, the Applicant will install modern, efficient water fixtures in the operations and maintenance (“O&M”) building and is committed to completing the prescribed water fixture maintenance.

- 15. Page 10 of the Application seems to indicate that water won’t be required, does Yellow Wood Solar Energy, LLC anticipate cleaning of the solar panels with water. How often would these be cleaned on an annual basis?**

Response: The Applicant does not anticipate cleaning the solar panels with water. The project would achieve cleaning of the panels from rainfall and snow.

- 16. What is the approximate volume of water that would be required to clean the solar farm?**

Response: 0 gallons.

Sound

- 17. Please update Figures 5-1, 5-2, 5-3, 7-1, and 7-2 of the noise report with noise sensitive receptors differentiated between participating and non-participating receptors.**

Response: Please see Attachment 5 to this response, which is the updated and revised Application Exhibit K, the Sound Analysis conducted by Hankard Environmental, Inc., dated April 7, 2021 (“Sound Analysis”). Attachment 5 supersedes and replaces Application Exhibit K that was filed with the Application on February 24, 2021. The attached revised sound report differentiates the participating and non-participating information. For ease of review, in the attached update, the Applicant highlighted the revisions that were made to the Exhibit K that was filed with the Application on February 24, 2021.

- 18. Please provide a table with receptors, participation status, modeled sound pressure level, and receptor location.**

Response: Please see Attachment 5, the revised Sound Analysis with participating and non-participating information now differentiated within Tables B-1 and C-1. Attachment 5 supersedes and replaces Application Exhibit K that was filed with the Application on February 24, 2021.

19. **Please update table 4-3 to include L90, L50, L10 levels.**

Response: Please see Attachment 5, the revised Sound Analysis with these levels included in Table 4-3. Attachment 5 supersedes and replaces Application Exhibit K that was filed with the Application on February 24, 2021.

20. **Please provide a KMZ file with facility fence line, panel locations, inverter locations, participating and non-participating receptors, substation location, and isophone lines.**

Response: A KMZ that includes the requested information will be provided to OPSB Staff.

Geographic Information System Data

21. **Please update Figure 03-2 (Project Area Aerial Map) and other relevant facility mapping to reflect the proposed location of the short transmission line referenced on page 12 of the Application and provide associated shapefiles.**

Response: As detailed, state licensed civil engineering design and electrical engineering design for the Project has not yet occurred. The same is true for the transmission/utility-owned line break substation that the Project will connect to. Therefore, it is difficult to depict those locations with specificity this at this time. Conceptually, the Applicant knows that the line break substation will be sited under the existing transmission lines and the Applicant has had initial discussions with the Transmission Owner about siting the Project collection substation directly adjacent, perhaps not needing poles at all, and just stringing the conductors from the two adjacent/neighboring/touching substations. Attachment 6 to this response is an updated Figure 03-2. This updated figure supersedes and replaces Figure 03-2 that was filed with the Application on February 24, 2021.

22. **Please provide updated shapefiles which include the existing transmission lines.**

Response: Applicant has updated the previously provided KMZ file with a layer for the existing area transmission lines that the Project is planned to interconnect into. These KMZs will be provided to OPSB Staff.

Electric Grid

23. **Page 17 of the Application indicates that the Feasibility Study for AE2-221 was received in October 2019 and page 26 indicates July 2019. Please confirm the date of the PJM Feasibility Study for the queue ID AE2-221.**

Response: Per the Feasibility Study Report provided by PJM Interconnection, LLC (“PJM”), the date of this report is July 2019. Therefore, the sentence on page 17 of the Application Narrative should be revised to state “AE-2221 received its Feasibility Study in July 2019.”

24. **Page 26 of the Application indicates that the Clinton-Stuart 345 kV transmission line is owned by Duke Energy Ohio. Yet, page 3 of the Exhibit D System Impact Study Report for AE2-221 indicates that the project would interconnect to the Dayton Power and Light system. Please describe more completely the connection of the facility to the 345-kV transmission line.**

Response: As stated in the System Impact Study, Application Exhibit D, the facility will interconnect to the Dayton Power and Light Company system. Therefore, the sentence on on page 26 of the Application Narrative should be revised to state “[t]he transmission line is owned by AES Ohio, formerly known as Dayton Power and Light Company.”

25. **Will Yellow Wood Solar Energy, LLC enter into an Interconnection Service Agreement and Interconnection Construction Service Agreement with Duke, DP&L, or both?**

Response: The counterparties to the Project’s Interconnection Service Agreement (“ISA”) and Interconnection Construction Service Agreement (“ICSA”) will be AES Ohio, formerly the Dayton Power and Light Company, PJM, and Yellow Wood Solar Energy LLC.

Geotechnical

26. **A significant portion of the project area overlies carbonate bedrock with less than twenty feet of glacial till. These conditions are associated with the development of karst geology. Understanding, at this time, there are no documented karst features within the project**

area, what consideration has been given to the potential for karst being encountered during construction? i.e. remedial measures or other plans for mitigation.

Response: The Applicant's consultant, Terracon, found that, according to United States Geological Survey ("USGS") mapping, the site is mapped with Waynesville and Arnheim Formations, Undivided of Ordovician age. The depth of this carbonate bedrock ranging below ≤ 50 feet to > 50 feet of glacially derived insoluble sediments in a humid climate. However, based on our experience, observations made during our site visits, information gathered from our field exploration and the publicly available karst geology field verified data, karst anomalies are not anticipated to affect the proposed development. If localized karst Features are encountered during construction, measures will be developed based on observed conditions to mitigate and remediate the exposed conditions.

- 27. All soil boring data provided within Exhibit L indicate evidence on minor (> 1 foot) cave-ins. The Application indicates piles may be installed as deep as 15 feet below ground to address loose soils and frost heave potential. 5/10 of the boring logs show the cave-ins occurring at less than 15 feet below ground. Do these cave-in conditions necessitate additional engineering consideration for the piles planned to support the panel racking system? If so, please elaborate.**

Response: According to Terracon, since the piles proposed for supporting the panel racking system will be driven, soil cave-in is not considered to be a concern as pre-drilling prior to driving of the piles is not anticipated to be required based on the results of our exploration.

- 28. Borings show no contact w/bedrock down to 20 feet below ground. Exhibit L of the Application indicates no issues driving piles is expected. Thus, pre-drilling is not expected to be necessary. However, in reviewing Ohio Department of Natural Resources' (ODNR) Ohio Geology interactive map <https://ohiodnr.gov/wps/portal/gov/odnr/business-and-industry/services-to-business-industry/gis-mapping-services/ohio-geology-interactive-map> a significant portion of the proposed panel lay-out occurs over areas showing less than 10 feet of overburden material. If bedrock is encountered, which appears to be inevitable based on the ODNR information cited above, how will the engineering design be modified to adequately address these conditions?**

Response: According to Terracon, the soil borings spread across the site did not encounter bedrock to the explored depth of 20 feet. The recommendations provided in the preliminary geotechnical report, Application Exhibit L, were based on these encountered conditions. Additional borings at closer spacing of about one boring per every 25 acres of the proposed array areas will be performed as part of the design-level study of the site. These borings will

be helpful in determining areas where the bedrock may be shallower. Based on these findings, appropriate recommendations for pile design and construction will be developed if necessary.

29. **Exhibit L provides a summary of “contributory risk components” which indicates the tilled horizon doesn’t provide suitable soil conditions for project construction. It concludes with: “These soils are not considered suitable for subgrade support or re-use as fill material.” Will these high organic content soils be excavated and replaced with engineered fill? If so, how might this affect future agricultural use following project decommissioning?**

Response: Terracon recommends that any excess materials consisting of organic matter, remnant crop vegetation, and tilled soils, be stripped temporarily stockpiled and be re-spread across the site and used in landscaped areas after completion of grading operations. These soils could be reused for future agricultural use after Project decommissioning. The geotechnical recommendation is directed for the instance of use/needed subgrade support or engineered fill, the Project will still have topsoil at grade for the establishment of native plantings. This topsoil and the use of native plantings with longer root systems aid in delivering organic material to soil depths throughout the life of the project. Additionally, the Project is has committed to return the land back to its current state through decommissioning, this would include providing applicable topsoil for agricultural use at grade upon decommissioning.

30. **Page 57 of the Application indicates ground water was observed as deep as 31 feet below ground surface in the site borings. The boring logs indicate no boring went deeper than 20 feet. Please explain.**

Response: The observation regarding static groundwater on page 57 of the Application Narrative comes from the Geotechnical Engineer’s evaluation of local wells in the area, not the boring log results. The static groundwater depths in the five water wells within the Project Area varied from 12 to 30 feet.

Impacts to Public and Private Water Supply

31. **Referring to Figure A-8 in the Ecological Assessment (Exhibit S), how many water wells are within the project area?**

Response: Per this figure, there are 6 water wells within the Project Area.

32. What is the distance between the solar farm equipment and nearest water well within the project area?

Response: The table below identifies the 6 water wells within the Project Area. No wells are located within the fence line of the Project. The table identifies the approximate distance to the nearest infrastructure. An update to Figure A-8 of Application Exhibit S is attached to this response to illustrate the Project Infrastructure in relation to these wells. Attachment 7 supersedes and replaces Figure A-8 of Application Exhibit S that was filed with the Application on February 24, 2021

Well ID	Type	Distance to Fence Line (feet)	Nearest Infrastructure (Feet)	Latitude	Longitude
498596	Water	214	254 (panels)	39.25483	-83.8072
76206	Water	1118	1200 (panels)	39.2867	-83.8327
60267	Water	230	250 (access road)	39.27696	-83.8087
328189	Water	343	369 (access road)	39.26138	-83.8489
55482	Water	460	510 (panels)	39.27369	-83.8088
526511	Water	369	403 (panels)	39.28171	-83.8301

33. Please explain what possible avoidance, minimization, and/or mitigation measures Yellow Wood Solar Energy, LLC will employ during construction for water well locations in the project area.

Response: For local private well systems, these systems are typically located near residences and Project construction is not anticipated to physically damage private wells or affect well yields. Given that minimal excavation is associated with the Project and pile driving will only occur to depths of 10 to 15 feet below grade, the Applicant does not anticipate impacts to the water supply.

Additionally, during construction, as noted on page 39 of the Application Narrative), the Project will implement a Spill Prevention, Control and Countermeasure (“SPCC”) Plan to prevent the realize of hazardous materials into the environment. The SPCC Plan will ensure that contractors maintain equipment so that it does not leak oil, hydraulic fluids, petroleum fuels, greases, cutting oils, anti-freeze, or other chemicals. If leaks or spills of these or other similar materials occur, contractors will promptly clean up the spill and will promptly notify the Applicant’s site manager of the incident.

Furthermore, because solar modules do not contain hazardous materials, no impacts to runoff are expected. Applicant will coordinate desired setbacks of solar facilities with each participating private property landowner within the Project Area.

Moreover, the Applicant will coordinate desired setbacks of solar facilities with each participating private property landowner within the Project Area.

- 34. Page 55 of the Application indicates there are no Source Water Protection Areas associated with the Project Area. Upon Staff review, a portion of the project lies within the surface water corridor management zones for the Clermont and Blanchester public water systems. What special consideration has been given to the assurance that public water supply sources will not be impacted by the proposed Yellow Wood Solar construction?**

Response: The East Fork of the Little Miami Watershed is considered potential drinking water area for both the Blanchester and Clermont public water systems. However, the public water system area is a much smaller portion of the watershed. The Clermont public water system is over 16 miles to the southwest of the Project Area, therefore, there is no affect with this system. Likewise, while a portion of the Project Area overlaps with the Blanchester public water system, the Project will not affect the Blanchester water system as the Project activities are similar to or less than agriculture and the Applicant will have permanent ground stabilization and design storm-water control that will likely improve local water quality.

Moreover, as stated previously for the local private well systems, these systems are typically located near residences and Project construction is not anticipated to physically damage private wells or affect well yields. Given that minimal excavation is associated with the Project and pile driving will only occur to depths of 10 to 15 feet below grade, the Applicant does not anticipate impacts to the water supply.

Additionally, during construction, the Project will implement a SPCC Plan to prevent the realize of hazardous materials into the environment. The SPCC Plan will ensure that contractors maintain equipment so that it does not leak oil, hydraulic fluids, petroleum fuels, greases, cutting oils, anti-freeze, or other chemicals. If leaks or spills of these or other similar

materials occur, contractors will promptly clean up the spill and will promptly notify the Applicant's site manager of the incident.

Furthermore, because solar modules do not contain hazardous materials, no impacts to runoff are expected. The Applicant is committed to only using modules that are considered non-toxic pursuant to the USEPA TCLP test.

Ecological Impacts

39. **Ohio Department of Natural Resources (ODNR) Division of Wildlife states that the project lies within the range of the Upland Sandpiper and Northern Harrier. Both species utilize grasslands and pastures for nesting and/or hunting. In the Application, Cardno lists pasture land is accounting for 44.44 acres and grasslands accounting for 1.33 acres within the project boundary. Will Yellow Wood Solar Energy, LLC be avoiding these types of habitats altogether? Or will Yellow Wood be committing to avoiding these types of habitats during the species' nesting periods of April 15-July 31 for the Upland sandpiper and May 15 to August 1 for the Norther Harrier?**

Response: The fence line within the Project Area is more refined, and limits the extent of ground disturbance and infrastructure. Within the fence line, pastures encompass 22.7 acres, and grasslands encompass 0.3 acre. To avoid impacts to potential nesting birds occupying these habitats, Yellow Wood will avoid construction in this area between April 15 and August 1, or the Applicant will work with the wildlife agencies on an alternative solution.

40. **In the Application, Cardno states that approximately 16.4 acres of the project area occur within a FEMA 100-year floodplain. Has Yellow Wood Solar Energy, LLC coordinated with the local floodplain administrator on this issue?**

- a. **Will Yellow Wood Solar Energy, LLC be required to obtain a floodplain permit for the project? And if so, please explain to Staff where Yellow Wood is in the process of obtaining the permit.**

Response: While approximately 16.4 acres of the Project Area are located within the Federal Emergency Management Agency ("FEMA") 100-year floodplain, the fence line and all of the Project infrastructure contained within the fence line are located outside of the floodplain. No ground disturbing activities will take place within the floodplain, therefore, no floodplain permit is required. Figure A-8 of Application Exhibit S, which is attached to this response as

Attachment 7, has been updated to illustrate the fence line and Project infrastructure with respect to the FEMA 100-year floodplain.

While no ground disturbing activities will disturb the floodplain and no floodplain permit will not be needed, if necessary in the future, the Applicant will coordinate with the floodplain administrator.

41. **Cardno lists eleven (11) perennial streams in the project area. Yellow Wood Solar Energy, LLC states that seven (7) of these will be crossed via HDD and thus avoid impacts. Please explain why the remaining four (4) perennial streams**
- a. **will not be crossed via HDD,**

Response: Streams S106 and S204 are proposed for access road crossing, therefore, culverts will be installed at these crossing locations and horizontal directional drilling (“HDD”) at these locations will not be necessary. However, where the collection lines cross these same streams, HDD methodology will be used.

Stream S208 was mislabeled as "open cut." It is actually an HDD crossing with 0.0 acres of impact.

The proposed crossing methods for stream S004 is open cut for collection line crossing. The Applicant will consider utilizing HDD methodology for this crossing if the April 15 to June 30 avoidance timeline for in-water work cannot be adhered to.

- b. **the total impacts to perennial streams that are anticipated, and**

Response: The Applicant proposes up to 0.034 acres of temporary impacts, and up to 0.02 acres of permanent impacts to perennial streams from the installation of 2 culverts for access roads.

- c. **the anticipated impacts to listed indigenous aquatic species that ODNR references in the coordination letter for the project when ODNR recommends avoiding in-water work in perennial streams between April 15 to June 30.**

Response: As perennial streams traversing the Project Area have been historically impacted by surrounding agricultural land use, the stream quality was observed to be relatively low, providing low quality habitat for indigenous aquatic species. However, the Applicant commits to avoiding any in-water work in perennial streams between April 15 to June 30.

42. What is the total amount of tree clearing in acres for this project?

Response: The Applicant proposes up to 1.0 acres of tree clearing.

Respectfully submitted,

/s/ Christine M.T. Pirik

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Attorneys for Yellow Wood Solar Energy LLC

Attachment 1

Updated Figure page 50 of 144
Application Exhibit L
Geotechnical Engineering Report
Terracon

This figure supersedes and replaces the figure on page 55
of 144 of Application Exhibit L filed on February 24,
2021.

