Solar Contract Standards

Introduction

This document is intended to provide communities, where solar projects are proposed, with summaries of the Most Favorable Language Found identified in the solar contracts analyzed for 15 utility solar projects over 100 megawatts in Wisconsin. The summaries cover a wide range of standards that can be included in a solar contract with the developer. Contracts are commonly called local operating contracts, joint development agreements, or another name that reflects the solar contract between the community and the solar developer.

Completed solar contracts from Wisconsin solar projects are available on the Wisconsin Land + Water Solar Contracts webpage.

We expect most communities would want to include the following standards in their solar contracts for fiscal and oversight reasons:

1. Project's use of roads and road repair obligations
2. Drainage and tile repair obligations
3. Local government permitting requirements
4. Guaranteed level of revenue sharing for local governments
5. Replacement of lost tax revenue to school districts and technical colleges
6. Assurances in support of decommissioning, which is removing equipment (solar panels, racking, posts, wiring, fences, etc.) and restoring the site after the project reaches the end of its life
7. Professional fee reimbursement for services from legal, engineering, environmental and other experts related to the project including developing and negotiating the solar contract language
8. Establishing lines of communication, compliance and enforcement

Beyond these standards we recommend that communities identify their priorities related to utility-scale solar projects. It is not necessary to include all of the standards in this document in your solar contract.

Possible community priorities and the associated standards are:

- Homes close to the project: If there are non-participating landowners near the site, see setbacks, noise and lighting language

- Wildlife concerns or site located near a wildlife area: See fencing type, fencing location, wildlife corridors, waterway setbacks, wetland setbacks and timing of mowing
- Sandy soils: See wind erosion language
- Returning project site to farmland after solar: See topsoil preservation and decommissioning
- Project adjacent to valued lakes or streams: See waterway setbacks and wetland setbacks
- Flooding concerns: See drainage repair obligations, drain tile repair obligations, waterway setbacks and wetland setbacks
- Wildlife and/or pollinator habitat: See vegetation plan and vegetation management

The standards in this document are presented in the order commonly found in solar contracts (not in order of importance) to make it easier to compare this document with a draft contract. The order is:

1. Project's use of roads and road repair obligations
2. Drainage repair obligations
3. Drain tile repair obligations
4. Local government permitting requirements
5. Erosion control and stormwater management plans
6. Wind erosion
7. Guaranteed level of revenue sharing for local governments
8. Replacement of lost tax revenue to school districts, technical colleges, fire departments and ambulance services
9. Assurances in support of decommissioning
10. Construction phasing
11. Grazing animals
12. Ground cover/vegetation plan with potential for pollinator habitat
13. Vegetation management
14. Topsoil preservation
15. Wetland setbacks

16. Reducing potential impacts on wildlife through project siting, corridors and fencing
17. Visual concerns and buffers for neighboring landowners
18. Noise impacts
19. Lighting and glare
20. Public safety and emergency management
21. Battery energy storage systems
22. Cooperation
23. Professional fee reimbursement
24. Establishing lines of communication, compliance and enforcement

Each standard contains an explanation and a table that includes:

- Most favorable solar contract language found in the solar contracts we analyzed and their source; this is not a complete word-for-word language from the contracts, rather it is a summary. See the solar contract listed and section number to view the complete language.
- How the Most Favorable Language Found benefits local governments and communities
- Wisconsin State Statutes and Best Management Practices (BMP) recommendations
- Unanswered questions in the Most Favorable Language Found

It is important to keep in mind that wording matters. Strong, enforceable language requires an action to be completed or a standard to be met and uses words like “shall”, “must” or “is required to”. Weak language that does not require an action includes “may”, “consider”, “shall be encouraged”, “when necessary” and “when practicable”. Other weak language includes “shall prepare a plan about XX”. This does not include the information required in the plan or standards that must be met in the plan. Be cautious if standards are not clear about the specific locations where they apply, specific measurements, or when they will be completed.

This document does not provide legal advice or a draft contract. Rather, it is a resource to provide examples of language from other solar contracts. Consult with your attorney when developing and negotiating a solar contract. During this process, consider including your reasons for various contract provisions in the contract or in a separate document so that people in your community 20 years or 50 years from now will have some understanding of your goals and reasons for solar contract provisions.

The list does not currently have language for Battery Energy Storage Systems (BESS) or recreational trails. We hope to update this list in the future.

Standards

1. Project's use of roads and road repair obligations

Explanation: Building a solar project involves many heavy trucks hauling in equipment and supplies to build the project and later hauling the equipment out when decommissioning the project. Usage of local roads by these trucks may result in road damage that would impact a local government's finances. Contract language may cover:

- Designation of which sections of which roads may be used to transport solar equipment to the site
- Who will clean mud and other debris off the roads to keep them safe
- Weight limits and speed limits on these roads
- Penalties if solar project related vehicles use non-designated roads
- Assessment/documentation of road condition of designated roads before construction, after construction, and again after decommissioning to determine road damages
- Assessment of road condition of undesignated roads, as heavy trucks hauling solar equipment may not limit themselves to designated roads
- Who will pay for and do the road condition assessments
- Who will fund road repairs due to solar project
- Who will oversee road repairs needed due to solar project
- Similar questions should be answered in the contract for damage and repairs to driveways and private roads

Standard to address	Most Favorable Language Found (Contract, section number)	How language benefits local governments and communities	State Statutes/BMP Recommendations	Unanswered Questions in Existing Contract Language
Maintenance of road conditions	Local governments shall not be responsible for construction or maintenance of any roads within the project site, including snow plowing. (Portage, 2.a)	Certifies that any roads on site shall not increase workload or financial responsibility to the local governments.		
Maintenance of road conditions	Developer shall reasonably maintain the road infrastructure of the construction route consistent with town and county standards. (Muddy Creek, 2.d)	Allows existing local government standards to take precedent regarding road conditions during the project.		Are the town and county road standards clear and enforceable?
Maintenance of road conditions related to mud and debris	None. Proposed language: Developer will clean mud, dirt, and other debris tracked onto roads. If the project fails to do this, then the local government may clean the road/right-of-way and invoice the Developer for the work.	Maintains road safety.		

