



Linn County Research Request #3

For the Good Neighbor Practices Committee and the Balancing Agriculture and Solar Committee. Research completed by Rachel Percy and Sydne Tursky from Great Plains Institute.

QUESTION #1 - SOUND REQUIREMENTS

Please provide example ordinances that place sound restrictions on utility-scale solar projects. If possible try and find ordinance that include performance testing (such as testing the noise level at the property line for adherence to requirements following construction). Aim for 3-4 examples.

Examples

Adams County, IL

[Adams County Code Ordinance § 5-7-3\(i\)](#)

“(i) Noise – Noise levels measured at the property line shall not exceed fifty (50) decibels when located adjacent to an existing residence.”

Also: Carroll County, IL; Mills County, IA; Jersey County, IL; Kankakee County, IL; Livingston County, IL

Champaign County, IL

[Champaign County Zoning Ord. 6.1.5\(l\)](#)

“1. Standard Conditions for Allowable Noise Level

(1) Noise levels from any PV SOLAR FARM shall be in compliance with the applicable Illinois Pollution Control Board (IPCB) regulations (35 Illinois Administrative Code Subtitle H: Noise Parts 900, 901, 910).

(2) The Applicant shall submit manufacturer’s sound power level characteristics and other relevant data regarding noise characteristics of proposed PV SOLAR FARM equipment necessary for a competent noise analysis.

(3) The Applicant, through the use of a qualified professional, as part of the siting approval application process, shall appropriately demonstrate compliance with the above noise requirements as follows:

a. The SPECIAL USE permit application for other than a COMMUNITY PV SOLAR FARM shall include a noise analysis that includes the following:

(a) The pre-development 24-hour ambient background sound level shall be identified at representative locations near the site of the proposed PV SOLAR FARM.

(b) Computer modeling shall be used to generate the anticipated sound level resulting from the operation of the proposed PV SOLAR FARM within 1,500 feet of the proposed PV SOLAR FARM.

(c) Results of the ambient background sound level monitoring and the modeling of anticipated sound levels shall be clearly stated in the application and the application shall include a map of the modeled noise contours within 1,500 feet of the proposed PV SOLAR FARM.

(d) The application shall also clearly state the assumptions of the computer model's construction and algorithms so that a competent and objective third party can as simply as possible verify the anticipated sound data and sound levels."

DeKalb County, IN

[DeKalb County Solar Energy Systems Ordinance](#)

"Noise Generating Equipment Setback: All Equipment shall meet the minimum underlying Zoning District setbacks for primary structures. Equipment that could create objectionable sounds during normal operations shall be located as far as practically possible away from any non-participating existing dwelling. Unless otherwise allowed by IC 36-7-4-1109, a project owner may not install or locate a CSES unless the project owner demonstrates to the Zoning Administrator that the CSES will operate so the sound attributed with the CSES will not exceed an hourly average sound level of fifty (50) A-Weighted decibels, as modeled at the outer wall of an existing dwelling located on an adjacent nonparticipating property or no less than 150 feet from any nonparticipating property line that does not include a residence. The requirement set forth in this section may be waived with respect to any one (1) CSES, subject to written notarized consent of the owner(s) of each adjacent nonparticipating property."

Dearborn County, IN

[Dearborn County Ordinance Art. 19](#)

"The Applicant shall submit a Noise Evaluation Report for each grouping of solar panels and any substation or facility that emits noise in the project. The report shall state, at minimum, the daytime and nighttime base-line noise level at a point on the property line closest to the primary dwelling on an adjoining non-participating parcel; the potential noise level

generated by the solar panels and inverters and any substation associated with the project; and the manufacturer's technical documentation of the proposed solar energy generating equipment noise levels. The Noise Evaluation Report shall include the projected maximum levels of infrasonic sound, ultrasonic sound, impulsive noise and prominent discrete tones generated and measured at a point on the property line closest to the primary dwelling on an adjoining nonparticipating parcel. The report shall include a map depicting the noise study area radius, project boundaries, sound level monitoring locations and the nearest receptor locations. The Noise Evaluation Report shall include any potential mitigation measures to minimize sound levels above 40 decibels and 55 decibels—the former of which is considered an accepted noise level in a quiet rural setting and the latter of which is considered an accepted noise level in a quiet urban area—at the aforementioned property line point(s).”