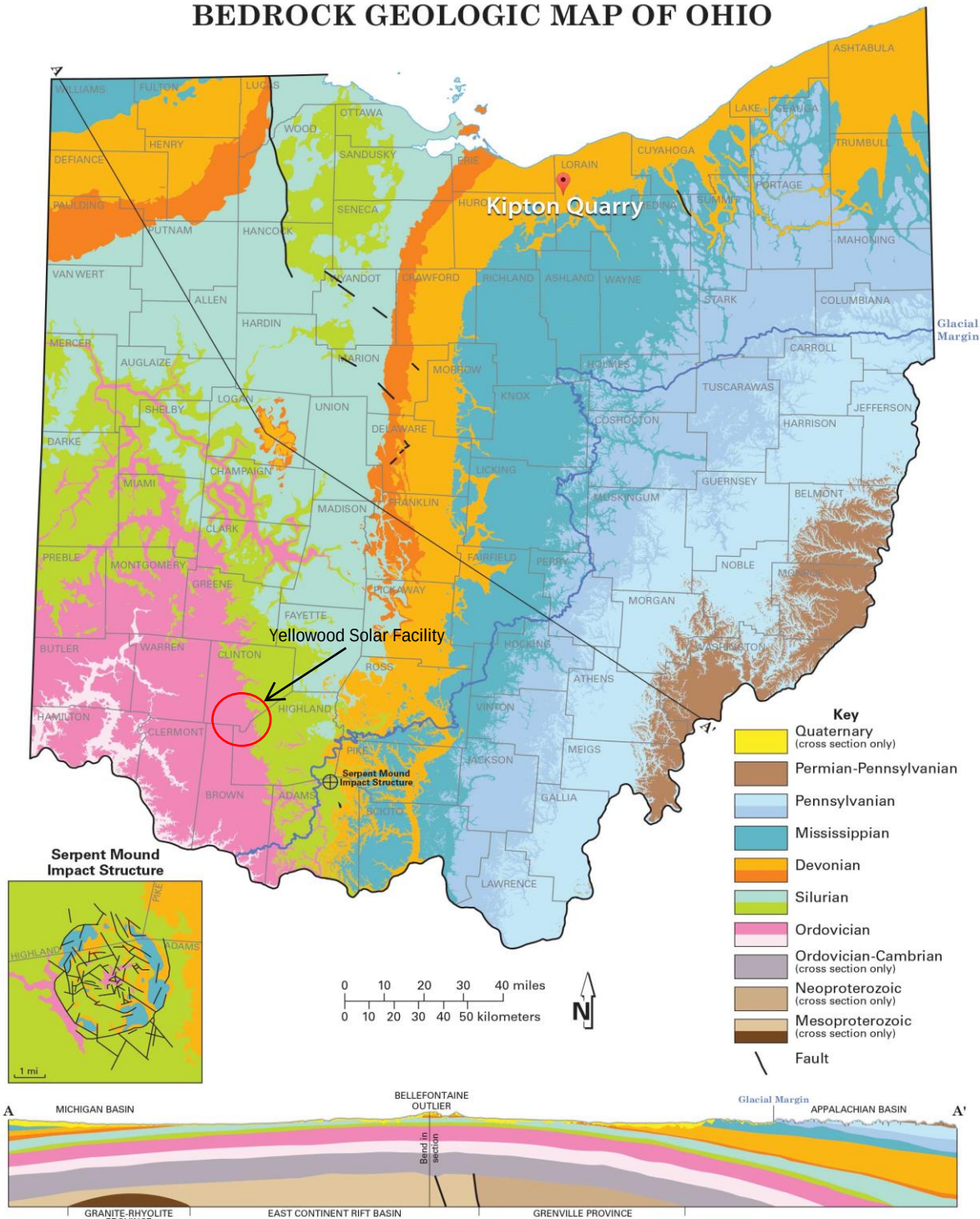
BEDROCK GEOLOGICAL MAP OF OHIO

Yellowwood Solar Facility ■ Clinton County, Ohio

August 20, 2020 ■ Terracon Project No. N4205103

STATE OF OHIO • DEPARTMENT OF NATURAL RESOURCES • DIVISION OF GEOLOGICAL SURVEY

BEDROCK GEOLOGIC MAP OF OHIO



Recommended citation: Ohio Division of Geological Survey, 2006, Bedrock geologic map of Ohio: Ohio Department of Natural Resources, Division of Geological Survey Map BG-1, generalized page-size version with text, 2 p., scale 1:2,000,000.

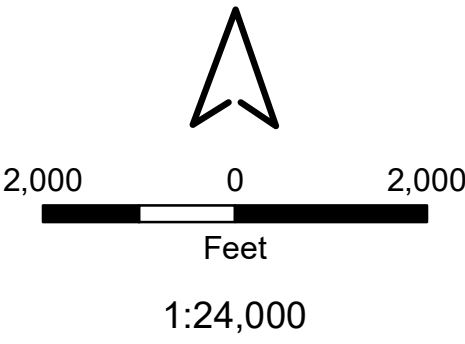
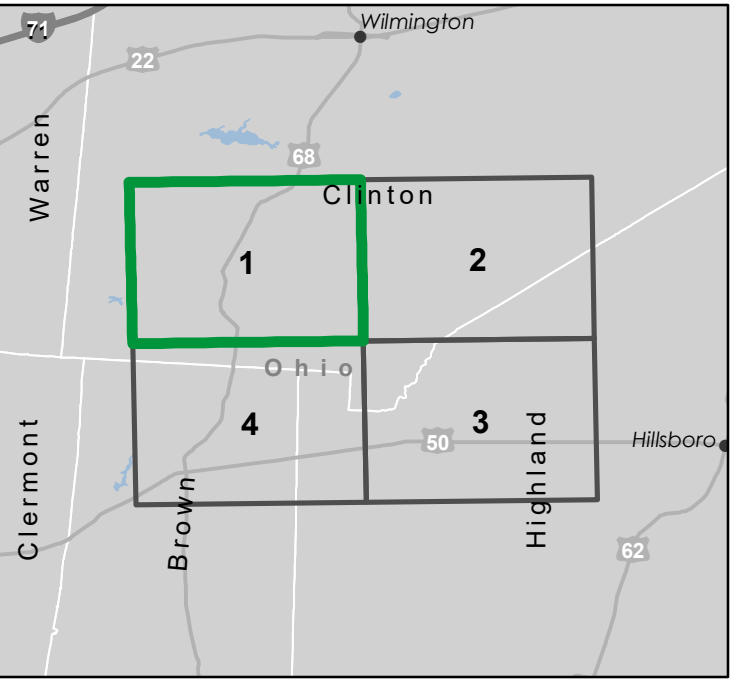
Attachment 2

List Airports

Landing Facility T	FAA Location Ider	Effective Date	FAA Region	District Office	State of City Serv	StateName	County	CountyState	City Served	Landing Facility N	Ownership	Use	Distance from Facilities
AIRPORT	1OA3	10/12/2017	AGL	DET	OH	OHIO	CLINTON	OH	BLANCHESTER	BARNETT AIRPAR	Private	PR	17,301 feet
HELIPORT	OH41	10/12/2017	AGL	DET	OH	OHIO	HIGHLAND	OH	HILLSBORO	BELL AIR RANCH	Private	PR	25,693 feet
AIRPORT	2OA2	10/12/2017	AGL	DET	OH	OHIO	BROWN	OH	MIDLAND	MACKIE'S	Private	PR	15,559 feet

Attachment 3

Map Airports



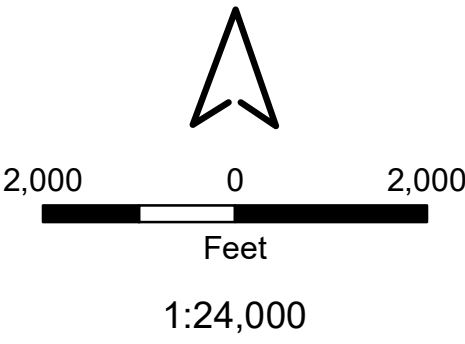
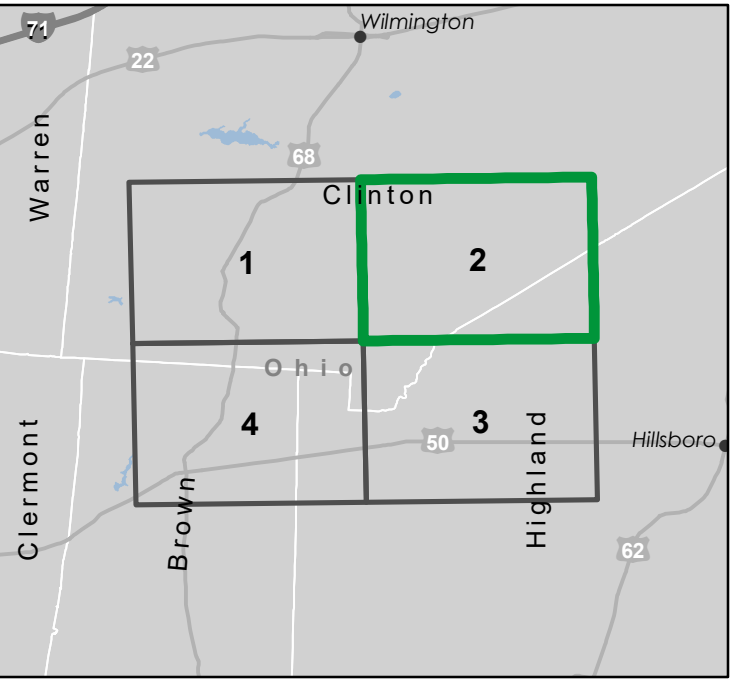
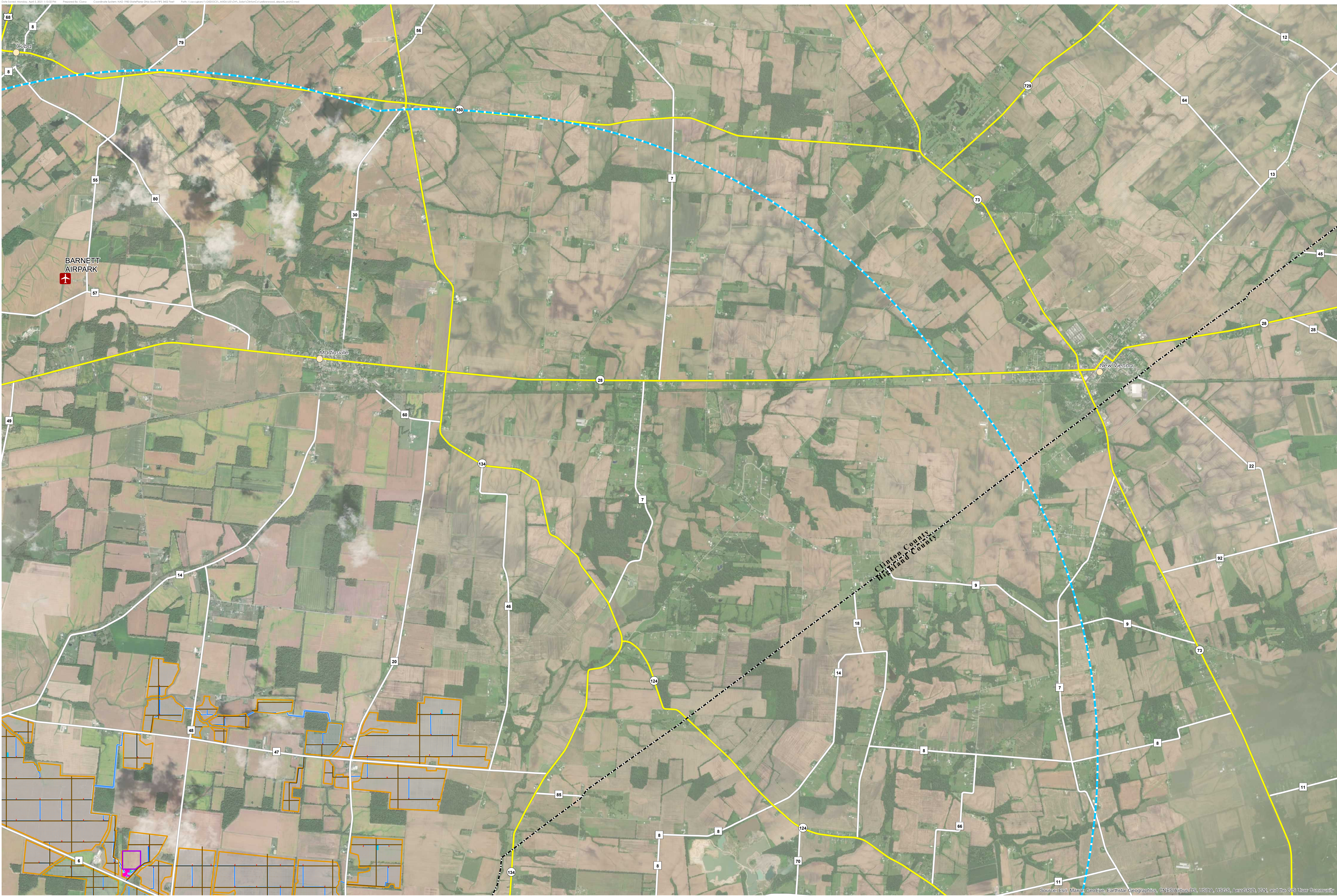
- Legend**
- City
 - NFDC Facility**
 - Airport
 - Helipoint
 - Road Classification**
 - US/State Route
 - County Road
 - County Boundary
 - Yellow Wood 5 mile Buffer
 - Project Layout**
 - Collection
 - Solar Array
 - Substation
 - Fence Line
 - Inverters
 - Access Road
 - O&M Building
 - Switchyard
 - Met Station

Airport Summary: Map 1

Yellow Wood Solar Energy Center | Clinton County, Ohio

Rev. 00
April 05, 2021





Legend

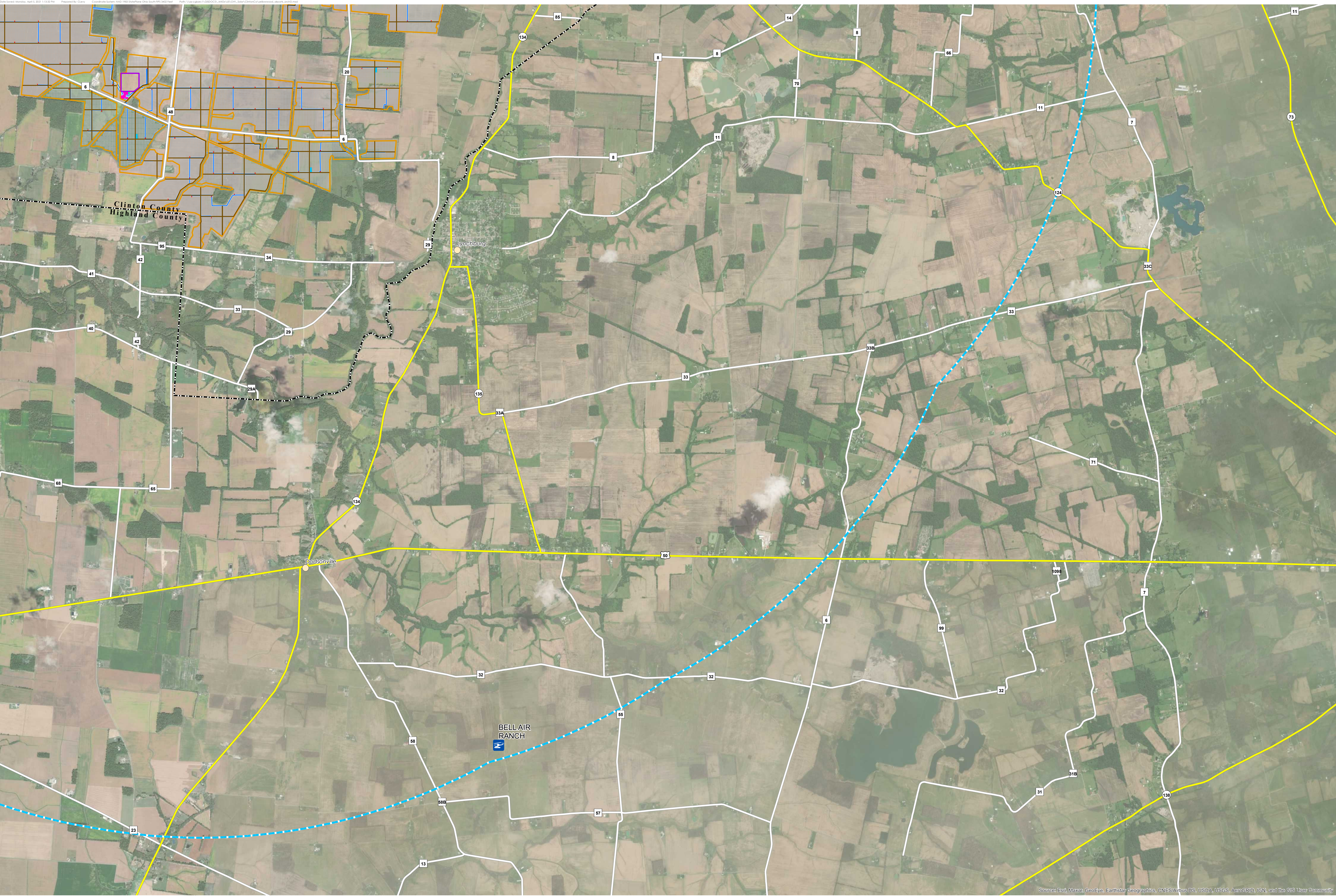
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 - O&M Building
 - Switchyard
 - Met Station