Maintenance of road conditions	Developer will use commercially reasonable efforts to minimize the traffic in the project area and ensure the safety of citizens in all phases of the project. (Muddy Creek, 2.a)	Good in concept to minimize traffic and ensure safety.		What are “commercially reasonable efforts”?
Identification of roads to be used for solar project	The Public Roads identified in this Section will be the exclusive County and Town roads authorized to be used by construction vehicles (excluding vehicles used primarily for transporting construction employees) for the Project. If the developer needs to use roads not listed herein by construction vehicles, the developer shall negotiate such use with applicable local governments. (Elk Creek, 2.g)	Allows the local governments to negotiate which roads are to be used on top of the previously identified roads.		What components of the contract are valid to be negotiated by the developer. Finances, other roads? “Construction vehicles” should be defined to clarify whether all traffic associated with the project are included. E.g. semi-trucks
Road Repairs	Developer will return the road to a level comparable to the pre-construction conditions or if approved by local governments compensate the local	Provides local governments with the final say in whether the developer will repair the roads or whether local		

	government to repair the roadways to a similar level. (Onion River, 2.d)	government will, adding flexibility.		
Road Repairs	These repairs will include restoring the ditches, slopes, embankments or fills within the right-of-way. (Badger Hollow, 5)	Clearly defines the extent to which road repairs will occur. Identifies pivotal road infrastructure features rather than just the driving surface.		
Assessment	The Parties shall decide upon a scope of work for evaluating the condition of roads, structures, and drainage infrastructure immediately prior to construction, which evaluation shall be at Developer's expense. (Darien, 5)	Establishes the developer as financially responsible for pre-construction evaluation of the roadways.		
Assessment	After the completion of the repairs, the local governments shall provide the developer with a letter stating acceptance of satisfaction of the work. (Badger Hollow, 5)	Grants the local governments the final say about whether repair work is completed to the agreed upon standards.		If work is not satisfactory, what holds the developer responsible?
Funding	If the Town elects to forego the lump sum payment, the	Provides local governments with		Contractor is managed by the developer, so

	parties agree they may also utilize a contractor chosen and managed by the developer to complete necessary road repairs. (Paris Solar, 6)	flexibility in terms of how road repairs are funded. Also establishes a developer selected contractor to conduct the work. This is beneficial if town or county is not familiar with the road repair process or doesn't have staffing needed to complete the repairs.		decision making is done via the developer. Is the lump sum equivalent to what the cost of the contractor provided by the developer would cost?
Private Roads Impacted	The developer shall return those portions of any private driveway or private road affected by the project to the same standards as the public roads. (Maple Grove, 3.f)	Provides neighboring or affected properties with repairs if they are deemed impacted by the project.		Will these driveways be included in the pre-construction report that documents conditions of roadways.

2. Drainage repair obligations

Explanation: Building a solar project involves many heavy trucks hauling in equipment and supplies to build the project and later hauling the equipment out when decommissioning the project. Usage of local roads and site roads by these trucks may result in damage to drainage infrastructure including culverts and ditches that would impact a local government's finances. Contract language may cover:

- Assessment/documentation of drainage infrastructure along designated roads before construction, after construction, and again after decommissioning to determine damages

- Assessment of drainage infrastructure along undesignated roads, as heavy trucks hauling solar equipment sometimes do not stay on designated roads
- Culverts must be restored to their pre-existing conditions, defined as the flow capacity before project construction began
- If drainage infrastructure is broken during construction or life of the solar project, what is the time limit to repair it to avoid flooding solar fields and upgradient lands
- Who will pay for drainage infrastructure assessments
- Who will fund drainage repairs/replacement due to solar project
- Who will oversee repairs
- Provide an option for local government to pay for the difference in cost to replace a damaged culvert with an upgraded culvert to accommodate increased flow from the larger storms now happening

Standard to address	**Most Favorable Language Found** (Contract, section number)	**How language benefits local governments and communities**	**State Statutes/BMP Recommendations**	**Unanswered Questions in Existing Contract Language**
Drainage Infrastructure Repair and Evaluation	a. Developer shall document the conditions of anticipated drainage crossings. b. Developer shall commission a report prepared by a subject matter expert to record pre-construction conditions and a report to record post construction conditions and provide such reports to the	Pre- and post-construction video documentation of drainage. Consults with County LWCD and drainage board.		

	Local Governments and the County Drainage District. These reports will include video documentation. c. Prior to the commencement of construction, Developer will consult with the County Drainage District and the County Land and Water Conservation Department for review and comment prior to submitting final design plans to the County for the items identified above in Section 1, Item B. (Badger State, 3)			
Drainage Infrastructure Repair and Funding	If not provided in the Erosion Plan, the developer shall have (90) days prior to the completion of the construction to provide the local governments with a plan in which to (a) remedy damage to public drainage infrastructure, if any, within the Project footprint, caused by construction activities that negatively impact drainage systems, and if	Developer will fund the drainage infrastructure to pre-existing condition. Creates a timely and enforceable timeline.		

	applicable (b) compensate the applicable Local Government to repair such public drainage infrastructure to a level comparable to the pre-construction level. Developer shall complete all relevant repairs within (60) days of the local government's approval of the drainage infrastructure repair plan. (Elk Creek, 3.c)			

3. Drain tile repair obligations

Explanation: Some solar projects are proposed on lands that have a tile system underneath to drain the fields. Maintenance of the drains and ditches is overseen by the County Drainage District, so consult with them where drain tiles are present. Use of heavy equipment in these fields during solar construction and decommissioning may damage drain tiles. Damaged drain tile can result in sediment discharge or flooding in unexpected locations. Locating and showing the drain tile locations on the erosion control map can help the contractor avoid damage to existing drain tile. Where grading or excavation is proposed, drain tile may need to be replaced if they are damaged during construction or decommissioning. A plan for repairing or replacing damaged drain tile should be included in the construction documents. The standard of drain tiles can be folded into drainage repair obligations, as done in the Vista Sands contract. Contract language may include:

- Requiring a map showing drain tile locations
- If tiles are broken during construction or life of the solar project, what is the time limit to repair or replace them to avoid flooding
- Who will fund tile repair or replacement due to solar project

- Who will oversee tile repair or replacement

Standard to address	Most Favorable Language Found (Contract, section number)	How language benefits local governments and communities	State Statutes/BMP Recommendations	Unanswered Questions in Existing Contract Language
Consult with the County Drainage District	None. Recommended language: Consult with the County Drainage District if there are legal drains on the project site. Developer will pay for drain cleanout prior to and during construction.	Ensure the District is able to negotiate on fence setbacks so that they had enough space for future maintenance.		
Drain tile assessment and repair	Developer agrees to repair or replace any drain tiles damaged by the Developer. Developer shall provide the drain tile maps of the project footprint to the local governments and shall design the project to avoid any damage to known project drainage tiles. The developer shall have 90 days prior to the completion of the project to provide the applicable	Developer becomes aware of drain tile locations by submitting map of them early in the planning process. This assists developer in project planning to avoid damaging tiles. After construction, developer must provide a plan for remedying or paying for tile damage.	Drain tile outlets should be checked for appropriate vegetative filtration especially during construction phases when the potential for water loss is higher.	When will developer be required to submit map of drain tile locations or tile outlets to the local government? To minimize damage to tiles, choose a date as early as possible in project planning. Identify in JDA: Who is responsible for all expenses related to

	drain tile map to the local governments as well as a plan to (a) remedy damage to public and private drainage infrastructure within the project footprint caused by construction activities that negatively impact drainage systems outside of the project footprint including promptly repairing or replacing any drain tiles that are damaged during construction and if applicable (b) compensate the applicable local government to repair such public drainage infrastructure to a level comparable to the pre-construction level. (Vista Sands, 3.)			repair or replacement of broken tiles? Who will oversee the repairs or replacements? If no drain tile map is required, state that if tile damage happens, repairs are required similar to (a) and (b) in "Most Favorable Language Found" column.