Hamilton County, IL

[Hamilton County Ord. 01-2021\(F\)\(1\)\(f\)](#)

“No operating C-SES shall produce noise that exceeds any of the following limitations except during construction. Adequate setbacks, barriers, enclosures, use of quieter equipment, or other effective means of reducing noise shall be used to comply with these limitations:

- ii. Fifty (50) dBA, as measured at the property line of any adjacent residentially zoned lot.
- iii. Forty-five (45) dBA, as measured at any existing adjacent residence between the hours of nine p.m. and seven a.m.; and
- iv. Sixty (60) dBA, as measured at the property lines of the project boundary, unless the owner of the affected property agrees to a higher noise level, as follows: The owner of an adjacent property that would otherwise be protected by the sixty dBA noise limitations may voluntarily agree, by written waiver, to a higher noise level. Any such agreement must specifically state the noise standard being modified, the extent of the modification, and be in the form of a legally binding contract or easement between the landowner (including assignees in interest) and the solar energy system developer, effective for the life of the project. This waiver must be recorded and cross-referenced with the affected property (properties).
- v. The Executive Director may hire an appropriate company, at the C-SES’s owner or C-SES’s operator’s expense, to determine if noise levels have been exceeded.

Chisago County, MN

[Chisago Land Use Ord. § 7.31\(F\)](#)

“Noise – Construction and routine maintenance activities shall be limited to daytime working hours, as defined in Minn. R. 7030.0020, to ensure nighttime noise level standards will not be exceeded. The following additional noise related site standards shall also be satisfied: 1) Placement of transformers, inverters, or other equipment generating ongoing vibration or noise must be done in such a manner that low level recurring ambient noise does not audibly cross property boundaries. Placement of equipment interior to the site, shielded by proposed solar panels, and/or shielded by specifically placed noise and vibration deadening fence, landscape, berm, or other efforts, shall be required for all commercial solar sites in close proximity to existing developed homes or property boundaries. 2) The piling installation construction phase of every project generates repetitive audible noise and is extremely disruptive. Piling installation timelines and durations shall be identified in the application and consolidated into the shortest most confined time period possible. Installation of pilings shall take place only during permittee identified daytime and weekday hours which may be further limited by permit conditions if in close proximity to existing residences. Piling installation shall cease on Sundays and be limited between the hours of 7 a.m. – 6 p.m. on Saturdays.”

Iroquois County, IL § 2(A)(b)(8)

[Iroquois County Solar Ord. § 2\(A\)\(b\)\(5\)](#)

“Noise levels measured at the property line shall not exceed 35 db(A) from 7am to 10pm and 30 db(A) from 10pm to 7am when located adjacent to an existing residence or residential district while the solar unit is in production. This noise restriction pertains to permanently installed solar solar equipment and excludes routine maintenance repair and initial construction”

DeWitt County, IL

[DeWitt County Code § 137.08\(A\)13](#)

“13. Noise levels measured at the property line shall not exceed 40 db(A) Lmax from 10pm to 7am, 42 db(A) Lmax from 7am to 10pm, or the Illinois Pollution Control Board standards, whichever is less, when located next to a residence or residential district.”

QUESTION #2 – VIEWSHED STUDIES & LANDSCAPE PLANS

Please provide example ordinances that use viewshed studies (such as this one: [View-Shed-and-Photo-Simulation-Assessment \(linncountyiowa.gov\)](#)) to specify landscaping/screening requirements. This does not have to be specifically for utility-scale solar projects. The group is looking for any example of using these types of quantitative studies to formulate screening requirements. Aim for 1-2 examples.

Research Note

Examples of ordinances that use viewshed studies for solar development are few and far between, especially among the group of ordinances originally surveyed for this research. All solar ordinances from the originally surveyed states (MN, IL, IA, IN, WI) that mentioned viewshed studies or visual impact studies are listed here, though only one, from Posey County, IN, came close to matching the request. To fully address the request, a more substantial solar ordinance (Claremont, NH) that uses a viewshed study to address screening is included.

Examples

Claremont, NH

[City of Claremont Solar Ordinance](#)

Claremont requires a viewshed study and references protecting viewsheds at many points in its ordinance, including in regards to screening. See link for more details.

Posey County, IN

[Posey County Zoning § 153.124.02F](#)

“VISUAL IMPACT EVALUATION REPORT: The Applicant shall submit a Visual Impact Evaluation Report evaluating the visual impact of all solar panels on properties within certain distances of the project. The report shall assess the visual impact on all properties within the visual impact zones identified below. The following shall be included in the Visual Impact Evaluation Report:

1. a map depicting the dimensions of the proposed site, names and addresses of adjoining property owners not participating in the project that clearly identifies the setbacks distance in feet from each of the each proposed Distal Solar Panel and adjoining property lines, the site of each of the photographic simulations taken in the View Shed Area, town and city boundaries, historic sites/districts, state and local designated scenic areas and roads, recreational areas, open space and conservation areas, schools, parks, water resources, military installations, airports or landing strips, cell towers, weather and radar stations