Airport Summary: Map 2

Yellow Wood Solar Energy Center | Clinton County, Ohio

Rev. 00
April 05, 2021



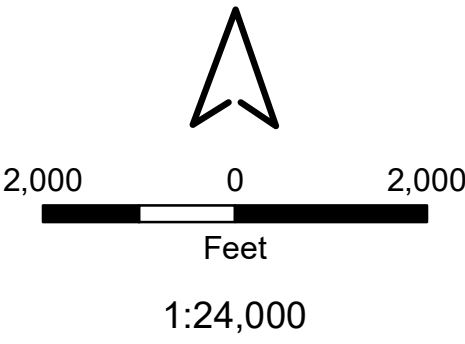
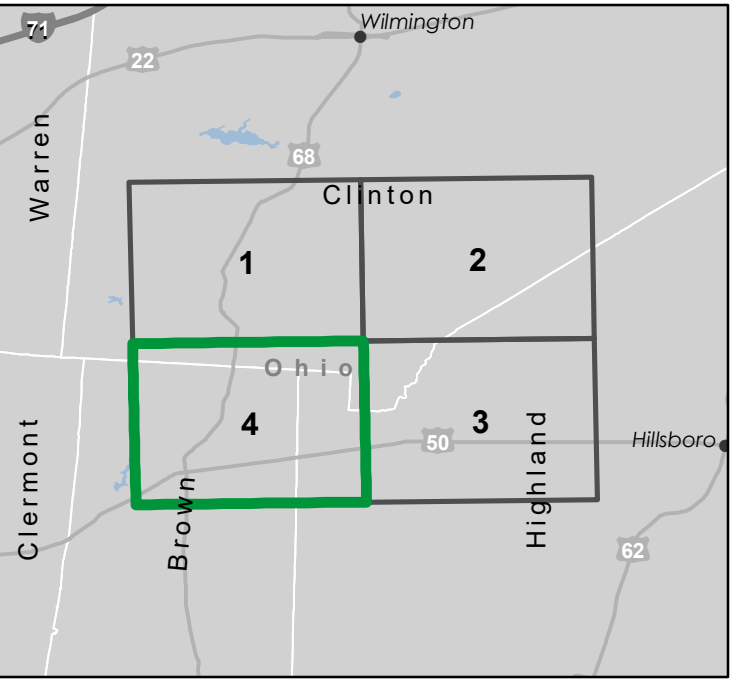


Airport Summary: Map 3

Yellow Wood Solar Energy Center | Clinton County, Ohio

Rev. 00
April 05, 2021





- Legend**
- City
 - NFDC Facility**
 - Airport
 - Helipoint
 - Road Classification**
 - US/State Route
 - County Road
 - County Boundary
 - Yellow Wood 5 mile Buffer
 - Project Layout**
 - Collection
 - Solar Array
 - Substation
 - Fence Line
 - Inverters
 - Access Road
 - O&M Building
 - Switchyard
 - Met Station

Airport Summary: Map 4

Yellow Wood Solar Energy Center | Clinton County, Ohio

Rev. 00
April 05, 2021



Attachment 4

Sample Emergency Response Plan



Hardin Solar

Emergency Response Plan

This document ("Procedure") has been prepared by RES America Construction Inc. ("RES") in accordance with internal procedures and mandates and is Confidential Information. If this Procedure is an exhibit to a contract or agreement, then this Procedure, in the form attached to the contract, shall be subject to only those express representations or warranties regarding the exhibits to such contract, if any. Except for such representations, RES provides this Procedure "AS-IS" and does not represent, and RES expressly disclaims, that the procedures or material contained in this Procedure have been prepared pursuant to any methodology, are accurate or complete, or that they reflect the status of applicable law. Portions of this Procedure may be excerpted or redacted, and this Procedure is subject to revision or update at any time. Any party utilizing this Procedure, or any matter or information derived from it, ("Recipient") does so at his/her/its own risk and agrees to make his/her/its own investigation regarding his/her/its legal or other obligations for performance of his/her/its work. No Recipient shall have any right or claim against RES or any of its affiliated companies with respect to the Procedure.

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TITLE: Emergency Response Plan	DOC No:	REV No: 01
	PAGE: 1 of 25	DATE: 08/30/19

Revision History

Revision #	Date	Nature of Revision
01	08/30/19	Document first created.

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1.0 INTRODUCTION

Renewable Energy Systems (hereafter referred to as “RES”) is constructing a 150 MWac solar project in Alger, OH. The Coordinate System is 40° 39'36.80"N, 83° 49'59.91"W.

RES has developed this Emergency Response Plan for use during the construction phase of the project.

2.0 PROJECT DESCRIPTION

The works will comprise the installation of batteries, the construction of associated foundations, access tracks and electrical infrastructure and the applicable grid connection.

The elements of the site work for the RES project shall comply with all federal and provincial regulatory requirements.

3.0 PROCEDURE

3.1 Safety Related Incident/Emergency Notification Procedure

3.1.1 Asses the emergency

3.1.2 Notify emergency services and site safety

- a) If there is a potentially life-threatening injury or scenario, the first step is to call 911 directly.
- b) Then contact the RES Safety Supervisor and Subcontractor/Owner Safety Representative by radio or cell phone depending on available services at site.
- c) If the injury or scenario is not life threatening, contact the nearest Supervisor, as well as the RES Safety Supervisor and Subcontractor/Owner Safety Representative by radio or cell phone depending on available services at site.

3.1.3 Describe the emergency scenario. Typically, the categories below can be used:

- a) Incident type (e.g. fall, crush, vehicular accident, fire, electrical shock)
- b) Potential fatality
- c) Major illness (e.g., heart attack, not breathing, unconsciousness)
- d) Major injury (e.g., broken bone, loss of limb, severe cuts/bleeding)
- e) Minor injury (e.g., twisted ankle, foreign body in eyes, minor cuts)

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- f) Bite/sting (e.g., snake, scorpion, wasp)
- g) Weather effect (e.g., heat or cold stress, lightning strike)

3.1.4 Identify location

- a) Provide the location of the emergency, by referring to the nearest structure or road junction.

3.1.5 Determine appropriate response

- a) Unless the injury is a life-threatening injury, the Supervisor, RES Safety Supervisor, and Subcontractor/Owner Safety Representative will determine the appropriate response, which may be:
 - (1) Arrange for a site First Aid Trained Employee to respond to the location of the injured.
 - (2) Arrange for transport of the injured to the site safety trailer for first aid administration, and further evaluation.
 - (3) Arrange for site transport to take the injured to a hospital or local medical clinic.
 - (4) Arrange for 911 services to respond directly to the injured employee.

3.1.6 Coordinate

- a) Send an employee to the nearest site access point to meet the emergency responders and escort them to the location of the emergency.
- b) If offsite 911 responders are notified, the RES Safety Supervisor and Subcontractor/Owner Safety Representative will coordinate in directing the emergency services to the scene of the incident.

3.1.7 Accompany

- a) The First Aid Trained Employee, Supervisor, RES Safety Supervisor, and Subcontractor/Owner Safety Representative will continue to assist with the emergency scenario.
- b) If the decision is made to transport the employee directly to an offsite hospital or medical clinic (either by site transport or by 911 emergency responders), the employees' Supervisor, the RES Safety Supervisor (or designee), and the Subcontractor/Owner Safety Representative shall:
 - (1) Accompany the injured employee to the hospital.

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- (2) Stay with the injured employee until examination (including a drug and alcohol test) is complete, and the diagnosis is completed (so that a full report including the extent of the potential injuries can be made).
- (3) Supervisors shall make known to the treating medical practitioners the employee's typical work duties, the availability of oversight for the employee's return to duty, and alternate duties available to the employee.

3.1.8 Notify Employer

- a) The employee's Supervisor shall notify the employee's employer and emergency contact.
- b) RES Safety shall notify RES Corporate HSQE and the RES Project Manager within established time frames.
- c) Subcontractor/Owner Safety Representative shall notify the Owner within established time frames.

3.2 Designated Medical Facility

- 3.2.1 RES has designated an Urgent Care Clinic for nonemergency, occupational health related injuries and illnesses.

FACILITY NAME	ADDRESS	PHONE NUMBER
Lima Memorial Occupational Health Lima Memorial Professional	Office Building I 1220 East Elm Street, Suite 106 Lima, OH 45804	(419) 226-5180

- 3.2.2 If the clinic is not available when needed during early, late, or weekend work hours, the hospital identified below will be utilized:

FACILITY NAME	ADDRESS	PHONE NUMBER
Hardin Memorial Hospital	921 E Franklin St, Kenton, OH 43326	(419) 675-8100

- 3.2.3 RES will determine if any restrictions recommended by medical staff affects one or more of the employee's routine job functions.
- 3.2.4 The treating physician's diagnosis shall be the basis for initiating claims unless the contractor has alternative arrangements for assessment of fitness for duty.

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- 3.2.5 RES subcontractors shall log any alternate arrangements for medical treatment facilities with RES. This procedure is in the interests of both the employee (as it ensures they get the best treatment) and the employer (as they know that their employees are seen by a competent physician).

3.3 Damage Incident (No Injury)

3.3.1 NOTIFY SUPERVISOR

- a) Contact the nearest Supervisor or RES employee, preferably the RES Safety Supervisor, by radio or cell phone depending on the services available at the site.

3.3.2 DESCRIBE

- a) The nature of the damage.
- b) The location of the damage incident, by referring to the nearest structure or road junction.

3.3.3 STOP WORK

- a) Stop all work in an area of damage until RES Safety Supervisor arrives to investigate incident. Equipment and vehicle operators should stay near the vehicle.
- b) Any employee involved in an equipment or vehicle accident resulting in injury or damage to equipment/property shall submit to an immediate alcohol/drug test. Testing shall be coordinated by the RES Safety Supervisor.

3.4 Spill Response Procedure

- 3.4.1 Immediately report any releases of hazardous materials to your Supervisor and the RES Project Manager.

- 3.4.2 The site Spill Prevention, Control, and Countermeasure (SPCC) plan shall be followed when a spill occurs on site that involves any oil products. Specific guidance for reporting the spill is contained in the SPCC plan.

3.4.3 In case of Spill to Land:

- a) Stop all work in vicinity of spill.
- b) Identify the product - check container design, warning labels, markings, etc.

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- c) Prevent personnel from approaching the site and keep them at a distance sufficiently removed that they will not be injured by, or cause, a fire or explosion.
- d) Install measures to contain the spill if it is safe to do so utilizing a spill kit as appropriate.
 - (1) A spill kit shall include: Poly containment pail, oil absorbent pads, oil absorbent socks, heavy duty disposal bags, nitrile gloves, all-purpose absorbent (such as sawdust or kitty litter), shovels, plugs and clamps (zip ties) to control a line break.
- e) Wait for further instructions from responding personnel.

3.4.4 In case of Spill to **Water**:

- a) Stop all work in vicinity of spill.
- b) Identify the product - check container design, warning labels, markings, etc.
- c) Prevent personnel from approaching the site and keep them at a distance sufficiently removed that they will not be injured by, or cause, a fire or explosion.
- d) Install measures to contain the spill if it is safe to do so.
- e) Wait for further instructions from responding personnel.

3.5 Site Evacuation Procedure

3.5.1 Site-wide evacuations can be ordered by:

- a) The RES Project Manager.
- b) The Owner.

3.5.2 Evacuation of local work areas can be ordered by the Supervisor of the work, following notification to RES Safety consistent with the reporting process above.

3.5.3 Notification of a site-wide evacuation shall be by cell phone and verbal communication.

3.5.4 When instructed to evacuate, all employees shall proceed to the Muster Point.

3.5.5 The RES Project Manager (or designee) will arrange a head count of all personnel. This will be completed by the supervisors from each contractor.

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- 3.5.6 Employees that remain after an evacuation to shut down or maintain critical operations shall perform the necessary operations and evacuate as soon as possible.

3.6 Fire Prevention Procedures

3.6.1 Notification

- a) All fires shall be immediately reported to the task Supervisor and the RES Safety Supervisor consistent with reporting process above.
- b) The RES Safety Supervisor shall coordinate the emergency response for the fire.

3.6.2 Specific Construction Site Fire Hazards

- a) Possible fire hazards and threats include grass fires due to lightning, failure of overhead lines, and construction-related accidents such as sparks from cutting operations and vehicular operation over dry vegetated areas.

3.6.3 Minimizing Fire Risk during Construction

- a) Personnel Training - All site personnel shall be made aware of the dangers associated with fires and how to respond in case of a fire.
- b) No open fires - No exceptions.
- c) Hot Work - shall be conducted following issuance of a Hot Work Permit, conducted in accordance with approved procedures, and within de-vegetated areas only.
- d) Storage and use of flammable and combustible materials will be in accordance with [RASWP 021 - Fire Prevention](#).
- e) Fire-breaks shall be a design feature:
 - (1) Each road will be considered a site fire break.

3.6.4 Suppression of Fires during Construction

- a) Employees should attempt to extinguish a fire if possible, but never at risk to their personal safety or the safety of fellow employees.
- b) Portable Fire Extinguishers - Each site vehicle shall be equipped with an ABC rated fire extinguisher.
- c) Each piece of construction equipment (yellow iron or similar) shall be equipped with, or have available during operation, an ABC rated fire extinguisher, if it doesn't affect the safe operation of the equipment.

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- d) Any fire not immediately contained and/or suppressed shall require notification to the local fire department for support.
- e) Water availability - **[TBD]**

3.7 Fire Prevention and Response Equipment Maintenance and Inspections

- 3.7.1 All installed fire prevention or fire response equipment shall receive monthly inspections (with records) and regular maintenance in accordance with provincial requirements.
- 3.7.2 All RES personnel and subcontractors carrying fire extinguishers in their vehicles are responsible for conducting a monthly inspection of the extinguishers to ensure the equipment is in good working order and ready for use in a fire emergency.

4.0 SAFETY DATA SHEETS

4.1 Location and Posting

- 4.1.1 Each subcontractor shall maintain a listing of all materials that they are using which may be flammable or hazardous to health. Therefore, refer to each subcontractor for the most comprehensive and up-to-date listing together with the Safety Data Sheets (SDSs) for each chemical.
- 4.1.2 The location of the SDSs maintained on site shall be posted on the project information board.

5.0 SPECIFIC PROCEDURES FOR KNOWN SITE HAZARDS

5.1 Snake Bite Procedures

- 5.1.1 What to do if bitten by a venomous snake.
 - a) Allow the bite to bleed freely for 15-30 seconds.
 - b) Cleanse and rapidly disinfect the area with an iodine solution (if not allergic to iodine, fish, or shellfish), and remove clothing and jewelry from the body extremity where the bite occurred (pant legs, shirt sleeves, rings, etc.)
 - c) If bite is on the hand, finger, foot, or toe - wrap the leg/arm rapidly with 3" to 6" of ACE or crepe bandage past the knee or elbow joint immobilizing it. Over-wrap bite marks. If possible, apply hard and direct pressure over bite using a 4" x 4" gauze pad folded in half twice to 1" x 1". Tape in place with adhesive tape. Soak gauze pad in Betadine™ solution if available and victim is not allergic to iodine, fish or shellfish.

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- d) Strap gauze pad tightly in place with adhesive tape.
- e) Over-wrap dressing above, over, and below bite area with ACE or crepe bandage, but not too tight. Wrap ACE bandage as tight as one would for a sprain. Not too tight. Check for pulse above and below elastic wrap; if absent, the wrap is too tight. Unpin and loosen. If pulses are strong (normal), it may be too loose.
- f) Immobilize bitten extremity use splinting if available.
- g) If possible, try and keep bitten extremity at heart level or in a gravity-neutral position. Raising it above heart level can cause venom to travel into the body; below heart level can increase swelling.
- h) Evacuate to nearest hospital or medical facility as soon as possible.
- i) Try to identify the snake (ONLY if safe to do so). This is the least important thing you should do. Visual identification/description usually suffices, especially in the U.S. and in regions where the local fauna is known. Local symptoms will alert doctors to whether or not the bite is venomous.
- j) Bites to face, torso, or buttocks are more of a problem. ACE or crepe bandaging cannot in these areas. A pressure dressing made of a gauze pad may help to contain venom.

5.1.2 What to Communicate at the Hospital.

- a) Ask the staff to immediately contact their designated Poison Control Center.
- b) Ask the hospital staff to use physician consultants available through the nationwide Poison Control Network if necessary.

5.1.3 What **NOT** to do if bitten by a venomous snake.

- a) Contrary to advice given elsewhere, do not permit removal of pressure dressings or ACE bandages until you are at the treatment facility and the physician is ready and able to administer anti-venom. When the dressings are released, the venom will spread causing the usual expected problems associated with a venomous snakebite.
- b) Do **not** eat or drink anything.
- c) Do **not** engage in strenuous physical activity.
- d) Do **not** apply oral/mouth suction to the bite.
- e) Do **not** cut into or incise bite marks with a blade.
- f) Do **not** drink any alcohol or use any medication.
- g) Do **not** apply hot or cold packs.

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- h) Do **not** apply a narrow, constrictive tourniquet such as a belt, necktie, or cord.
- i) Do **not** use a stun gun or electric shock of any kind.
- j) Do **not** remove dressings/wraps until arrival at hospital and anti-venom is readily available.