4. Local government permitting requirements

Explanation: Local governments have ordinances and require permits for use of public roads and drainage systems, such as driveway permits, utility permits, and rights-of-way crossing permits. Local governments also have standards related to roadway setbacks and building and zoning permits for buildings such as Operation and Maintenance buildings. Contract language often requires solar developers to obtain all permits typically required of others under the local government ordinances. In exchange, local

governments agree to not withhold permits to hamper a solar project. Local government staff need a record of locations where solar projects are built to include in their land permit database.

Here is an example from the Vista Sands Solar contract:

> Project's Use of Roads and Road Repair Obligations. …The Parties acknowledge that in connection with construction, operation and maintenance of electric collection lines, communications cables, and other equipment (collectively, the Facilities), Project Facilities may cross or use approved road rights-of-way and/or drainage systems. *Developer shall seek and obtain all permits typically required of others under the applicable Local Government ordinances for use of public roads, such as driveway permits, utility permits, and rights-of-way crossing permits, and Local Government shall not unreasonably withhold such approval*. All underground borings shall commence and terminate outside of the right-of-way, unless otherwise approved by the applicable permitting entity.

From the Badger State Solar contract:

> Compliance with Laws. Developer shall at all times comply in all material respects with all federal, state and local laws, statutes, ordinances, rules, regulations, judgments, and other valid orders of any government authority with respect to its activities associated with the Project and shall obtain all material permits, licenses, and orders required to conduct any and all such activities.

5. Erosion control and stormwater management plans

Explanation: The Wisconsin Department of Natural Resources (DNR) requires Erosion Control and Storm Water Management Plans associated with DNR NR 216 Permits for projects with 1 acre or more of site disturbance. DNR Plan Requirements and Technical Standards can be viewed. Requiring copies of these plans be provided to the towns and County Land and Water Conservation Department ensures they will know how erosion and stormwater will be managed, as they will likely be contacted in the event of an onsite erosion or stormwater issue. Also see Stormwater Measures for Ground Mounted Solar by Wisconsin DNR stormwater staff.

Based on experience with utility-scale solar projects the following steps are recommended for stormwater and erosion control:

- During the earliest meetings with the developer, before the site plan is complete and before the CPCN application is submitted, point out the need to leave sufficient space for sediment basins and sediment traps in the low areas of the site. Silt fence is not designed for sediment control for large areas and is not sufficient by itself. For example, silt fence is not designed for concentrated flow and is likely to fail if placed across a ditch or near a culvert discharge.
- Stormwater basins should be completed prior to large scale site disturbance. On a past project where stormwater basins were not completed before construction started, a storm came that the basins didn't handle, resulting in offsite problems.
- Experience has found that cover crops are more successful when the property owners who have farmed the land for many years plant the cover crops because they know how to stabilize their land and do not need DNR permits to plant an existing agricultural field.
- Establishing a cover crop prior to the start of construction is recommended because:
  - *Established vegetation can reduce slips, trips and falls; thereby increasing worker safety*
  - A cover crop provides a denser cover and better erosion control than crop residue during active construction.
  - Cover crop seeding is typically the most inexpensive form of erosion control

The USDA Wisconsin Agronomy Technical Note 6, page 12 Temporary Cover and Companion Crops, identifies seeding dates for cover crops based on the specific cover crop and the county of interest. If the cover crop is planted late or has not received rain for germination, additional watering may be necessary to support plant growth. Where watering the entire area is not feasible, focus on watering the edges of fields and along waterbodies and wetlands to achieve germination. Ditches, concentrated flow channels, should also be prioritized. Cover crop seed and watering typically cost far less than trying fix problems from winter rains on unstabilized land.

For large solar projects, consider setting a maximum area of land (e.g. 200 acres) that can be open without stabilizing vegetation at one time. Otherwise, the solar project may have 1000 acres of open land at one time. Choosing the maximum open land area is a balancing act because if you make it too small construction activities aren't efficient and the land is unprotected longer than necessary, while if it's too big you have more open land open to erosion. Some solar contracts include a rolling acreage where if they

have half of the first 200-acre open area has been stabilized, then the developer may open up another 100 acres. Consider how the local government will track open land, which could involve access agreements to access the site with the developer for inspections or using a drone.

DNR requires a detailed description of temporary and permanent erosion and sediment control measures to be utilized during and after construction of the project. If the project would involve one or more acres of land disturbance, the applicant's request for permits under Wis. Stat. § 30.025 must identify the need for coverage under the Construction Site Storm Water Runoff General Permit from DNR. The permit application must be submitted through DNR's electronic Water Permits system after the PSC order. This permit may also authorize construction site dewatering discharges under certain conditions.

The Storm Water Permit and Wis. Admin. Code ch. NR 216 require a site-specific Erosion Control Plan, Site Map, and Storm Water Management Plan. The permittee would be required to implement and maintain, as appropriate, all erosion and sediment control practices identified in the plans from the start of land disturbance until final stabilization of the site. Final stabilization means that all land-disturbing construction activities at the construction site have been completed and that a uniform perennial vegetative cover has been established with a density of at least 70 percent of the cover for the unpaved areas and areas not covered by permanent structures or equivalent stabilization measures. The Erosion Control Plan, Site Map, Storm Water Management Plan, and any supporting documentation (such as modeling input/output, design specifications, geotech/soil report, site photos, etc.) must be submitted with the Storm Water Permit application through the DNR's ePermitting system.