2. detailed description of the potential visibility of each Distal Solar Panel and the methodology used evaluate visibility within the following View Shed Areas and maps of the applicable View Shed Area identifying town and city boundaries, historic sites/districts, state and local designated scenic areas and roads, recreational areas, open space and conservation areas, schools, parks, water resources, military installations, airports or landing strips, cell towers, weather and radar stations
3. View Shed Areas Defined: ½ mile radius from each Distal Solar Panel adjacent to the project boundary
4. Photographic simulations of the View Shed Area in sufficient number to capture the general visibility of Distal Solar Panels and a map depicting the location for each photographic simulation
5. Any mitigation measures proposed to minimize the visual impact of the project”

Noble County, IN

[Noble County Zoning Ordinance](#)

“13. Visual Buffer: A Berm, natural vegetation or evergreen plants to provide a reasonable visual buffer for non-participating preexisting dwelling(s), to cover the minimum required radius for the entire viewshed, meet the vision clearance standards, included in the Development Plan, Section 23.

A. Installation: Buffer may include more than one buffer material with a clear intent to buffer CSES.

B. Requirement: At the onset of CSES installation the project owner shall install a natural landscape buffer, subject to approval by the Development Plan Committee, Section 23.

C. Screening: The buffer must meet a minimum of 6’ in height at the time of installation, located between the property line and CSES fence on the participating landowner property.

1) Natural Disaster: In the event of a natural disaster or natural loss of the installed or pre-existing buffer, replacement of the buffer shall be completed within no more than 1 year from the date of the event.

a. A one (1) time extension may be requested. The request must be submitted in writing and received by the Zoning Administrator prior to 1-year post event. The additional allowance not to exceed six (6) months, subject to approval.

b. Additional extension: no less than 14 days prior to the next available Plan Commission meeting, a written request for an additional six (6)

month extension must be received by the Zoning Administrator for Plan Commission member decision.”

Clearwater County, MN

[Clearwater County Renewable Energy Ord. § 5.30](#)

Requires a visual impact analysis with application.

“Visual Impact Analysis. An analysis of the potential visual impacts from the project including solar panels, roads and fencing along with measures to avoid, minimize or mitigate the visual effects shall be required. A plan may be required showing vegetative screening or buffering of the system from those items to mitigate visual impacts.”

Also: Pope County, MN; Stearns County, MN

QUESTION #3 – SCORECARD EXAMPLES

Please provide example of scorecards that were used during the development of a utility-scale solar project. These could be vegetation scorecards or scorecards based around other project criteria. The group would prefer to see score cards applied to projects that were constructed. Aim for 3-5 examples.

Research Note

Many states and institutions have pollinator scorecards available for developer use, but it can be hard to ascertain whether developers actually use them when constructing a specific project. We were able to determine that the first two scorecards were used in projects in Minnesota and Indiana. However, many other scorecards exist that we could not match to specific solar projects. We have several outstanding calls to government agencies, nonprofits, and universities to determine which scorecards have been used in construction; we can provide an update to this research once/if we receive that information. In the meantime, the latter examples are commonly referenced scorecards that we assume have been used in solar project development, though we cannot completely verify it.

Examples

Minnesota Solar Site Pollinator Habitat Assessment

[Link](#)

The Aurora Albany Solar Project used the Minnesota Solar Site Pollinator Habitat Assessment Form for Project Planning developed by the Minnesota Board of Water and Soil Resources (BWSR). According to Dan Shaw, Senior Ecologist/Vegetation Specialist at BWSR, all projects listed in this [March 2022 report](#) have filled out the pollinator scorecard and have met the standards of the [MN Habitat Friendly Solar Program](#). Based on acre size, the Aurora Albany project can be expected to be a good example of a utility-scale solar project that has met the standard. Aurora Albany is in Stearns county, is 120 acres in size, and was built in 2017.

Indiana Solar Site Pollinator Habitat Planning Scorecard

[Link](#)

The Honeysuckle Solar Project used the Indiana Solar Site Pollinator Habitat Planning Scorecard developed by Purdue University. The project is located in New Carlisle, St. Joseph County and is 1,100 acres large, generating more than 150 megawatts of power. The developer is Lightsource BP and the project is currently at the operation and maintenance stage with progress being tracked on their [website](#).

Additional Scorecard Examples

Illinois Planned Pollinator Habitat on Solar Sites [Scorecard](#)
Michigan Pollinator Habitat Planning [Scorecard](#) for Solar Sites
Missouri Pollinator Habitat Planning [Scorecard](#) for Solar Sites
Ohio Solar Site Pollinator Habitat Planning and Assessment [Form](#)
Northern California / Oregon Pollinator-Friendly Solar [Scorecard](#)