5.2 Tornadoes

5.2.1 Tornado Categories

- a) (F0) Gale Tornado (40-75 mph) - Light damage: Some damage to chimneys, breaks branches off trees, pushes over shallow-rooted trees and damages sign boards.
- b) (F1) Moderate Tornado (73-112 mph) - Moderate damage: The lower limit (73 mph) is the beginning of hurricane wind speed, peels surfaces of roofs, mobile homes pushed off foundations or overturned and moving autos pushed off roads.
- c) (F2) Significant Tornado (112-157) - Considerable Damage: Roofs torn off the frames of houses, mobile homes demolished, boxcars pushed over, large trees snapped, and heavy cars lifted off ground and thrown.
- d) (F3) Severe Tornado (158-206 mph) - Severe Damage: Roofs and some walls torn off well-constructed houses, trains overturned, most trees in forest uprooted, and heavy cars lifted off ground and thrown.
- e) (F4) Devastating Tornado (207-260) mph - Incredible damage: Well-constructed houses levelled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.
- f) (F5) Incredible Tornado (261-318) mph - Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile sized missiles fly through the air in excess of 100 meters; trees debarked; steel re-enforced concrete structures badly damaged.
- g) (F6+) Inconceivable Tornado (319-379 mph) - These winds are very unlikely. The small area of damage they might produce would probably not be recognizable along with the mess produced by F4 and F5 wind that would surround the F6 winds. Missiles, such as cars and refrigerators would do serious secondary damage that could not be directly identified as F6 damage. If this level is ever achieved, evidence for it might only be found in some manner of ground swirl pattern, for it may never be identifiable through engineering studies.

5.2.2 Phase 1 - Preparation

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- a) When the National Weather Service issues a Tornado watch (48 hours prior to forecasted landfall), RES and subcontractors shall begin preparations for a shut-down of operations.
- b) RES Project Manager and Safety Supervisor will notify RES and subcontractor personnel and actively monitor storm progress.
- c) Upon notification by RES Project Manager, all Subcontractors will begin a general clean-up effort to eliminate, remove, or secure any loose objects around site including tools, equipment, materials, trash cans, etc.
- d) RES and subcontractor administrative support will prepare documents, for proper storage or removal, and secure paperwork and office equipment.

5.2.3 Phase 2 - Monitoring

- a) When the National Weather Service issues a tornado watch (48 hours prior to forecasted landfall), RES Project Manager and Safety Supervisor will continue to monitor the storm activities and will advise site personnel of the appropriate actions to take in the event Phase 3 is implemented.

5.2.4 Phase 3 - Evacuation

- a) When the National Weather Service issues a Tornado Warning (24-36 hours prior to the forecasted landfall), RES Project Manager and Safety Supervisor will ensure that all preparations for the storm and shut-down of operations have been completed.
- b) The site will be immediately evacuated to the nearest Certified Tornado Shelter.

5.2.5 Phase 4 - Returning to Work

- a) The Project Manager will begin the implementation of Phase 4 within 12 hours after the Tornado has passes and/or upon confirmed safe conditions of project site.
- b) The Project Manager will notify each designated company contact.
- c) Each subcontractor's designated company contact will alert their company's personnel that they shall return to work.

5.2.6 Damage reports and priority repairs will begin immediately, and crews will be assigned accordingly.

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6.0 EMERGENCY SERVICES

6.1 In case of Emergency (Fire/Police/Medical)

911

FACILITY NAME	ADDRESS	PHONE NUMBER
Hardin Memorial Hospital	921 E Franklin St, Kenton, OH 43326	(419) 675-8100
Hardin County Sheriff	1025 S Main St, Kenton, OH 43326	(419) 673-1268
Alger Fire Department	102 Lee St, Alger, OH 45812	(419) 757-2222

6.2 Emergency Response Drill

- 6.2.1 At least one emergency response drill shall be completed within ninety (90) days of mobilizing to site that engages the local emergency service providers in the community. Lessons learned shall be communicated across the project at the Plan of the Day (POD) Meetings, All Hands Safety Meetings, and Staff Meetings. Needed improvement areas shall be incorporated into the next revision of the plan.

7.0 APPENDICES

Appendix 1 - Site Contact Information

Appendix 2 - FA/CPR/AED Trained Employees

Appendix 3 - Concise Emergency Response Plan

Appendix 4 - Radio Communications for Severe Weather - Lightning

Appendix 5 - Site Map

Appendix 6 - Occupational Clinic Map and Directions

Appendix 7 - Urgent Care Map and Directions

Appendix 8 - Hospital Map and Directions

Appendix 9 - Utility Strike Emergency Response

Appendix 10 - Active Shooter Response

Appendix 1 - Site Contact Information

COMPANY	TITLE	NAME	PHONE NUMBER
RES	Project Manager	Kola Ogundeyin	(404) 790-6822
RES	Assistant PM	Trevor Williams	(512) 922-1387
RES	Project Superintendent	Terry Ashline	(701) 840-8234
RES	Project Engineer	Luther Martin	(409) 893-5744
RES	Safety Supervisor	Sharlon Wright	(806) 893-2966
RES	HSQE Manager	Steve Sloat	(203) 417-9431
RES	Quality Supervisor	Danny Anderson	(423) 863-2158
RES	Civil Superintendent	Chris Edwards	(417) 483-1290
RES	Civil FE	David Waldron	(320) 761-0431
RES	Electrical Superintendent	Matthew McAlpin	(320) 423-6581
RES	Electrical FE	Jacob Spenner	(515) 782-1489
RES	Mechanical Superintendent	Todd Fodor	(951) 852-1112
RES	Mechanical FE	TBD	TBD
RES	Mechanical GF	Johnny Rutherford	(408) 710-2374
RES	Site Mechanic	Justin Wallace	(870) 341-3258
RES T&D	Project Manager	Mike Repholz	(518) 577-8201
RES T&D	Civil Superintendent	Sean Charrette	(607) 761-5456
RES	Site Admin	Diana Bame	(419) 604-0067

Appendix 2 - FA/CPR/AED Trained Employees

COMPANY	NAME	PHONE NUMBER
RES	Sharlon Wright	806-893-2966
RES	Jacob Spenner	515-782-1489
RES	Johnny Rutherford	408-710-2374
RES	Jake Ashline	701-840-9046

Appendix 3 - Concise Emergency Response Plan

Hardin Solar

1. Know your location on site.
2. Be prepared to communicate the road, intersection, compound, structure, etc.
3. If the emergency is immediately dangerous to life or health, call 911.
4. If not, notify your immediate supervisor.
5. Then, notify a RES Supervisor.
6. If a RES Supervisor is not available, notify the RES Project Office via phone or radio.

Radio Communications:

1. Ensure you are on the “talk-around” or “emergency” frequency.
2. Announce that you have an emergency and request all other communications to stop.
3. Request all activities on site to stop during the emergency response.
4. Call out for a RES Supervisor or other.
5. When a RES Supervisor (or other) responds, communicate slowly and clearly.
6. Communicate the type of emergency: Injury, Fire, Spill, etc.
7. Communicate the location.
8. If you have already called 911, communicate that to the RES Supervisor.

Injury/Illness:

1. Follow the prescribed steps described above ensuring you communicate your location and a brief description of the injury/illness.
2. If the emergency is immediately dangerous to life or health, call 911.
3. If you determine the injured or ill person needs FA/CPR/AED, request it.
4. Make sure the injured or ill person is being monitored. Never move an injured or ill person unless needed to prevent further injury.
5. Secure the immediate job site area if possible, shutting down all equipment and work. Request assistance if needed.
6. RES will dispatch personnel to assist with FA/CPR/AED.
7. RES will dispatch personnel to rendezvous with emergency services responding to the 911 call.
8. If the injured or ill person is a snake bite victim, try to identify the type of snake involved. If the snake has been killed, carefully secure the snake in a manner for transport to the hospital for identification by medical personnel.
9. The supervisor of the injured or ill employee should accompany the employee to the hospital. A RES Supervisor will also accompany employees transported to the hospital.

Fire:

1. Follow the prescribed steps described above ensuring you communicate your location and a brief description of the injury/illness.
2. If the emergency is immediately dangerous to life or health, call 911.
3. Do not put yourself at risk.
4. Clear the area of unnecessary personnel and, if possible, vehicles and flammables. If you are trained in fire safety, and the fire is small, attempt to put the fire out with an extinguisher.
5. RES will dispatch personnel to rendezvous with emergency services responding to the 911 call.
6. Await the arrival of the fire department.

Severe Weather:

1. If a severe weather emergency occurs at your work location and you have not received notification verbally, via cell phone, or on the radio system, follow the prescribed steps described above for notifying your supervisor and/or a RES Supervisor.
2. If you receive notification of a severe weather event verbally, via cell phone, or on the radio system; follow the instructions.
3. For lightning, take cover in mobile equipment, a vehicle, or structure (O&M building, office trailer, etc.). Do not use the equipment/vehicle's electronic devices while taking cover during a storm.

Spills to Land or Water:

1. Follow the prescribed steps described above for notifying your supervisor and/or a RES Supervisor.
2. Communicate the location and a brief description of the spill emergency.
3. Stop all operations.
4. Identify the product.
5. Prevent personnel from approaching the site.
6. Install measures to contain the spill if it is safe to do so.
7. Wait for further instructions from responding personnel.

Appendix 4 - Radio Communications for Severe Weather - Lightning

Hardin Solar

Items in red are information only and not to be read over radio.

****50 Mile Weather Advisory****

Attention All Site:

We are currently under a condition **YELLOW**. Lightning has been reported within 50 miles of the project. Again we are currently under a condition **YELLOW** for lightning within 50 miles. Repeat 3 times over a 2 or 3 minute period when lightening is within 50 miles of site. Work will continue during an advisory. Preparations should be made to stop work if storm continues towards site.

****30 Mile Weather Caution****

Attention All Site:

We are currently under a condition **ORANGE** for lightning within 30 miles of the site. Crews should prepare to stop works should lighting strike within 10 miles of the project. Again we are currently under a condition **ORANGE** for lightning with 30 miles. Repeat 3 times over a 2 or 3 minute period when lightning is within 30 miles of site. All Main Crane and Tower work is to cease immediately.

****10 Mile Weather Warning or if Thunder is Heard****

Attention All Site:

We are currently under a condition **RED** for lightning within 10 miles of the site. All site personnel must IMMEDIATELY cease their operations and seek shelter in any rubber tired vehicle/piece of equipment or the nearest safe building (e.g., site office trailers). Again we are under a condition **RED** for lightning within 10 miles. Repeat 3 times over a 2 or 3 minute period when lightning is within 10 miles of site or if Thunder is heard. ALL site operations are to cease immediately and personnel should seek shelter.

****Lightning All Clear****

Attention All Site:

We are currently under a condition (**ORANGE** or **YELLOW** or **GREEN**). No lightning has been observed within (10 or 30 or 50) miles of the site in the last 30 minutes.

10 Mile All Clear, but lightning still within 30 Miles. We are currently under a Condition **ORANGE**. Ground operation crews may return to work. Again, we are currently under condition **ORANGE**.

30 Mile All Clear, but lightning still within 50 Miles. We are currently under a condition **YELLOW**. Maintain awareness because lightning is still within 50 Miles of the site.

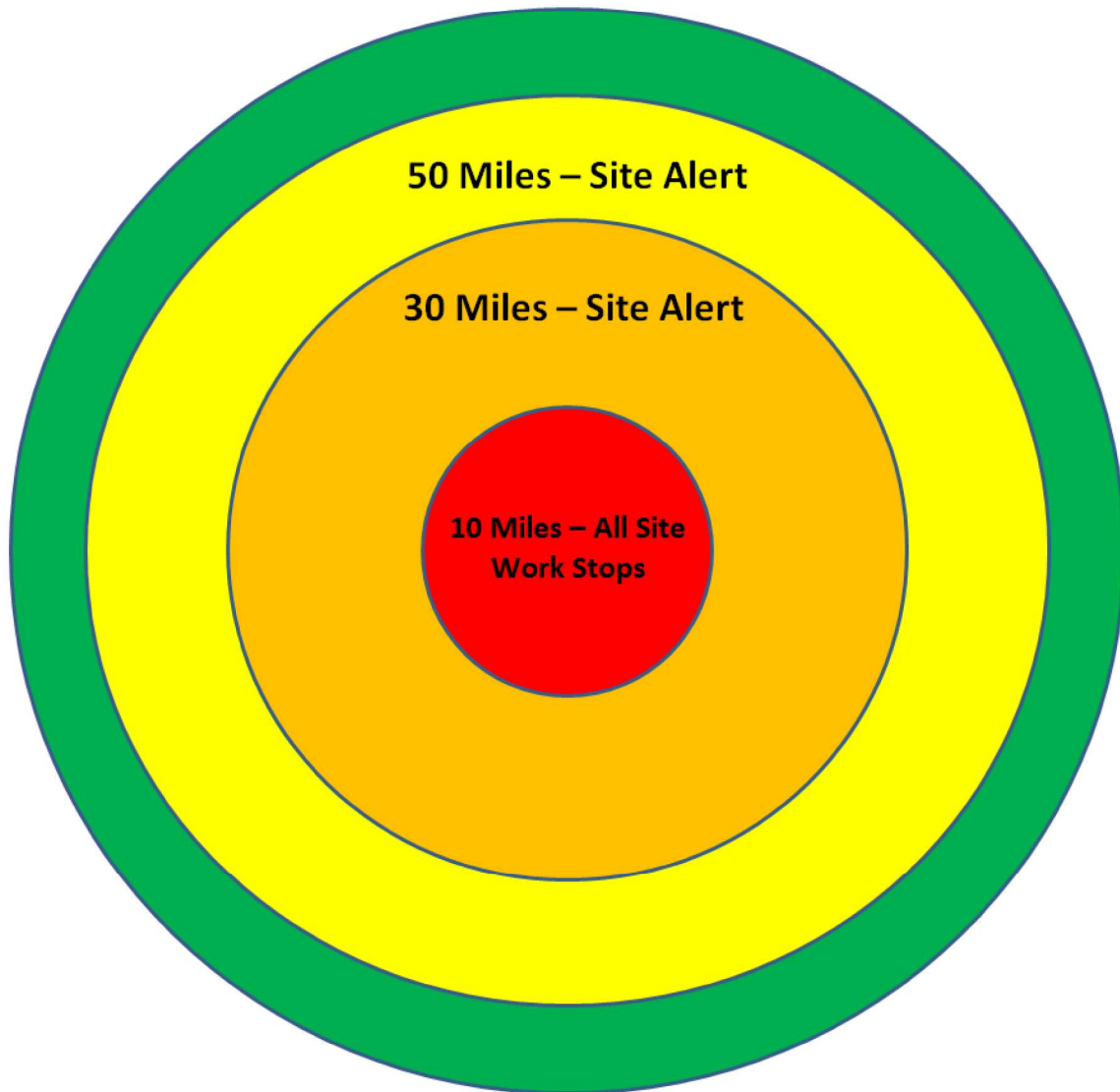
50 Mile All Clear, - We are currently under a condition **GREEN**. There has been no lightning within 50 miles in the last 30 minutes.

Repeat the specific all clear announcement (10, 30, 50 mile) 3 times over a 2 or 3 minute period once the RES Project Office gets confirmation of all clear. An all clear will be announced once no strikes have been reported in the 10, 30, and 50 mile radius for 30 minutes.