Presentation: Storm Water Measures for Ground Mounted Solar by DNR Stormwater Staff

Standard to address	**Most Favorable Language Found** (Contract, section number)	**How language benefits local governments and communities**	**State Statutes/BMP Recommendations**	**Unanswered Questions in Existing Contract Language**
Erosion Plan Review	Prior to construction developer will consult with the local Land and Water Conservation Division for review and comment and	This allows for local experts in the field to provide guidance regarding the Erosion		

	will modify the Erosion Plan for any reasonable recommendations made by them. (Muddy Creek, 3.b)	Plan and potentially modify it.		

6. Wind erosion

Explanation: Significant wind erosion has occurred on solar projects with sandy soils when vegetation or crop residue was removed in fall. Results included sand drifts on roads and in ditches. Frozen ground does not equate to stabilized ground; especially in well-drained soils because there is no ice to help hold the soils in place. Wis. Admin. Code ch. NR 216 about Storm Water Permits which include Erosion Control Plans explicitly defines "erosion" as the process by which the land's surface is worn away by the action of wind, water, ice or gravity (NR 216.002(7)). PSC, based on DNR staff comments during the Certificate of Public Convenience and Necessity (CPCN) process, sometimes requires solar developers to submit a site-specific winter construction and stabilization plan as part of their stormwater permit that includes measures to stabilize bare soils before and during winter conditions. This plan may include leaving crop residue in place in the fields or establishing a cover crop such as annual ryegrass or oats early enough in the season so there is time for it to receive necessary rain to germinate and establish root systems to hold soil in place before the end of the growing season.

Experience has found that cover crops are more successful when the property owners who have farmed the land for many years plant the cover crops because they know how to stabilize their land and do not need DNR permits to plant the cover crop in their existing agricultural fields. Establishing a cover crop prior to the start of construction is recommended because:

- Established vegetation can reduce slips, trips and falls; thereby increasing worker safety
- A cover crop provides a denser cover and better erosion control than crop residue
- Cover crop seeding is typically the most inexpensive form of erosion control

The USDA Wisconsin Agronomy Technical Note 6, page 12 Temporary Cover and Companion Crops, identifies seeding dates for cover crops based on the specific cover crop and the county of interest.

No solar contract language specific to wind erosion is currently available. However, local governments could include language similar to the language in the first paragraph of this section that requires the developer to submit a winter stabilization plan to DNR and the local governments describing what steps will be taken to achieve winter stabilization to minimize wind erosion.

7. Guaranteed level of revenue sharing for local governments

Explanation: Lands used by solar projects are removed from local property taxes. Wisconsin Statutes require that the Wisconsin Department of Revenue makes utility aid payments to local governments (towns, counties, cities and villages where the project is located) totaling $5,000/MW annually, for the project's lifetime. These payments are designed to replace local property taxes for utility projects that pay state taxation and are certified by the Department of Revenue. See Factsheet and Wisconsin Property Taxes Calculator. The utility aid payments begin after a solar project is producing electricity, but not during construction. Local governments can negotiate to not have utility aid payments reduced or eliminated if state law changes.

Example contract language:

> If a change in law results in the elimination or reduction of the Utility Shared Revenue program, the elimination or reduction of the generator license fee (under Wis. Stat. § 76.28 and §76.29), and the land used by the Project is not returned to the applicable taxing jurisdiction's property tax rolls, which result in tax payments to the County in an amount less than what was previously being received through the Utility Shared Revenue program, then Project Owner will compensate County and Local Units of Government for the difference between the lost property tax revenue and the previous payments received by County and Local Units of Government, up to the amount of the Project's prior year's generator license fee (under Wis. Stat. § 76.28 and §76.29). (Badger State, 4.g)

8. Replacement of lost tax revenue to school districts, technical colleges, fire departments and ambulance services

Explanation: Lands used by solar projects are removed from local property taxes. Wisconsin Statutes require that the Wisconsin Department of Revenue makes utility aid payments to local governments (towns, counties, cities and villages where the project is located) totaling $5,000/MW annually, for the project's lifetime. These payments are designed to replace local property taxes for

utility projects that pay state taxation and are certified by the Department of Revenue. See Factsheet and Wisconsin Property Taxes Calculator.

State laws do not provide local school districts, technical colleges, fire departments or ambulance services with utility aid payments or other compensation for loss of property taxes due to solar projects. Loss of property taxes for school districts and technical colleges due to solar projects must be calculated and included in the contract with the solar developer to avoid reductions in school funding. Some contracts include inflation and coverage of future school referendums in school funding language.

Standard to address	**Most Favorable Language Found** (Contract, section number)	**How language benefits local governments and communities**	**State Statutes/BMP Recommendations**	**Unanswered Questions in Existing Contract Language**
Replacement of lost tax revenue to school districts, technical colleges, fire departments and ambulance services	The lost revenue program will calculate the amount of lost revenue based on local tax rates for similar land and provide payment, including any future changes resulting from referendum. Payment amount for each taxing authority will be increased annually by two percent. Payments made through the Lost Revenue Program shall be made directly from Project Owner to the impacted local taxing bodies, and payment shall not be made to the County in order to disburse these	Ensures school districts and tech colleges, fire departments and ambulance services do not have reduced property tax revenue due to solar project. Covers changes due to school referenda. Also includes annual increase to cover inflation.		When will local governments, school and technical college agree on payments?

	funds. An annual accounting documenting payments made under the Lost Revenue Program shall be provided to the County upon request. (High Noon, 12) Fire department and ambulance service included. (Badger Hollow, 9)			
Replacement of lost tax revenue to school districts	Fee is in lieu of all other taxes on all property used and useful in the Project and that the Amery and Clayton School Districts (the Districts) do not directly receive any portion of the Utility Shared Revenue Payment. Developer shall establish a community fund (Community Fund) to provide the Districts a total of $200.00 annually per each installed MW of alternating current at the Project within each District's per each installed MW of alternating current at the Project within each District's boundaries. The Community Fund payment shall be made once per year for a total of 20 years beginning the first year of commercial operation of the Project. The Community Fund payment shall be prorated in	Known annual payment per MW of solar for 20 years when in commercial operation to cover reduced property tax revenue due to solar project. Paid to community fund that distributes to school districts.		Does it cover the reduced property tax? Will these payments keep pace with increased property taxes over time? Will future school referenda payments be covered? What if the project is in operation for over 20 years?

	years where the Project was not in commercial operation for the full calendar year, and in no event will exceed the annual amount described in this Section 5. Apple River Solar shall distribute the Community Fund payments between the Districts in the amounts jointly agreed upon by the each of the Districts as set forth below: 1) 80 percent of the total annual payment to the Amery School District 2) 20 percent of the total annual payment to the Clayton School District (Apple River Solar, 5)			

9. Assurances in support of decommissioning

Explanation: Solar projects have a typical lifespan of 25 or more years. Then the project site may be reused for solar or the solar project may be removed (decommissioned) and the land changed to another land use. The Wisconsin Administrative Code about Wind Energy Systems contains a section about decommissioning that provides ideas. Wisconsin does not have an administrative code for solar energy systems. The PSC & DNR Application Filing Requirements Electric Generation Projects applies to solar and requires developers to provide a plan covering three decommissioning topics, but does not cite specific standards.