***Only the Project Manager has the authority to extend the time period before declaring an "ALL CLEAR" notice.

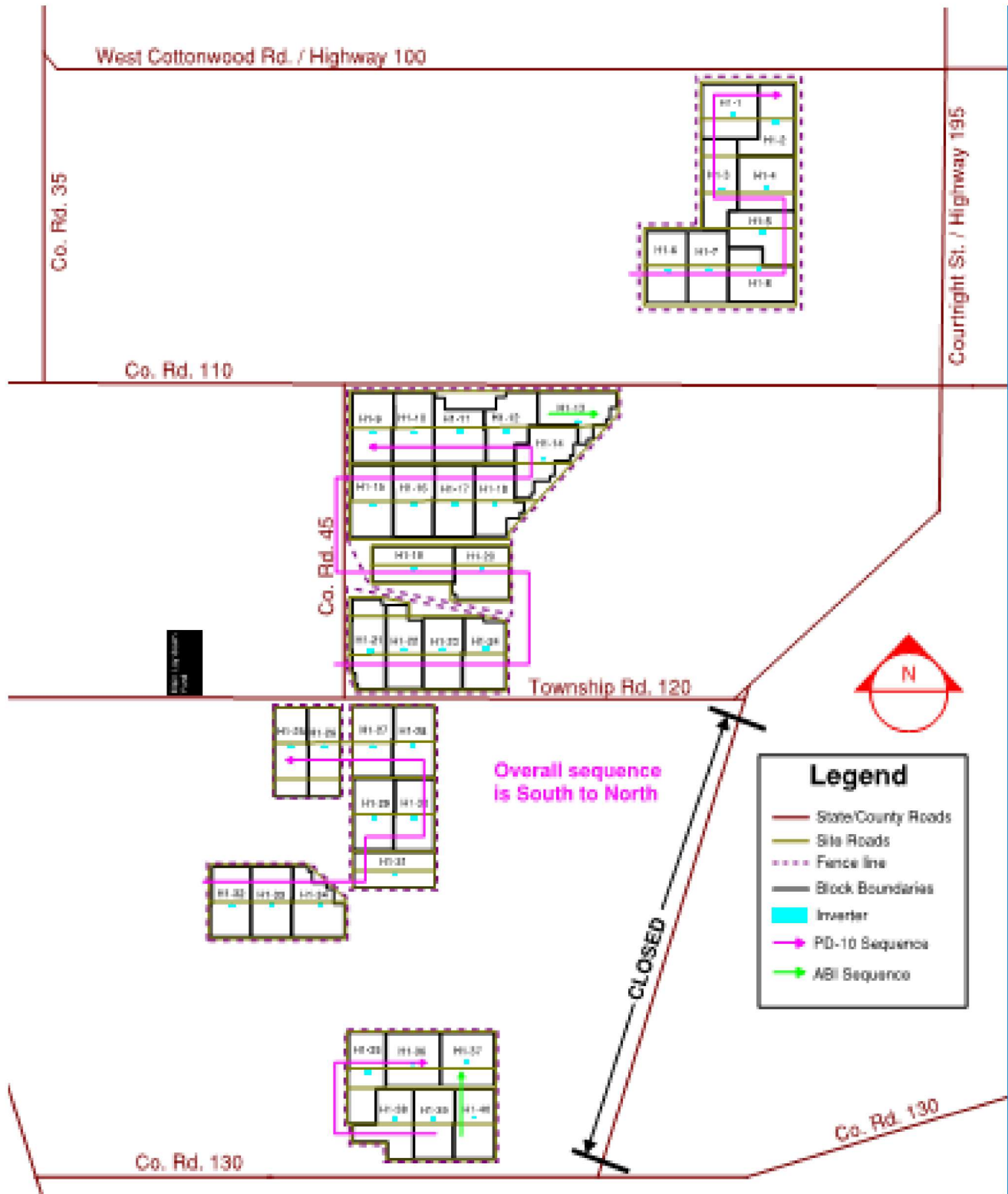
Lightning Alert Pictogram

Hardin Solar



Appendix 5 - Site Map

Hardin Solar



Appendix 6 - Occupational Clinic Map and Directions

**Lima Memorial Occupational Health
Lima Memorial Professional Office Building I
1220 East Elm Street, Suite 106
Lima, OH 45804
(419) 226-5180**

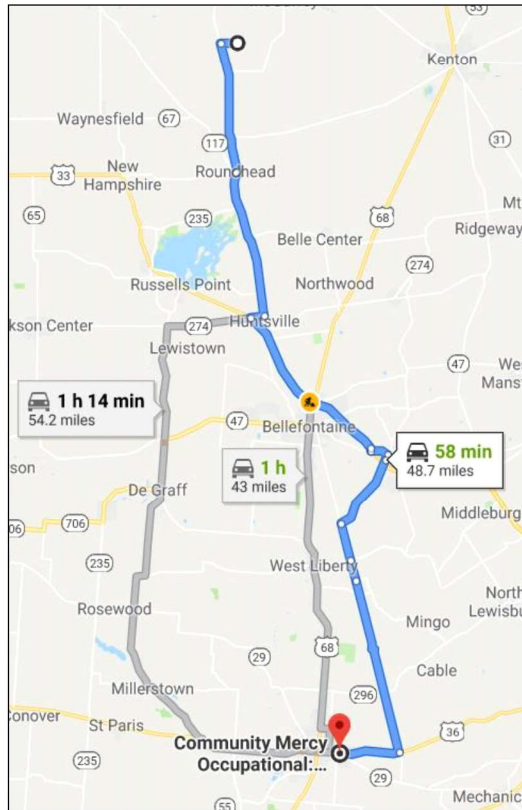


Directions

1. Head west on Township Rd 120 toward OH-235 N - 0.9 mi
2. Turn right onto OH-235 N - 2.1 mi
3. Turn left onto Township Rd 100 - 1.2 mi
4. Turn right onto County Line Rd/S Hardin Rd - 3.0 mi
5. Turn left onto OH-309 W - 10.7 mi
6. Turn right onto S Dana Ave - 0.3 mi
7. Turn left onto E Elm St 0.2 mi

Appendix 7 - Alternate Occupational Clinic Map and Directions

Community Mercy Occupational Health & Medicine
904 Scioto St, Urbana, OH 43078
(937) 484-6142

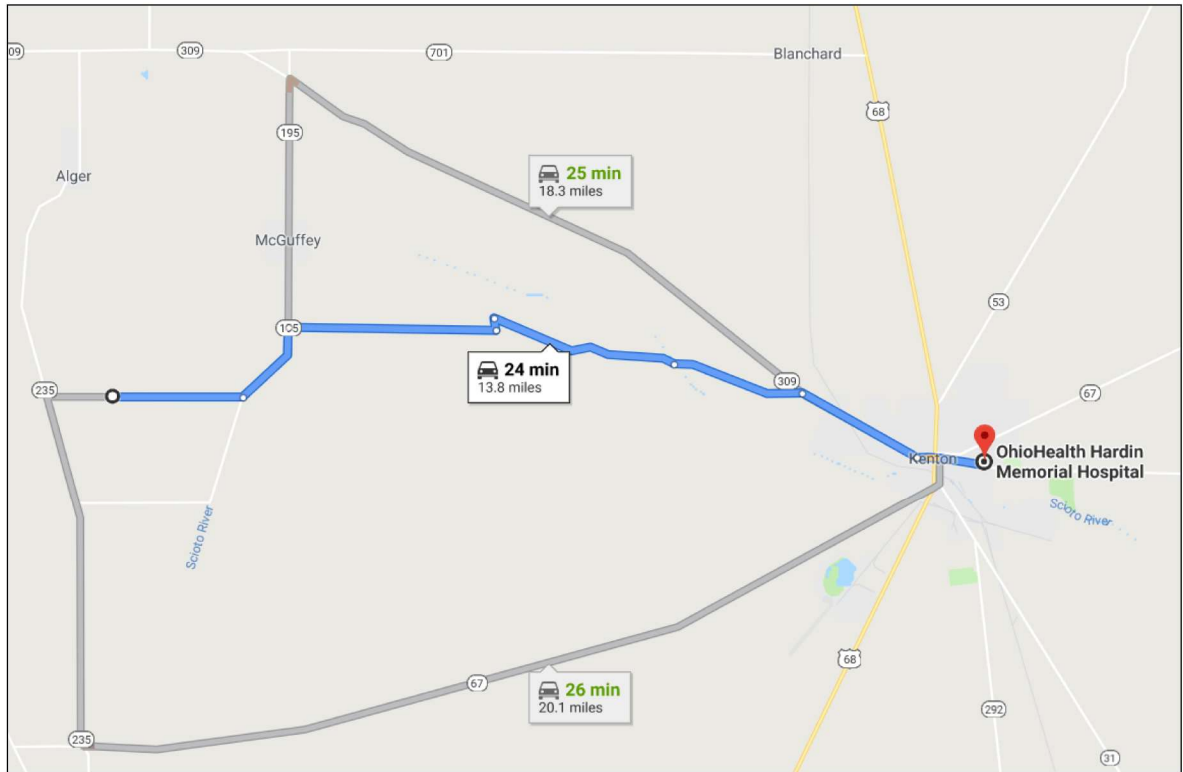


Directions

1. Head west on Township Rd 120 toward OH-235 N - 0.9 mi
2. Turn left onto OH-235 S - 7.1 mi
3. Turn right to stay on OH-235 S - 482 ft
4. Turn left onto OH-117 E/OH-235 S - 8.0 mi
5. Turn right onto OH-274 W - 0.7 mi
6. Sharp left onto US-33 E - 9.9 mi
7. Take the County Rd 10 exit toward Zanesfield/Bellefontaine - 0.2 mi
8. Turn left onto Co Hwy 10/Co Rd 10 - 1.0 mi
9. Turn right onto Main St - 0.3 mi
10. Continue onto County Rd 5 S - 4.4 mi
11. Turn left onto County Rd 1 - 2.1 mi
12. Continue onto OH-245 E - 1.2 mi
13. Continue straight onto N Ludlow Rd - 9.6 mi
14. Turn right onto US-36 W/E US Hwy 36 - 3.3 mi
15. Turn right, Destination will be on the left.

Appendix 8 - Hospital Map and Directions

Hardin Memorial Hospital
921 E Franklin St,
Kenton, OH 43326
(419) 675-8100



Directions

1. Head east on Township Rd 120 toward Co Rd 45 - 1.9 mi
2. Turn left onto OH-195 N - 1.3 mi
3. Turn right onto Co Rd 110 - 3.0 mi
4. Turn left onto Co Rd 95 - 0.2 mi
5. Turn right onto Co Rd 106 - 2.7 mi
6. Keep right to stay on Co Rd 106 1.9 mi
7. Turn right onto OH-309 E - 1.9 mi
8. Slight left onto W Franklin St 0.9 mi
9. Turn left onto Memorial Ave - 144 ft
10. Turn right - 92 ft
11. Turn left - 141 ft, destination will be on the right

Appendix 9 - Utility Strike Emergency Response

Hardin Solar

General Requirements

1. If any services are damaged, the work shall immediately stop and inform RES, who shall contact the utility owner to advise them of the situation.
2. If there is a spill associated with the strike, follow Spill Response procedures outlined in the Spill Prevention, Control, and Countermeasure (SPCC) Plan.
3. In the event of a potential gas, natural gas, petroleum or propane utility strike:
 - a) Check for the following signs of a leak:
 - Hissing, roaring, or explosive sound
 - Flames appearing from the ground or water.
 - Vapor cloud/fog/mist.
 - Dirt/debris/water blowing out of the ground.
 - Liquids bubbling up from the ground or bubbling in water.
 - Distinctive, unusually strong odor of rotten eggs, skunk, or Petroleum.
 - Discolored/dead vegetation or snow above a pipeline right-of way.
 - Oil slick or sheen on flowing/standing water.
 - b) If there is a leak, stop work and evacuate the area to an upwind location and away from vapor clouds and flames.
 - c) Abandon equipment used in/near area.
 - d) Call RES Safety/Management.
 - e) RES office to notify 911 if applicable.
 - f) Don't do anything that could create a spark.
 - g) Keep employees, vehicles, and members of the public 1000' away from the area. Note: RES Safety, EMS, Security and Supervision to perform this function.
 - h) Barricade the area if necessary.
 - i) Stay upwind of blowing gas.
 - j) Do not try to extinguish a gas burning fire prior to shutting off supply unless there is a threat to life.
 - k) Never attempt to operate pipeline valves, as this could prolong/worsen incident or cause another pipeline leak.
 - l) Start 1000' out from the strike location, and while walking towards the strike, assess the air quality using a 4-gas meter.
 - m) While walking towards the strike location, if the 4-gas meter alarms, evacuate the area. Do not return to the strike location or authorize employees to access the strike location until the utility owner verifies that it is safe to enter the area.
 - n) If the 4-gas meter does not alarm, continue to walk towards the strike location assessing the air quality and document equipment readings on the JHA (Job Hazard Analysis).
4. In the event of an electrical utility strike:
 - a) Stop work immediately and warn all persons in the vicinity, including emergency and rescue personnel, that the ground and objects near the excavator, and equipment around the point of contact, may be energized.

- b) Contact the electrical utility operator and fire department immediately if a radio or phone is at hand. Otherwise, the operator must remain still and signal for help to relay a call for utility and emergency assistance.
- c) The operator must remain on the excavator or equipment.
- d) Personnel on the ground near the equipment involved or point of contact should remain still with both feet together. Don't touch the excavator, nearby equipment, structures or material.
- e) Evacuate the excavator and the area near the point of contact only after an official of the electric utility deems it is safe to do.
- f) If immediate evacuation is required due to threat of serious injury from fire, explosion or other hazard, jump clear of the equipment and land with both feet together. Move a safe distance away (at least 25 to 30 feet) using short hops or shuffling steps to keep both feet together.
- g) Do not try to disentangle cables from excavator buckets.
- h) Do not resume work until an electric utility official confirms the site is safe.

5. In the event of a telecommunications strike:

- a) Stop excavation and secure the area.
- b) Notify facility owner of the potential damage to copper/fiber cable.
- c) Do not examine or stare into broken/severed/ disconnected fibers/fiber cable.
- d) Move a safe distance away from a damaged fiber system (always assume that a laser signal is present).
- e) Place barricades around the fiber damage location to protect others from exposure.
- f) Do not view broken fiber cables with any optical instruments.

Appendix 10 - Active Shooter Response

Hardin Solar

General Requirements

1. In the event of an active shooter, affected employees shall immediately stop working.
2. Call 911 - (from an area of safety or concealment) and provide as much of the following information as possible:
 - Description of suspect(s) and possible location.
 - Number and the types of weapons.
 - Suspect's direction of travel.
 - Location and condition of any victims.
3. Evacuate - If there is an accessible escape path, attempt to evacuate the premises. Be sure to:
 - Have an escape route and plan in mind.
 - Evacuate regardless of whether others agree to follow.
 - Leave your belongings behind.
 - Help others escape, if possible;
 - Prevent individuals from entering the active shooter area;
 - Keep your hands visible;
 - Follow the instructions of any police officers;
 - DO NOT attempt to move wounded people;
 - Call 911 when you are safe.
4. Hide - If evacuation is not possible. Your hiding place should:
 - Be out of the shooter's view.
 - Provide protection from gunshots, such as behind a heavy desk.
 - If you trap you or restrict your options for movement (broom closet).
 - Lock the door.
 - Block the door.
 - Silence cell phones.
 - Remain Quiet.
5. Fight - If no other options exist, and there is imminent/immediate danger to yourself, take direct action against the shooter:
 - Remain calm.
 - If you have not already done so, call 911 and leave the line open.
 - Commit to your actions.
 - Act as aggressively as possible against the shooter.
 - Move with speed and force. Improvise weapons if time permits.
 - Continue to fight until the shooter is physically incapacitated.
6. Evacuate - Priority is always to evacuate. Once shooter is incapacitated leave the area immediately, taking as many people as possible with you.
 - Keep hands visible.
 - Do not group together once outside the building, in the event of a second shooter.
 - Follow all commands of law enforcement officials.

7. Regroup - When possible and safe to do so, account for all personnel and report this information through one person to law enforcement.
8. Report - As soon as possible and practical, report the incident.

Attachment 5

Updated Sound Analysis
Application Exhibit K
Hankard Environmental, Inc.
April 9, 2021

This update supersedes and replaces Application Exhibit K that was filed on February 24, 2021.

Pre-Construction Noise Analysis

for the proposed

Yellow Wood Solar Energy Center

April 9, 2021



Prepared for:

Yellow Wood Solar Energy LLC
Chicago, Illinois

Prepared by:

Hankard Environmental, Inc.
Verona, Wisconsin



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Executive Summary

This report describes the results of an analysis of the noise levels that are expected to be generated from the construction and operation of the Yellow Wood Solar Energy Center (Project or Facility). The Project is a photovoltaic solar electric generation facility to be located in Clinton County, Ohio, approximately 35 miles northeast of Cincinnati. The Project has a maximum generating capacity of 300 megawatts. During construction the Project will generate noise from the operation of typical equipment such as bulldozers and pile drivers. Sources of noise from the operation of the Facility include inverters, transformers, and cooling systems.

Noise emissions from the Project are subject to the provisions of the Ohio Administrative Code, Chapter 4906-4, which requires the Project to (1) measure existing ambient (background) noise levels prior to construction, and (2) predict noise levels from the construction and operation of the Project at sensitive receptor locations. The maximum noise level from Project operations at noise-sensitive receptors (e.g., residences) located within one mile of the Project is limited to the measured ambient noise level plus five A-weighted decibels (dBA).

Ambient noise levels were measured in September 2020 at eight locations near the proposed Facility. The average daytime and nighttime noise levels were 42 dBA and 33 dBA, respectively. This results in daytime and nighttime noise level limits of 47 dBA and 38 dBA, respectively (ambient plus 5 dBA).

Noise levels from the operation of the Facility were predicted at each of the 264 noise-sensitive receptors identified within one-half mile of the Project. Noise levels at more distant receptors will be lower than those reported herein, and well below the established limits. The primary sources of noise from the operation of the Facility would be the solar inverters located throughout the Facility and the primary step-up transformers located at the substation. The loudest operational noise level of 44 dBA is predicted to occur at a non-participating residence in the northeastern portion of the Project, and 43 dBA is predicted at a participating residence in the western portion of the Project. All predicted levels are below the 47 dBA daytime standard. Nighttime noise levels for all receptors were modeled with the substation step-up transformers as the only noise sources, as inverters and their cooling systems do not operate at night. The loudest predicted level among non-participating residences under this condition is 35 dBA, which is below the 38 dBA nighttime limit.