Multiple questions need to be answered in the solar contract related to future land uses after the solar project:

- What land use(s) will the project site be changed to after solar? E.g. agricultural (cultivated or pasture), wooded, conservation/prairie, park, residential, commercial, industrial
- What, if any, equipment from the solar project is allowed to be left on site? E.g. fences, if desired at the time of decommissioning by local government, underground wiring, underground posts? Are buildings with basements planned?
- How much will it cost to decommission the solar project?

- Who will pay for and oversee the decommissioning/solar project removal?
- What soil and vegetation work will be needed to prepare it for the next land use?
- What is the timeframe for decommissioning?
- Is there an existing solar panel recycling facility that will take the type of panels to be used in the solar project?

Check the future land use map in the local government comprehensive plan to see what future land uses are planned for the solar project site. Depending on the future land uses planned for after solar, what removal of solar equipment is needed and to what depth to allow the future land use?

Standard to address	**Most Favorable Language Found** (Contract, section number)	**How language benefits local governments and communities**	**State Statutes/BMP Recommendations**	**Unanswered Questions in Existing Contract Language**
Assessment	On or before the twentieth anniversary parties shall review and update the decommissioning plan every five years until decommissioning is complete. (Vista Sands, 5.e)	Ensures plans are up to date with changing markets and strategies.		Does the plan get reviewed while decommissioning is taking place?
Assessment	Town and developer shall agree on the independent engineer (Conducting the analysis of necessary financial assurance). (Wood County, 3)	Ensures the local government has a say in who is conducting the analysis and can use a trusted source.		
Requirements in Decommissioning	The decommissioning plan shall require at least the	This provides the developer with		Once one of the objectives is met, how

	following to be completed within 12 months after the project is done operating: removal of all above ground components with proper dismantling and restoration of the property to a reasonably similar condition as prior to construction using decompaction and reseeding. (Wood County, 3)	requirements of what must be done and a reasonable timeframe that ensures a quick return to the original land use.		long is the estimated timeframe to complete decommissioning?
Requirements in Decommissioning	Remove, at its expense, all Project components including, but not limited to, solar arrays and associated facilities to a depth of 4 feet and properly dismantle all components; Restore the land to a condition reasonably similar to pre-existing conditions, which shall include the removal of gravel parking lots and storage yards, de-compacting areas where Project access roads were installed, and de-compacting any other areas	Provides a detailed description of what areas and components to expect will be included in the decommissioning plan.		Will gravel roads be removed if this is the preference of the landowner?

	of substantial soil compaction. (Darien, 22)			
Financial Assurances	The financial assurance set forth herein and the decommissioning plan filed shall survive the termination of the agreement until decommissioning is complete. (Apple River, 6.d)	Retainment of the agreement protects local government from the developer not following through agreements due termination of the agreement.		
Financial Assurances	If the project is acquired by a utility or cooperative with service territory in Wisconsin, no Financial Assurance shall be required. Financial Assurance shall be required if the project is acquired by any entity other than a utility or cooperative with service territory in Wisconsin (Non-Utility Acquiring Entity). A Non-Utility Acquiring Entity shall be required to maintain the Financial Assurance and decommissioning requirements set forth in this Agreement and the	This ensures that if the project changes hands to another private entity, financial assurance is still required.		If a utility acquires the project, why is there no financial assurance?

	decommissioning plan filed with the PSCW. (Elk Creek, 5.b)			
Financial Assurances	If the costs of decommissioning are agreed to be higher than the plan set with the PSCW financial assurance shall be promptly increased to cover the cost. (Vista Sands, 5.f)	Ensures that adequate funds are provided after all payments have been made.		What if decommissioning is cheaper than expected? What happens to the excess funds?
Decommissioning updates	None. Recommended language: Solar project shall submit a report yearly to the local governments on or before March 31 that summarizes the prior year. The report shall include an update or review of the decommissioning plan.	Keeps solar project company and local governments on the same page regarding decommissioning.		

10. Construction Phasing

Explanation: Phasing the solar construction project is important to minimize the bare soil and open disturbed area at any one time to minimize soil loss due to water erosion and/or wind erosion. Water erosion is a larger problem on heavier soils, steeper slopes, and where runoff is channeled. Wind erosion is a larger problem on sites where vegetation and/or crop residue has been removed, soils are disced/plowed, and in sandy soils. In the Central Sands, significant wind erosion has occurred at solar projects that led to sand drifts on roads and dust events in nearby villages.

For large solar projects, consider setting a maximum area of land (e.g. 200 acres) that can be open without stabilizing vegetation at one time. Otherwise, the solar project may have 1000 acres of open land at one time. Choosing the maximum open land area is a balancing act because if you make it too small construction activities aren't efficient and the land is unprotected longer than necessary, while if it's too big you have more open land open to erosion. Some solar contracts include a rolling acreage where if they have half of the first 200-acre open area has been stabilized, then the developer may open up another 100 acres. Consider how the local government will track open land, which could involve access agreements to access the site with the developer for inspections or using a drone.

Local jurisdictions may have different requirements for how disturbed areas must be temporarily stabilized. Cover crop seed is typically the most inexpensive form of erosion control. For multi-phased sites, work should be staged so that land disturbing activities progress sequentially with crews following to stabilize areas.

Experience has found that cover crops are more successful when the property owners who have farmed the land for many years plant the cover crops because they know how to stabilize their land and do not need DNR permits to plant the cover crop. Establishing a cover crop prior to the start of construction is recommended because:

- Established vegetation can reduce slips, trips and falls; thereby increasing worker safety
- A cover crop provides a denser cover and better erosion control than crop residue during active construction

The USDA Wisconsin Agronomy Technical Note 6, page 12 Temporary Cover and Companion Crops, identifies seeding dates for cover crops based on the specific cover crop and the county of interest.

Standard to address	**Most Favorable Language Found** (Contract, section number)	**How language benefits local governments and communities**	**State Statutes/BMP Recommendations**	**Unanswered Questions in Existing Contract Language**
Phasing means to break the project work into identifiable phases	The project may take place through one or more phases at the choice of the developer. In the event the developer elects to			Wording is vague and does not commit to definite project phases

	construct the project in phases, the obligations of the developer will relate only to the respective phase of the project being worked on by the developer. (Badger Hollow, 24)			How many acres of land in the project will be disturbed or non-vegetated at one time?