Noise levels from the construction of the Facility were predicted at each of the 264 noise-sensitive receptors identified within one-half mile of the Project and also at one worst-case location along the Project boundary. The noise levels range from 37 to 75 dBA for most activities, but can get as high as 82 dBA (instantaneous) when pile driving is taking place in the immediate area. At the Project boundary construction noise levels are predicted to be as high as 93 dBA during pile driving. Note that these are the levels expected when construction equipment is nearby and fully operational. Construction will be limited to daytime hours to the extent practicable, will take place for approximately 12 to 18 months, and will occur near any one receptor location for only a few weeks at a time.

1. Introduction

This report describes the results of a pre-construction noise analysis conducted by Hankard Environmental for the proposed Yellow Wood Solar Energy Center (Facility or Project). The general location of the Project is shown in Figure 1-1. The Project's maximum generating capacity is 300 megawatts. This analysis demonstrates that the Project satisfies the requirements of Chapter 4906-4 of the Ohio Administrative Code, *Certificate Applications for Electric Generation Facilities*, which require the Project to provide a study of pre-construction (existing) noise levels, a description of construction and operational noise levels at the nearest property boundary and at all noise-sensitive receptors located within approximately one mile of the Project boundary, and the measures that will be taken by the Project to mitigate noise emissions.

The following sections describe in more detail the noise regulation applicable to the Project, the Project site and the location of noise sensitive receptors, the results of the pre-construction ambient noise study, the methods and data used to predict construction and operational noise emissions, the predicted construction and operational noise levels, and the mitigative measures to be employed.

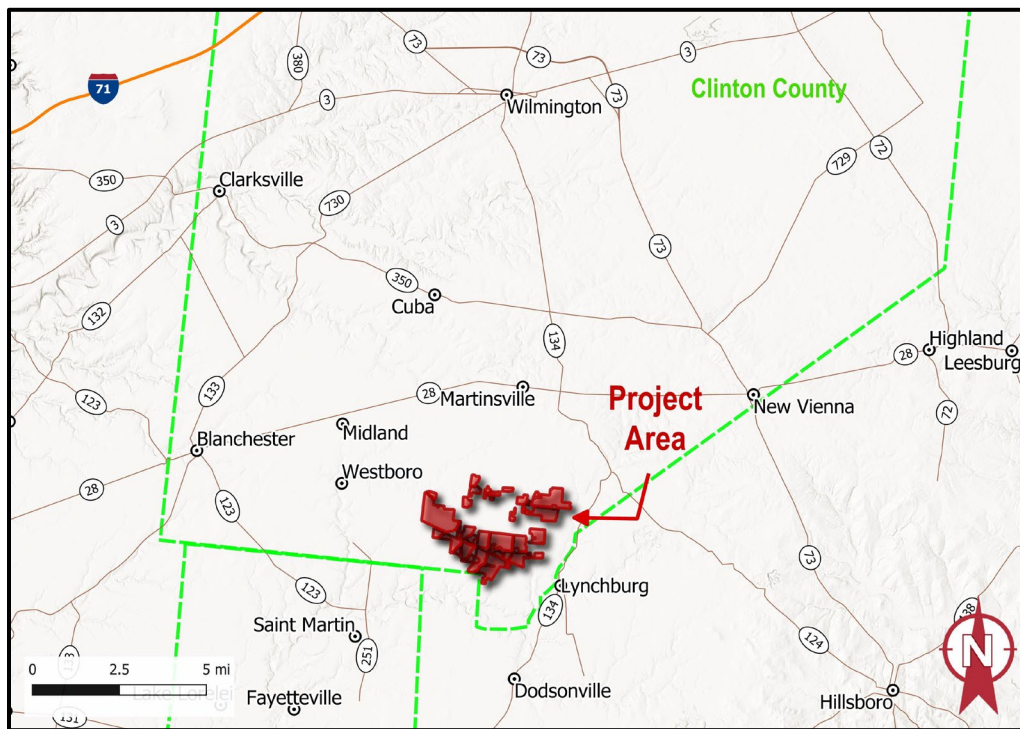


Figure 1-1. General Location of the Proposed Yellow Wood Solar Energy Center

2. Applicable Noise Regulation

Chapter 4906-4 of the Ohio Administrative Code, *Certificate Applications for Electric Generation Facilities*, sets forth the rules governing standard certificate applications for electric generation facilities. Section 4906-4-08, *Health and Safety, Land Use and Ecological Information*, describes the noise-related information required as part of a certificate application. Specifically, paragraph (A)(3) requires:

- (3) The applicant shall provide information on noise from the construction and operation of the facility.
 - (a) Describe the construction noise levels expected at the nearest property boundary. The description shall address:
 - (i) Blasting activities. (there is no blasting anticipated on this Project)
 - (ii) Operation of earth moving equipment.
 - (iii) Driving of piles, rock breaking or hammering, and horizontal directional drilling.
 - (iv) Erection of structures.
 - (v) Truck traffic.
 - (vi) Installation of equipment.
 - (b) Describe the operational noise levels expected at the nearest property boundary. The description shall address:
 - (i) Operational noise from generation equipment. In addition, for a wind facility, cumulative operational noise levels at the property boundary for each property adjacent to or within the project area, under both day and nighttime operations. The applicant shall use generally accepted computer modeling software (developed for wind turbine noise measurement) or similar wind turbine noise methodology, including consideration of broadband, tonal, and low-frequency noise levels.
 - (ii) Processing equipment.
 - (iii) Associated road traffic
 - (c) Indicate the location of any noise-sensitive areas within one mile of the proposed facility, and the operational noise level at each habitable residence, school, church, and other noise-sensitive receptors, under both day and nighttime operations. Sensitive receptor, for the purposes of this rule, refers to any occupied building.
 - (d) Describe equipment and procedures to mitigate the effects of noise emissions from the proposed facility during construction and operation, including limits on the time of day at which construction activities may occur.
 - (e) Submit a preconstruction background noise study of the project area that includes measurements taken under both day and nighttime conditions.

While there are no specific noise limits for solar farms in the Ohio Administrative Code, the Project has chosen to adhere to the limits outlined in Chapter 4906-4-09 *Regulations Associated with Wind Farms* Section F, Part 2, which states:

The facility shall be operated so that the facility noise contribution does not result in noise levels at any non-participating sensitive receptor within one mile of the project boundary that exceed the project area ambient nighttime average sound level (L_{eq}) by five A-weighted decibels (dBA). During daytime operation only (seven a.m. to ten p.m.), the facility may operate at the greater of: the project area ambient nighttime L_{eq} plus five dBA; or the validly measured ambient L_{eq} plus five dBA at the location of the sensitive receptor.

As described in Section 4, ambient noise levels were measured for approximately two weeks at four representative locations within the Project area. From this data an average daytime and nighttime L_{eq} were determined. As described in Section 7, predicted noise levels from the operation of the Facility at all nearby noise-sensitive receptors were compared to limits of the measured daytime noise level plus five decibels and the measured nighttime noise level plus five decibels.

3. Project Site

The Project is located in Clinton County, Ohio. Figure 3-1 shows the Project site, including the locations of the solar panels and inverters, the substation, and the Project boundary. The site is bordered to the north by Mud Switch Road, to the south by Turner Road, to the east by Route 134, and to the west by Chaney Road. Figure 3-1 also shows the location of the 264 noise-sensitive receptors identified within approximately one-half mile of the Project. The noise-sensitive receptors include 254 non-participating residences, one non-participating church, and nine participating residences. The land use immediately surrounding the Project is a mix of agricultural and rural residential. Noise levels at receptors located beyond one-half mile will be less than those reported herein.

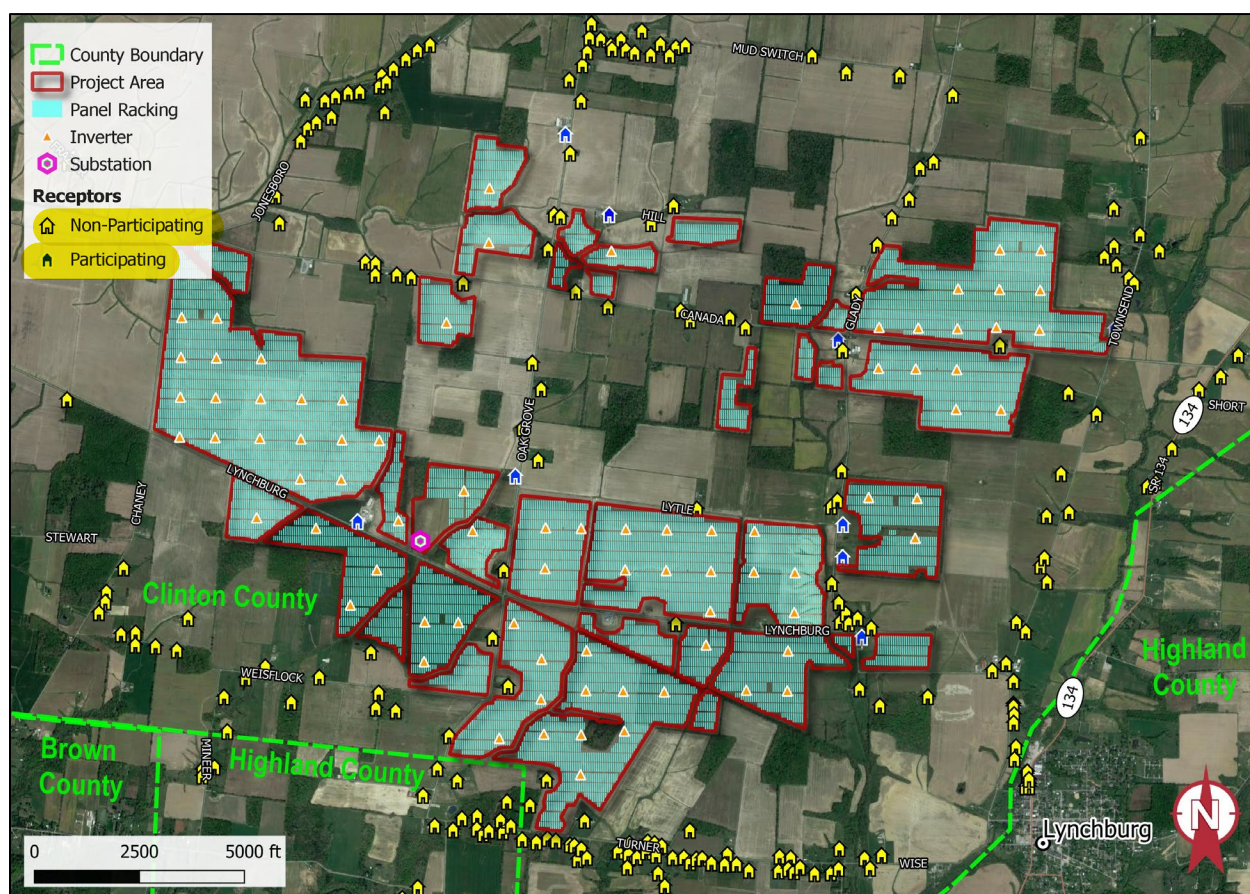


Figure 3-1. Proposed Yellow Wood Solar Energy Center Layout

4. Pre-Construction Background Noise Study

A pre-construction background sound (noise) level survey was conducted in the Project area in September 2020. The purposes of the survey were to measure and document existing sound levels, assess the character of the existing sound environment, and provide data for use in determining the applicable noise limit for the Project.

Measurement Locations

The Project area includes open farmland, farmsteads, rolling hills, forested areas, paved rural and higher speed county roads, and one state highway. Sources of existing sound include natural sources such as wind, birds, and insects, as well as man-made sources such as traffic, farming equipment, and aircraft overflights. Noise levels were measured continuously at four locations (designated herein as long-term (LT)) and periodically at four other locations (designated herein as short-term (ST)). Selection of monitoring locations considered several factors, including proximity to the proposed Project, proximity to roadways, farm and non-farm settings and their local activities and sources, and equipment security. A goal of the site selection process was to achieve a relatively even geographical distribution of measurement locations across the Project area. Refer to Figure 4-1 for detail on the measurement locations. Photographs of each long-term and short-term measurement location are shown in Appendix A.

LT1 is located at a residence in the northeast portion of the Project area approximately two miles north of Lynchburg. Specifically, measurements were taken approximately 70 feet west of Townsend Road. This area contains scattered residential properties, farmlands, and some forested areas. The immediate area around the measurement location is exposed with minimal trees. Wind speed and direction were measured at this location.

LT2 is located at a residence in the southeast portion of the Project area approximately one mile northwest of Lynchburg. Specifically, measurements were taken approximately 130 feet east of Lynchburg Road. The site is surrounded by farmlands and a cluster of residences directly to the north. Lynchburg Road is a low-volume connector road primarily utilized by local residents and farm equipment. Meteorological measurements at this location included wind speed, wind direction, temperature, relative humidity, and precipitation.

LT3 is located at a future residence in the central portion of the Project area approximately 100 feet west of Oak Grove Road. Scattered residences are located to the north and south. This location has moderate exposure to local traffic and is located near a large agricultural operation roughly one-half mile to the southwest. Wind speed and direction were measured at this location.

LT4 is located at a residence in the north-central portion of the Project area approximately 200 feet south of Canada Road and 270 feet west of Gladys Road. This location was selected because it was centrally located in the Project and away from higher levels of traffic noise found in the eastern and western regions of the Project area. Wind speed and direction were measured at this location.

ST1 is located northeast of the Project. This area was selected to represent residences along Townsend Road near the Project boundary. Land use in the area includes a mix of farming and residences. This site is exposed (not near any trees) and on flat terrain.

ST2 is located in the south-central portion of the Project at the intersection of Weisflock Road and Oak Grove Road. This site was selected for its general southern location. Land use in the area consists of farming and residences. Similar to ST1, there are no trees near this site.

ST3 is located near the western boundary of the Project area at the intersection of Jonesboro Road and Canada Road. This site was selected for its general western location. The primary land use in the area is farmland, with some forested areas.

ST4 is located in the north-central portion of the Project at the intersection of Oak Grove Road and Hill Road. This area was selected for its general northern location. The primary land use in the area is farmland with some residences along Oak Grove Road.

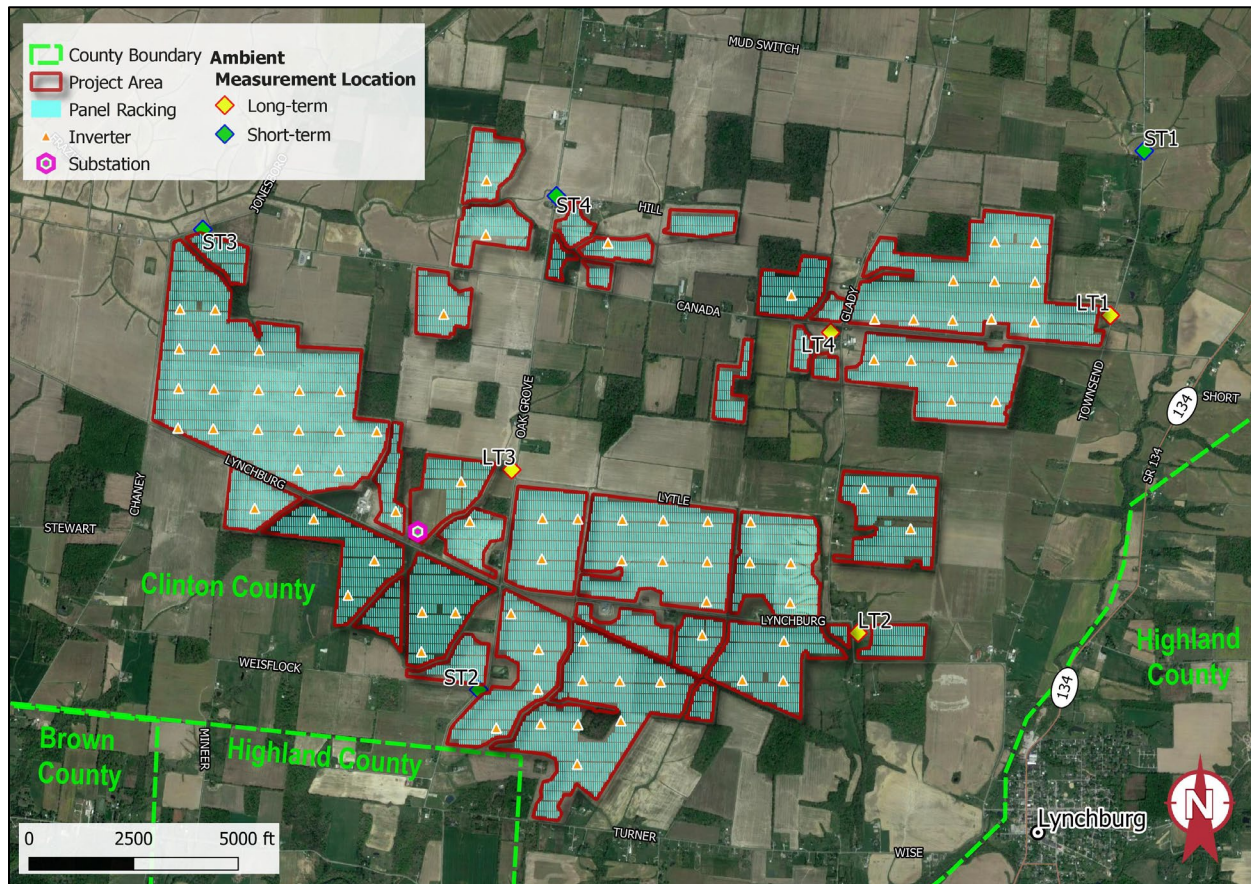


Figure 4-1. Background (Ambient) Noise Measurement Locations

Measurement Duration

Data were collected at the long-term sites for approximately two weeks (September 8 through September 21, 2020). Ten-minute measurements were conducted at each short-term site during the early morning and evening hours on two occasions between September 7 and 9, 2020. A total of 16 short-term measurements were made, four at each short-term site.