11. Grazing animals

Explanation: Using grazing livestock to manage the vegetation at solar facilities can help meet both solar operator and farmer goals. If the site will be grazed by livestock, coordinate with experienced graziers to determine appropriate seed mixes, wire placement, and fencing needs. It is important to avoid plants that are highly toxic to sheep in the seed mix, but aside from that there can be a range of vegetation mixes, from a pasture mix designed for sheep nutrition to a mix of native perennials designed to support general biodiversity and pollinators. If the farmer plans to use wool sheep it may also be a good idea to avoid plants with burs. Other considerations include no use of pesticides without permission from both the solar operator and farmer and site access as needed by both parties. For more information see American Solar Grazing Association factsheets and best practices and the Solar Grazing Checklist.

Standard to address	Most Favorable Language Found (Contract, section number)	How language benefits local governments and communities	State Statutes/BMP Recommendations	Unanswered Questions in Existing Contract Language
Grazing Requirements	If grazing practices are used developer shall adhere to provisions related to animal number limits set by the town zoning ordinance. (Onion River, 7.e.2)	Ensures the project is held to the same standards and rules as the rest of the community.		

Grazing Process	Developer will follow a Natural Resource Conservation Service grazing plan and will also notify the town within five days of animals arriving regarding: animal type, location, number and time on site for the animals. (Onion River, 7.e.2)	Following the NRCS plan will ensure that all proper steps are taken.		

12. Ground cover/vegetation plan with potential for pollinator habitat

Explanation: Each utility-scale solar project takes up hundreds to thousands of acres of land. A well-designed and well-implemented ground cover/ vegetation plan has many potential benefits including:

- Improved water quality due to reduced sediment and nutrient runoff, fertilizer application, herbicide and pesticide use.
- Improved stormwater storage and infiltration due to diverse and dense ground cover.
- Improved erosion control due to soil stabilization of deep rooted and dense fibrous rooted vegetation.
- Improved agricultural productivity due to progression and accumulation of native bacteria, microbes moisture content, and root network.
- Improved habitat for wildlife including pollinators and birds.
- Improved neighboring farm productivity due to increased pollinator activity.

(Invenergy, Paris Solar-Exhibit D, Ground Cover Strategy, Executive Summary)

County Land and Water Conservation staff often have expertise in native vegetation planning and management and may be consulted on this standard. During construction, maintaining crop residues (e.g. cornstalks to hold soil in place) and vegetation to the greatest extent possible limits water and wind erosion. See the Construction Phasing and Wind Erosion sections of this document for more details.

Most of the land in a solar project is in solar arrays, and a small portion of land is around the edges of arrays and outside of the fences of the project. It is highly recommended that a native seed mix with flowering species be planted along with a cover crop as soon as possible after construction and be used not only around the perimeter of the solar facility but within and under the panel arrays as well.

Native flowering plants will benefit the state's pollinators which include butterflies and bumble bees - many of which have been in steady decline in recent years. Threats such as climate change, pesticide use, and habitat loss are having a devastating impact on their populations. Compared to croplands, solar projects have the possibility of supporting a greater diversity of insects, including pollinators, but it takes knowledgeable people with a commitment to choosing native, diverse seeds, careful planning, and timing planting, including:

- Are the species native to this area of the state and suited to the project soils?
- Do they include native flowering species that feed pollinators?
- Do they include multiple species of native flowering species that bloom in each season to avoid periods without nectar?
- What percentage of the seed mix under and in between solar panels is flowering species? Seed mixes planted under and in between solar panels in a Minnesota study generally contained 25-40% flowering species (forbs). See reference for plant species that were most successful at these sites. A study of insects at native plantings at two solar projects in Minnesota (35 acres and 42 acres) found increased native bee abundance, insect group diversity, and total insect abundance compared to the row crops that grew there prior.

The success of the plantings also depends on seed quality, how the site is prepared for planting, what time of year it's planted, and how it's planted. Prioritizing these steps in the construction project scheduling and working with people experienced with large-scale native plant planning and installation (e.g. native plant nursery staff, land conservation staff).

Seed mixes which include non-native, aggressive species such as red fescue or Kentucky bluegrass, may be able to reach quicker ground stabilization; however, these species typically form dense mats of vegetation that do not allow for most native species to become established. Warm season prairie species are slower to grow above ground and instead spend their first year or two developing roots. Over time, those roots can extend to 10 feet or more below ground. While these plants take longer to fill in and obtain a look of above ground stabilization, their roots are feet deeper than red fescue and other cool season grasses: thereby

stabilizing the ground below. By mixing these species with warm season prairie plants, even at a low seed rate, there is concern that they could quickly outcompete the prairie plants and not allow them to survive long-term. For better long-term ground stabilization, it is beneficial to not include these species in the seed mix from the beginning when feasible.

If the site or a portion of the site will be grazed by livestock, see the "Grazing animals" section of this document or coordinate with experienced grazers to identify appropriate seed mixes.

Standard to address	**Most Favorable Language Found** (Contract, section number)	**How language benefits local governments and communities**	**State Statutes/BMP Recommendations**	**Unanswered Questions in Existing Contract Language**
Ground Cover-Vegetation Management Agreement	The Parties agree that the Project Owner has hired a regionally qualified consultant to create a ground cover and vegetation management plan for the construction and operation of the project, attached as Exhibit D. Consultation shall occur with the Town during the pre-construction meeting and post-construction meeting. Where commercially reasonable, the Project will utilize native plants and grasses across the project's developed area and incorporate pollinator habitat. During Project	A plan created by a professional creates a reliable method of reducing the negative impacts of construction on the surrounding community.		How much of the plan will be implemented, and will the plan be enforced?

	operation, the Project Owner will spray, mow, and otherwise maintain all developed acreage inside the fence. (Invenergy, Paris Solar, 7)			
Decompact the Soil Before Planting Seed	No solar contract language yet. Proposed language: Solar project will take proactive steps in ensuring native soil is preserved and soil compaction is prohibited. If soil is compacted during construction, the soil shall be decompacted and a report submitted to the County Land and Water Conservation Department (or Town).			
Vegetation Areas Planted	Several different vegetation types will be planted because differing microhabitats in the solar farm will require different kinds of vegetation and management. The vegetation Zones that may be planted include:		It is highly recommended that a native seed mix with flowering species be planted along with a cover crop as soon as possible after construction and be used not only around the perimeter of the	

	Sedge Grass Only Cover Zones — A planted and maintained native Sedge and Grass Only Cover mix for Upland soils and Moist soils. This zone would be suitable for grazing with some modification. Pollinator Habitat Zones — A Pollinator seed mix for upland soils and moist soils. Monarch Corridor Zone — Favors monarch butterflies by featuring specific milkweed varieties selected to grow to approximately 18 inches maximum height for their food production and habitat creation. Diverse Habitat Zones — Adds more plant variety and high-quality pollinator and wildlife habitat to Upland soils and Moist/hydric soils Zones. Native Seed Production Zone —Potential areas for short stature native seed production.		solar facility but within and under the panel arrays as well. This native mix will benefit the state's pollinators, which include butterflies and bumble bees - many of which have been in steady decline in recent years.	