Measurement Equipment

Table 4-1 lists the instruments that were employed for the ambient sound survey. The acoustic instruments meet the Type 1 provisions of IEC 61672-1 Class 1, ANSI S1.4 Type 1, and/or ANSI S1.43. Specifications for the sound level monitors indicate ranges of ambient conditions from -10°C to +50°C temperature and 10% to 90% relative humidity (non-condensing), and a measurement range of 25 dBA to 138 dBA with an inherent noise floor of 18 dBA.

The sound level monitors were field calibrated just prior to and directly following each series of measurements. The drift in the measured noise level was minimal (-0.1 to +0.2 dB) over the measurement period and within accepted limits (± 0.5 dB per ANSI S12.9). In addition, the instruments were calibrated by an accredited laboratory within the 18 months prior to their use. Each microphone was covered with hydrophobically-treated seven-inch diameter 80 pores-per-inch density windscreens (ACO Pacific model WS7-80T) to reduce the potential influence of wind-induced noise. The microphones were mounted on a tripod and positioned five feet above the ground per ANSI S12.9 and at least 25 feet away from acoustically reflective surfaces.

Wind speed was measured at each long-term measurement location using either a Vaisala WXT536 or WMT52 sensor mounted at an elevation of six feet above the ground. The vendor specifications for the wind data logging system include: accuracies of $\pm 2\%$ from 0 to 10 mph and $\pm 2.5\%$ for 10 to 100 mph; and environmental conditions of -60°F to +140°F and 0% to 100% relative humidity. Wind speeds were measured at the short-term locations using a Kestrel 3000 anemometer.

Table 4-1. Noise and Meteorological Measurement Equipment

Measurement Location	Sound Level Monitor	Frequency Range (Hz)	Noise Floor (dBA)	Anemometer
LT1	Larson Davis 831	6.3 - 20k	18	Vaisala WMT52
LT2	Larson Davis 831	6.3 - 20k	18	Vaisala WXT536
LT3	Larson Davis 831C	6.3 - 20k	18	Vaisala WMT52
LT4	Larson Davis 831C	6.3 - 20k	18	Vaisala WMT52
ST1 - ST4	Larson Davis 831	6.3 - 20k	18	Kestrel 3000

Measurement Parameters

The sound level meters were configured to continuously measure and record both the 10-second and 10-minute averages of the overall L_{eq} and L_{90} , as well as one-third octave band L_{eq} and L_{90} levels (6.3 Hz to 20 kHz). One-third octave band levels were used to re-calculate ANS-weighted

overall levels using the procedures outlined in ANSI S12.100. The ANS-weighting removes excess high frequency biogenic noise that would not be present in colder times of the year.

Short-term Measurement Results

Table 4-2 lists the results of the short-term (attended) measurements. Shown are the L_{eq} and L_{90} levels measured at each site, as well as the sources of noise. Daytime ANS-weighted ambient noise levels, taken between approximately 7:00 and 9:00 a.m., ranged from 44 to 58 dBAi (L_{eq}) and 23 to 47 dBAi (L_{90}). Evening ANS-weighted ambient noise levels, taken between approximately 3:00 and 5:00 p.m., ranged from 44 to 58 dBAi (L_{eq}) and 19 to 43 dBAi (L_{90}).

Table 4-2. Short-Term Noise Measurement Results

Location	Measurement	L_{eq} - 10min (dBAi)	L_{90} - 10min (dBAi)	Audible Sounds
ST1	Day, Sept 8	58	24	local traffic, planes overhead, insects, birds, voices/conversation to S/SW
	Day, Sept 9	44	39	planes overhead, insects, birds, farming/mechanical noise to east, dog barking
	Evening, Sept 7	54	35	farm equipment to the west, insects, wind, local traffic, plane overhead
	Evening, Sept 8	58	34	mechanical noise to NW, voices/conversation to S/SW, insects, birds, traffic
ST2	Day, Sept 8	49	23	insects, local traffic, birds, distant train horns
	Day, Sept 9	45	41	insects, birds, distant and local traffic, planes overhead
	Evening, Sept 7	55	32	distant traffic, insects, breezy, local traffic, distant mechanical/farming noise
	Evening, Sept 8	44	31	local traffic, insects, calm winds
ST3	Day, Sept 8	52	29	wind, insects, birds, distant and local traffic, planes overhead
	Day, Sept 9	57	47	insects, birds, local and distant traffic, dog barking to the east, distant mechanical noise, calm winds
	Evening, Sept 7	51	43	wind dominant, gusts over 5 m/s, wind speeds 3-5 m/s, some insect noise, almost all wind
	Evening, Sept 8	54	19	insects, birds, planes overhead, local traffic, breezy
ST4	Day, Sept 8	44	23	birds, insects, distant and local traffic, distant train horns, plane overhead, winds calm
	Day, Sept 9	45	44	birds, roosters, insects, fan hum/whine to the east, distant traffic, winds calm
	Evening, Sept 7	45	30	insects, wind, wind through trees dominant, distant mechanical noise, local traffic
	Evening, Sept 8	48	20	insects, birds, distant mechanical noise, calm winds

Long-Term Measurement Results

Noise levels were measured continuously and unattended for approximately two weeks. Figure 4-2 shows a representative plot of one week of noise and wind speed data at LT1. Plots of all measured data at each site are provided in Appendix D. Note that while 10-minute L_{eq} samples were used to calculate overall ambient levels, figures in Appendix D plot one-hour L_{eq} noise levels for a cleaner visual representation. The data were analyzed as follows:

- Data samples were excluded for periods of rain as indicated in the plots provided in Appendix D.
- Data samples were excluded for periods when the measured ground wind speed exceeded 5 m/s.
- Data samples contaminated by anomalies such as levels greater than 70 dB were excluded as these are indicative of transient noise events.
- The effect of biogenic noise (insects, birds, frogs) was minimized by removing the 2,000 to 8,000 Hertz octave band levels (these frequencies are where biogenic noise presents itself) and recalculating the overall ANS-weighted noise level (dBAi) per ANSI S12.1.
- One-third octave band noise level data were analyzed according to ANSI S12.9-2005 Part 4 – Annex C *Sounds with Tonal Content*. No consistent man-made tonal sources were observed. Brief periods recognizable as machinery at LT2 (farming activity) were recorded, but were not extensive enough to influence long-term average noise levels.
- The data were divided into daytime (7:00 am to 10:00 pm) and nighttime (10:00 pm to 7:00 am) periods.
- For each site the remaining noise level samples were used to determine the range and average L_{eq} . The results are listed in Table 4-3. Average levels were determined as the arithmetic average of all valid 10-minute samples after filtering. The average site-wide ambient noise levels are 42 dBAi during the daytime and 33 dBAi during the nighttime.

Table 4-3. Summary of 10-minute Noise Levels from Long-Term Monitoring (dBAi)

Monitor	Time	L ₁₀ Avg	L ₁₀ Min	L ₁₀ Max	L ₅₀ Avg	L ₅₀ Min	L ₅₀ Max	L ₉₀ Avg	L ₉₀ Min	L ₉₀ Max	L _{eq} Avg	L _{eq} Min	L _{eq} Max
LT1	Day	42	25	69	34	18	54	29	15	45	46	23	65
LT2	Day	42	25	72	33	21	60	28	19	58	41	24	67
LT3	Day	41	20	71	32	16	65	27	14	61	43	18	68
LT4	Day	39	21	66	30	18	61	26	14	58	37	19	62
Average		41	23	69	32	18	60	28	15	56	42	21	66
LT1	Night	35	16	55	25	12	42	20	10	35	38	18	54
LT2	Night	33	21	50	27	19	38	24	17	33	32	20	50
LT3	Night	32	18	52	25	13	42	21	11	38	32	18	52
LT4	Night	30	16	53	23	13	36	19	11	31	29	18	51
Average		33	18	53	25	14	39	21	13	34	33	19	52

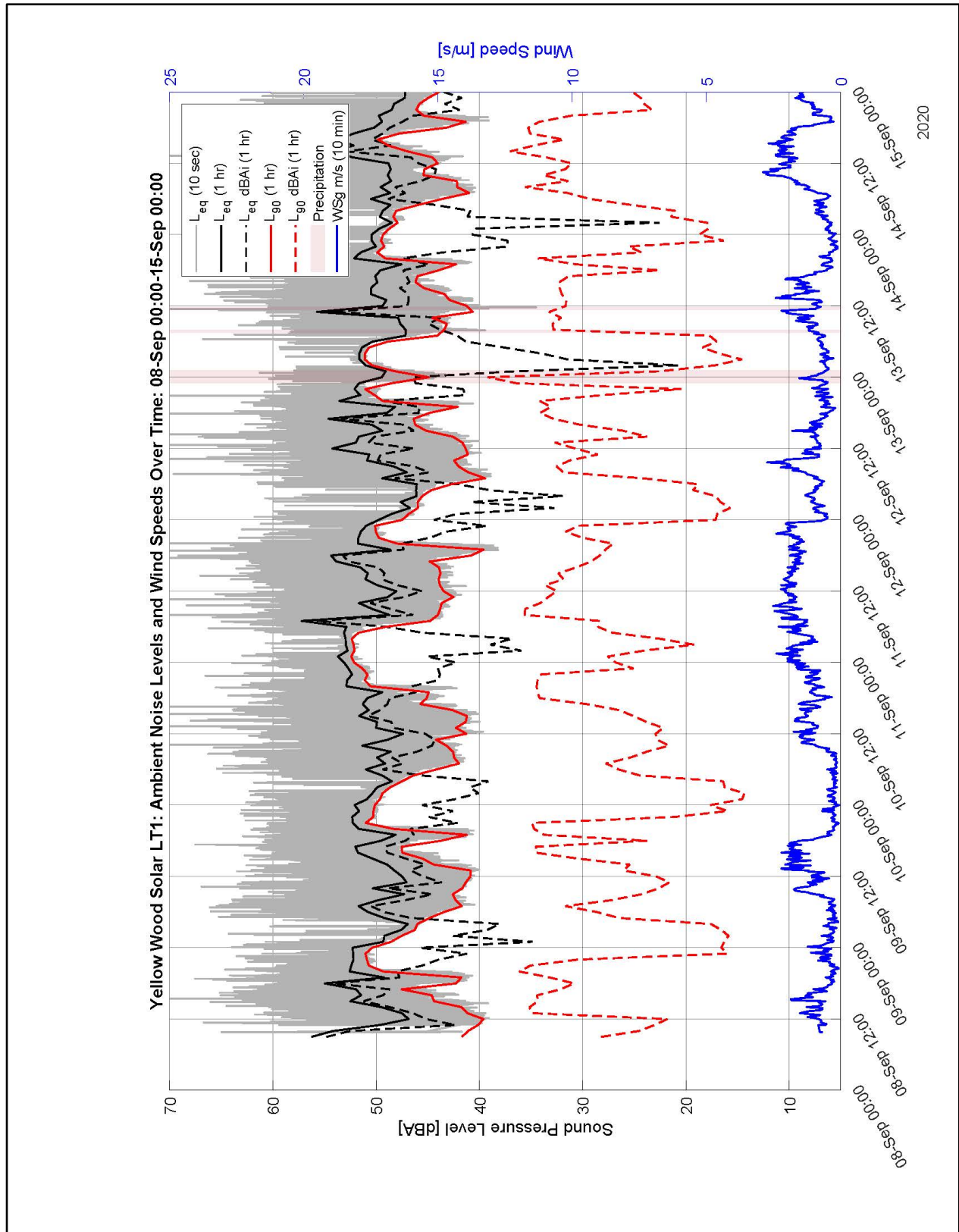


Figure 4-2. Measured Background Noise Levels at Location LT1 (September 8 – 15, 2020)

5. Noise Modeling Methods

Noise levels from the operation of the proposed Project were predicted using the International Organization for Standardization (ISO) Standard 9613-2:1996, *Attenuation of Sound During Propagation Outdoors - Part 2: General method of calculation*. The calculations were implemented using the SoundPLAN v8.2 acoustical modeling software program. There are a number of parameters in the ISO 9613-2:1996 method, including the locations of the noise sources and receivers, noise source spectral characteristics, terrain and ground type, and atmospheric propagation conditions. The ISO method assumes optimal acoustic propagation in all directions, specifically that a “well-developed, moderate ground-based temperature inversion” is present or, equivalently, that all receptors are downwind of all noise sources at all times. The sections below describe the specific ISO 9613-2:1996 settings used in this analysis to predict noise from operations.

Terrain and Ground Effect

The terrain in the acoustic model was defined using Digital Elevation Model (DEM) data from the U.S. Geological Survey (USGS) National Elevation Dataset. The acoustical effect of the ground was modeled using the ISO 9613-2:1996 General Method. This method requires the selection of ground factors for the ground near the source, near the receiver, and in between. A ground factor of 0.0 represents a completely reflective surface such as pavement, which would result in a higher level of sound reaching a receiver. A ground factor of 1.0 represents absorptive ground such as thick grass or fresh snow, resulting in a lower level of sound reaching a receiver. Modeling for this Project used a ground factor of 0.5 because the site will be planted with native grasses after construction.

Atmospheric Conditions

The air temperature, relative humidity, and atmospheric pressure were set to standard-day conditions of 10°C, 70%, and 1 atmosphere, respectively. Per ISO 9613-2:1996, these values result in the least amount of atmospheric sound absorption and the highest levels of sound reaching the receivers.

Receptors

In the SoundPLAN model, prediction points (receptors) were located at the 264 noise-sensitive receptors within approximately one-half mile of the Project boundary. Of these receptors, 254 are non-participating residences, one is a non-participating church, and nine are participating residences. Prediction locations are shown in Figures 5-1 to 5-3. In accordance with ISO 9613-2:1996, the height above the ground for each receptor was set to five feet.