	View Screening Zone — Limited areas within the site to obscure or soften solar farm views, as requested by neighbors or regulators. Familiar Crop Screening Zone —Areas where familiar crops can help transition to native plantings, soften views or screen. (Invenergy, Paris Solar-Exhibit D, Ground Cover Strategy, Executive Summary)			

13. Vegetation Management

Explanation: Vegetation management includes mowing practices and weed control. The timing of mowing affects animals that depend on the plants for food and shelter. Both food and shelter are significantly reduced for a period of time after mowing. Species that are known to be impacted are grassland birds (i.e. bobolinks, meadowlarks, etc.) whose nests can be destroyed, birds and other animals that rely on the native plants for food, and pollinators who depend on native flowering plants for nectar and pollen. Mowing can also be used to control invasives.

Site preparation may include weed management by herbicide applications. After site vegetation is established, noxious weed and invasive species can be managed through mowing and spot application of herbicides.

Groundwater quality depends on the type and quantity of fertilizers and herbicides that are applied to the land. Unlike row crops, solar projects typically have no fertilizer applications, thereby no nitrogen which can convert to nitrate in groundwater. Targeted or spot application of herbicides reduces use compared to widespread herbicide application. Some herbicides move to groundwater.

Standard to address	Most Favorable Language Found (Contract, section number)	How language benefits local governments and communities	State Statutes/BMP Recommendations	Unanswered Questions in Existing Contract Language
Mowing Requirements	Mowing shall not occur within the Project area between April 15 to August 1 of each year within one mile of greater prairie-chicken leks. Throughout the entire Project, and after the initial establishment phase; Vista Sands Solar will seek to restrict mowing so as to not disturb pollinator habitat prior to September 15 (Vista Sands, 6 d.)	Identifying seasonal mowing times helps protect pollinators and grassland birds which may also include nesting habitat.		
Herbicide Application	Noxious weed and invasive species shall be managed through mowing and targeted applications of commercially available herbicides. After site vegetation is established, the Project shall not use broad applications of herbicides. (Savion, Wood County, Town of Saratoga 16.)	Limiting the use and timing of herbicides protects vegetation for wildlife and pollinators		

14. Topsoil Preservation

Explanation: Soils at a solar project will see many changes. Consider how these changes will affect the ability to farm the land or establish vegetation after decommissioning and include conditions in the solar contract to address these changes.

1. Initial construction sometimes includes stripping all topsoil and piling it, plus grading to level the site. Depending on the project size, construction may take 1-3 years. Heavy equipment will affect soil structure and compact soils. Taking measurements of soil density before and after construction provides accurate information about compaction. It may be hard to get a good stand of diverse native species established if and where soil is compacted. If topsoil is stripped, how will it be reapplied to the site? See Vegetation section of this document for information about planting the site and advantages of native species.
2. Solar project operation includes growing vegetation. If deep-rooted native plants are used throughout the site they will likely help improve soil structure and add organic matter over years. If deep-rooted native plants are only used around the perimeter of the site, they will only improve soil health in those areas. Vegetation management typically includes mowing and/or grazing and may include spot application of herbicides to manage aggressive weeds.
3. Decommissioning may take a year or more. Heavy equipment will affect soil structure and compact soils. Is heavy equipment limited to defined areas of the site? Will gravel roads be removed? Will compacted areas be decompacted? Using what methods and to what extent? Provide a map showing where decompaction will happen. See Decommissioning section of this document for more information.

If the solar contract does not address what happens to the topsoil, some of it could be sold for profit. Keeping the topsoil on site is crucial for robust vegetation growth and possible pollinator habitat, as well as for farming the land after decommissioning the solar project. Similarly, the topsoil should be protected from water and wind erosion with cover crops or permanent vegetation during construction, during the life of the solar project and after decommissioning. See Soil Health in Solar Development for more information from the Center for Rural Affairs.

Standard to address	Most Favorable Language Found (Contract, section number)	How language benefits local governments and communities	State Statutes/BMP Recommendations	Unanswered Questions in Existing Contract Language
Practices during decommissioning	Restoring farmland as part of the Decommissioning Plan. Project shall comply with all requirements of the Decommissioning Plan and all Applicable Laws related to restoration of farmland, including those requiring removal of equipment without deteriorating the quality of the surface soils for growing of crops, the planting of a cover crop to prevent the erosion of soils, and the removal of active erosion controls, such as silt fencing, after the cover crop is established. (Onion River, 5)	Talks about how surface soils (topsoil) will not be deteriorated while removing solar equipment and that a cover crop will be planted at the end before erosion controls are removed.		What practices will be used to prevent topsoil deterioration during decommissioning? Keeping heavy equipment on gravel roads? Will topsoil remain on site during initial grading and building of the solar project? Keeping topsoil ensures the owner of the property is not losing a viable farming asset in nutrient rich topsoil.
Practices during decommissioning	Restore the land to a condition reasonably similar to pre-existing conditions, which shall include the removal of gravel parking lots and storage yards, de-compacting areas where Project access roads were	Includes removal or some gravel areas and decompaction of soils.		Decompaction to what standard? What was initial soil density? Will topsoil remain on site during initial grading

	installed, and de-compacting any other areas of substantial soil compaction. (High Noon, 23)			and building of the solar project?

15. Wetland setbacks

Explanation: Wetlands benefit people and the natural world by providing critical habitat for wildlife, water storage to prevent flooding and protect water quality, and recreational opportunities for wildlife watchers, anglers, hunters, and boaters. The DNR requires a wetland field delineation in all project areas where project infrastructure (i.e., arrays, fence lines, driveways, substation, etc.) is proposed and may be required in areas where land will be disturbed (i.e. topsoil removal and grading). Projects should be designed to avoid and minimize impacts to wetlands. Many counties and communities also require wetland setbacks to provide additional protection.