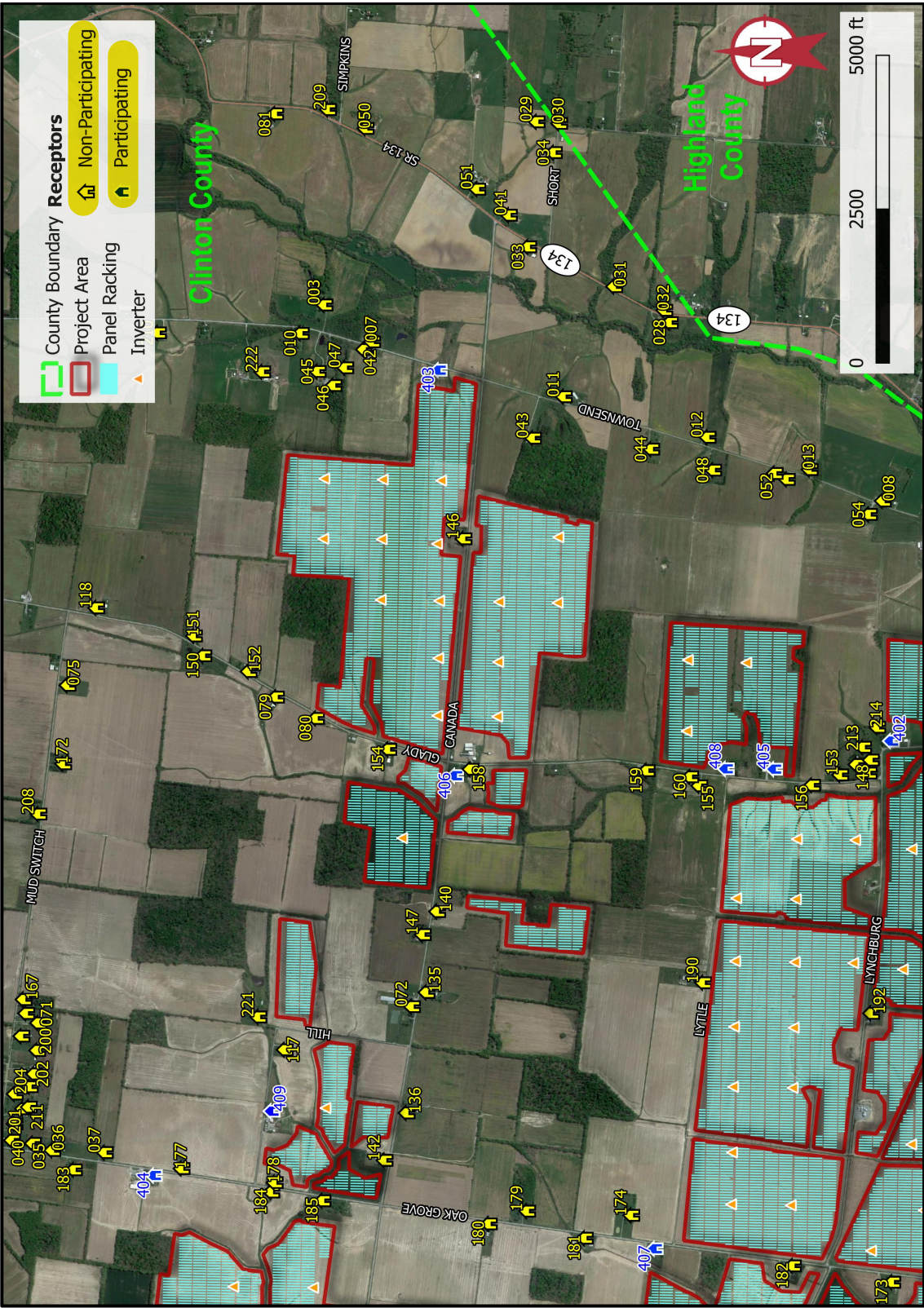


Figure 5-1. Noise-Sensitive Receptors – Northern Area

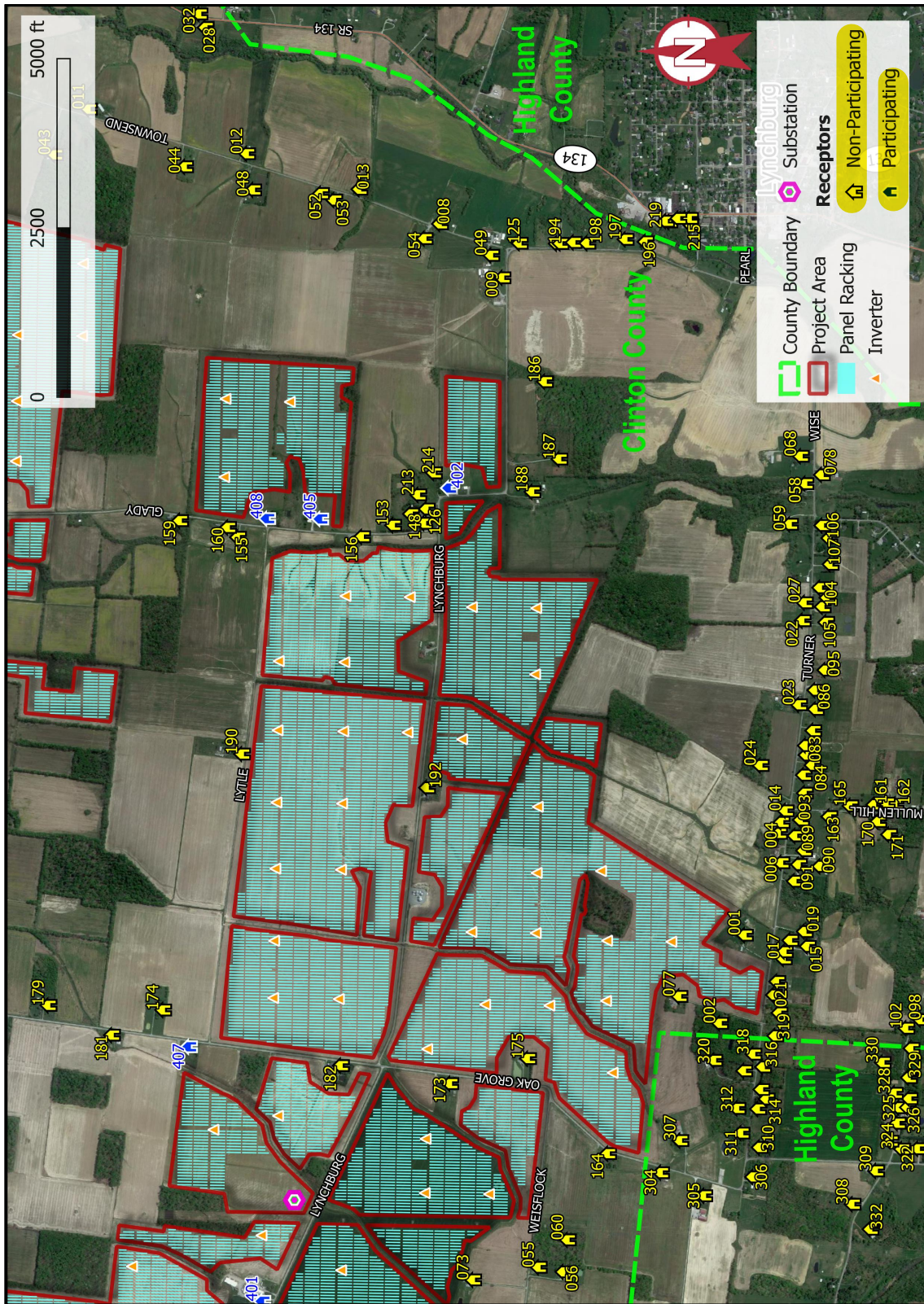


Figure 5-2. Noise-Sensitive Receptors – Southern Area

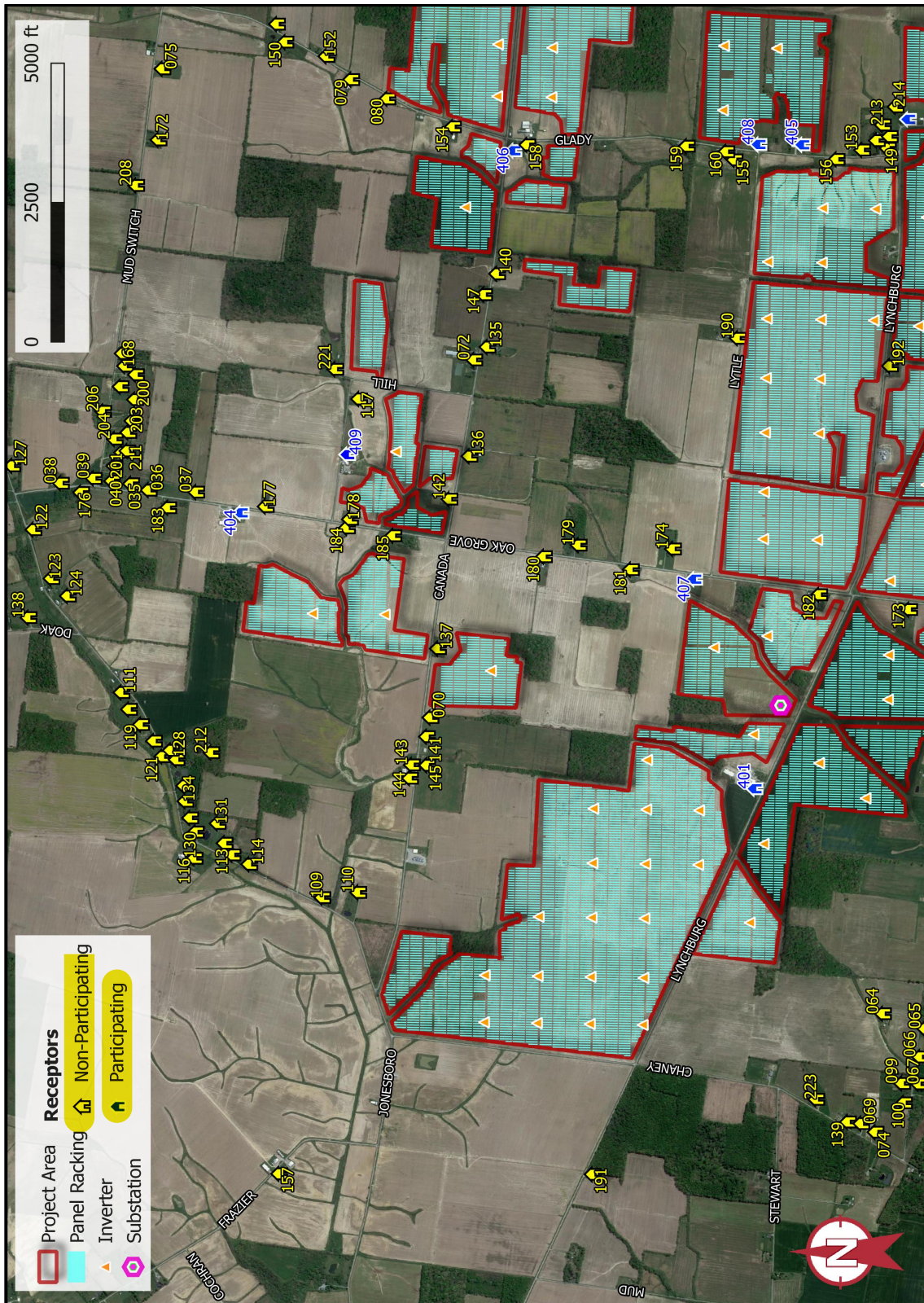


Figure 5-3. Noise-Sensitive Receptors – Western Area

Construction Noise Sources

Noise levels were predicted using the Federal Highway Administration's (FHWA) Roadway Construction Noise Model v1.1 for the five phases of construction: site preparation, civil work, pile driving, mechanical assembly, and electrical work. Table 5-1 lists the equipment associated with each phase, as well as the number of units to be employed, the sound power level of each unit, and the percentage of time that each piece of equipment is expected to be used at full capacity (the usage factor). Construction noise source levels were generally based on measurements of construction equipment made by Hankard Environmental on previous projects. The usage factors were taken from the RCNM. All construction noise sources were modeled at 10 feet above the ground.

Table 5-1. Noise Source Characteristics of Construction Equipment

Phase	Equipment Type (quantity)	Usage Factor (%)	Octave Band Sound Power Level (dB)									Overall Sound Power Level (dBA)
			31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1,000 Hz	2,000 Hz	4,000 Hz	8,000 Hz	
1 Site Preparation	Bulldozer (1)	40%	116	111	116	116	105	107	104	95	85	112
	Excavator (2)	40%	103	112	112	107	99	97	95	92	85	104
	Motor Grader (2)	40%	100	99	110	104	101	110	103	94	89	112
	Water Truck (1)	40%	103	107	112	103	106	104	98	94	85	108
	Dump Truck (1)	40%	98	112	105	103	97	98	96	90	82	103
2 Civil Work	Roller (1)	40%	--	138	128	115	101	98	97	94	90	116
	Dump Truck (1)	40%	98	112	105	103	97	98	96	90	82	103
	Excavator (2)	40%	103	112	112	107	99	97	95	92	85	104
	Trencher (1)	50%	109	114	114	108	105	102	101	95	87	108
	Motor Grader (2)	40%	100	99	110	104	101	110	103	94	89	112
	Water Truck (1)	40%	103	107	112	103	106	104	98	94	85	108
3 Pile Driving	Pile Driving (1)	20%	128	130	132	121	125	126	124	119	111	130
	Pickup Truck (2)	40%	100	114	107	105	99	101	98	92	84	105
	Man Lift (2)	20%	102	108	101	92	92	93	94	87	81	99
	Crane (1)	16%	--	139	117	104	102	100	96	90	85	114
	Backhoe/Loader (1)	40%	105	102	111	101	99	101	99	96	91	106
4 Mechanical Assembly	Pickup Truck (2)	40%	100	114	107	105	99	101	98	92	84	105
	Man Lift (2)	20%	102	108	101	92	92	93	94	87	81	99
	Crane (1)	16%	--	139	117	104	102	100	96	90	85	114
	Backhoe/Loader (1)	40%	105	102	111	101	99	101	99	96	91	106
5 Electrical Work	Pickup Truck (2)	40%	100	114	107	105	99	101	98	92	84	105
	Flatbed Truck (1)	40%	100	114	107	105	99	101	98	92	84	105
	Man Lift (1)	20%	102	108	101	92	92	93	94	87	81	99
	Small Generator (1)	50%	103	110	108	108	105	104	103	102	98	110
	Compressor (1)	40%	106	113	111	111	108	107	106	105	101	113

Operational Noise Sources

The model of noise emissions from the Project included 81 inverters and two primary step-up transformers located at the Facility's substation. Note that noise from solar tracking motors was not included as it has been found to be inaudible off-site based on measurements made at existing solar facilities. The inverters were modeled at a height of six feet above ground. The substation step-up transformers were modeled at a height of ten feet above ground. The inverters and substation step-up transformers were all assumed to operate at full acoustic output during the daytime. Only the step-up transformers were assumed to operate at night (at full acoustic output).

Table 5-2 lists the sound power levels for each source. The Project proposes to use the TMEIC Ninja 4.2 kW model inverter or a similar substitute. The solar inverter levels shown in the table are based on field measurements of a TMEIC 4.2 kW model in operation at an existing solar farm. The sound power level of the step-up transformers was estimated using the procedures outlined in the "Electric Power Plant Environmental Noise Guide" from the Edison Electric Institute (EEL, 1984).

Table 5-2. Noise Emission Levels of Operational Equipment

Equipment Type	Equipment Quantity	Octave Band Sound Power Level (dB)									Overall Sound Power Level (dBA)
		31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1,000 Hz	2,000 Hz	4,000 Hz	8,000 Hz	
Solar Inverter	81	105	98	95	94	95	88	83	78	76	95
Transformer (178 MVA)	2	97	103	105	100	100	94	89	84	77	100

6. Predicted Construction Noise Levels

The construction noise analysis was conducted using the FHWA's Roadway Construction Noise Model (RCNM) v1.1. This computer software program includes construction noise source sound pressure levels and equipment usage factors. Noise levels from each of the five phases of construction of the Facility were predicted at each of the receptor locations identified within the Project Study Area and at one worst-case location along the Project boundary. These phases include site preparation (clearing); civil work (grading and the construction of access roads); pile driving (use of small specialty pile driving units); mechanical assembly of the solar panels, racks, and modules; and electrical work, which consists of connecting all the equipment. Some of this work will be conducted concurrently in different areas of the site. The total duration of construction is approximately 18 months.

The ranges of predicted construction noise levels ($L_{eq(1hr)}$) for each phase of construction at all of the receptors are provided in Table 6-1. For pile driving, the expected worst-case maximum levels (L_{max}) are presented because this activity can be the most noticeable when nearby, even though this source may not be operating continuously. These values assume that all of the equipment for each phase of work is operating at its expected hourly usage-factor. Predicted construction noise levels for all of the receptor and project boundary locations are provided in Appendix B.

Table 6-1. Predicted Construction Noise Levels at Receptors

Construction Phase	Range of Noise Levels (L_{eq-1hr} (dBA))	
	Minimum	Maximum
1 – Site Preparation	44	75
2 – Civil Work	44	75
3 – Pile driving	55 ⁽¹⁾	82 ⁽¹⁾
4 – Mechanical Assembly	38	69
5 – Electrical Work	37	68

⁽¹⁾ Maximum instantaneous noise level shown

Mitigation measures for construction noise, if necessary, include the use of ambient controlled broadband backup alarms versus tonal alarms, using well-maintained equipment (particularly with respect to mufflers), and maintaining communication with affected residents.

7. Predicted Operational Noise Levels

The primary noise sources associated with the operation of the Project include 81 pad-mounted inverters located throughout the Project area and the two 178 MVA step-up transformers located at the substation. This analysis assumed that all of the equipment would operate simultaneously at full acoustic output during the daytime, but only the substation step-up transformers would operate at night (at full acoustic output). Operational noise levels were predicted at the 254 non-participating residences, one non-participating church, and nine participating residences, which are all within approximately one-half mile of the Project boundary. Noise levels at more distant receptors will be less than those described herein.

The noise levels predicted from daytime and nighttime operation of the Facility are depicted graphically in Figures 7-1 and 7-2, respectively. Shown are the 47 dBA and 38 dBA noise level contours which represent the daytime and nighttime noise level limits, respectively. The overall range of predicted daytime noise levels, including participating and non-participating residences, is 22 to 44 dBA, with 97% of the residences having levels of 40 dBA or less. All of the levels are less than the daytime limit of 47 dBA. The loudest level of 44 dBA is predicted at a non-participating residence (R146) on Canada Road in the northeastern portion of the Project area. There are five other non-participating residences scattered about the Project area with predicted levels from 41 to 42 dBA, before getting down to 40 dBA or less for the vast majority of all residences. The loudest level for participating residences (R401) of 43 dBA is on Lynchburg Road in the western portion of the Project.

The overall range of predicted nighttime noise levels for non-participating residences, is < 10 to 35 dBA, all of which are below the limit of 38 dBA established for the Project. At participating residences, the loudest predicted nighttime noise levels are 38 dBA (R401) and 32 dBA (R407), with the levels at remaining locations being 18 dBA or less.

Along the Project boundary, the predicted worst-case operational noise levels could exceed 47 dBA, but only in areas adjacent to agricultural or undeveloped land uses which are not considered noise-sensitive.

See Appendix C for a list of predicted daytime and nighttime operational noise levels at all residences.

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Summary: Response to First Data Request from Staff of the Ohio Power Siting Board (Part 1 of 3) electronically filed by Christine M.T. Pirik on behalf of Yellow Wood Solar Energy LLC