Standard to address	**Most Favorable Language Found** (Contract, section number)	**How language benefits local governments and communities**	**State Statutes/BMP Recommendations**	**Unanswered Questions in Existing Contract Language**
Wetland Setbacks	None.	This wetland setback protects the wetlands by limiting soil compaction from heavy equipment, vegetation damage/destruction, and retaining wildlife value. Many counties have adopted wetland setbacks (Table 5) for these reasons, and to		

		avoid poor investments in structures that may become wet and/or unstable due to being built directly on the edge of a wetland.		

16. Reducing potential impacts on wildlife through solar project siting, corridors and fencing

Explanation: Potential impacts to wildlife can be reduced through three steps:

1. Siting – avoid key habitat
2. Corridors – maintain or create
3. Fencing to let wildlife species through

Siting

Avoid siting solar projects on or near valuable wildlife habitat including state wildlife areas, federal wildlife refuges, high quality forests or grasslands. Solar arrays are fenced, and fences are barriers to animals that cannot get through, under, or over the fence. Fences also reduce habitat for prairie/grassland wildlife species that stay away from tall structures including fences, where raptors perch to hunt.

Prior to project design and layout of panels, roads, power lines and other infrastructure, the solar developer should request a review through DNR's Endangered Resources Review page. The review will provide specific requirements and recommendations to avoid and/or minimize impacts to endangered and threatened resources, if a possibility for impacts in the project area is identified. The Endangered Resources Review will also include information regarding other areas of potential concern, such as Important Bird Areas or high-quality habitat. The DNR Endangered Resources Utility Liaison's recommendations are included in the PSC/DNR Environmental Analysis or Environmental Impact Statement, part of a project's CPCN review. The PSC sometimes follows these recommendations.

Corridors and fencing

The National Electrical Code requires fences around solar arrays and substations. Fencing thousands of acres of land can take 20 miles or more of fence and can be a concern for both small and large wildlife movement. Fences are barriers to animals that cannot get through, under, or over the fence and to prairie/grassland wildlife species that stay away from tall structures including fences, where raptors perch to hunt.

When not located prudently, large scale solar projects can inhibit the movement of large mammals such as deer, elk, wolves, and bears. The fenced arrays act as a barrier which could cause habitat fragmentation and disruption to daily movement and migratory patterns. For example, where a solar facility fence line runs parallel to a road, especially when the fence line is on both sides of the road, large mammals may follow the fence line due to the restricted corridor which may result in an increase in large mammal-vehicle collisions. It is also possible that once agricultural lands become fenced solar arrays, deer may congregate into the remaining agricultural lands for foraging purposes, resulting in increased agricultural damage.

To create/maintain wildlife corridors and facilitate small and large wildlife movement and success, local governments should consider including these factors in their solar contracts:

- Ensure large enough fence setbacks along roads, especially where solar arrays are proposed on both sides of the road
- Divide large fenced solar arrays, such as over 300 acres, into smaller arrays to establish unfenced corridors for wildlife and other community uses
- Maintain wildlife corridors along navigable and non-navigable waterways by applying setbacks for fences

Fencing standards may include:

- Modify array fence height to be as low as possible while adhering to safety standards
- Avoid using barbed wire on top of the fences except when surrounding substations
- Utilize wildlife permeable fencing (which must be defined) around all solar arrays, or arrays adjacent to wetlands, waterways and wildlife habitats. Options include:
    - Raise the fence a minimum of 6-8 inches off the ground; preferred because it allows passage of small and medium-sized wildlife under the fence

    - Ensure that the openings at the bottom of the fence are a minimum of 8 inches tall by 12 inches wide
- Provide ramps along the inside of the fence at regular intervals for larger wildlife if frequent entrapment is occurring
- Incorporate habitat enhancement practices like diverse native plantings, reduced light at night for nocturnal insects or bird houses
- Increase fence visibility in key bird areas by using appropriate markers or fencing tapes to avoid bird collisions

Standard to address	**Most Favorable Language Found** (Contract, section number)	**How language benefits local governments and communities**	**State Statutes/BMP Recommendations**	**Unanswered Questions in Existing Contract Language**
Roadway Fencing Setbacks	Fencing shall be a minimum of 40 yards from the traveled portion of the roadway or a distance shorter if needed by the developer to maintain operation. (Vista Sands, 6.e.6)	40 yards is larger than most setback requirements. Lesser road setbacks may result in an increase in large mammal-vehicle collisions, especially when fences are on both sides of a road.		Does the developer need to provide evidence of the need to input shorter setback distances?
Fence specifications • Height • Gap at bottom	Seven-foot-high deer exclusion fencing. The deer exclusion fencing shall also facilitate small wildlife passage via ground-level openings with at least a six-inch gap between the bottom of the fence and ground. (Vista Sands, 6.e.1)	Gap between fence and ground facilitates small wildlife passage.		

Fencing Composition	Other than the fencing directly surrounding the Project substation, O&M, and BESS, the Project's perimeter fencing shall consist of "deer fencing" (wire mesh), which can be described in greater detail as a six- to ten-foot-tall woven wire partition with wooden posts. (Darien, 2) (BESS-Battery Energy Storage System)	Specifies what materials fencing will be built from. No barbed wire at the top of the fence.		
Wildlife corridors	Developer shall divide large parcels (320 acres or greater) into smaller (160 acres or less) fenced sub-parcels to establish unfenced corridors for wildlife and other uses. (Vista Sands, 6.e.5)			
Wildlife corridors and fish habitat • Navigable Waterway Setbacks	No above ground equipment or fence shall be located within 75 feet of a navigable waterway unless a greater distance is required. (Vista Sands, 6.e.3)	Clarifies that fences must meet waterway setback, as well as panels and inverters. Larger setbacks reduce land disturbance and potential erosion into	NR 115.05(1)(b) requires a 75-foot setback from navigable waters for all buildings and structures; "structure" is defined in 59.692(1)(e), Wis.	Will the developer establish a greater setback distance in sensitive areas? Do roads need to meet the waterway setback?

		streams. This language allows for the possibility of certain stretches or key areas could have larger setbacks.	Stats.; setbacks are measured from the ordinary high-water mark	
Wildlife corridors and fish habitat • Non-Navigable Waterway Setbacks	If (streams are) not deemed "navigable", a minimum twenty-foot setback will be maintained to all above ground project components. (Badger State, 6.a.2)	Non-navigable streams (which are small and sometimes flowing mainly in spring and after large storms) often flow into larger streams affecting fish, fish habitat, and water quality. Explicit mention of a setback for any non-navigable waterways helps protect crucial habitat for fish and wildlife that need shoreline access.		

17. Visual concerns and buffers for neighboring landowners

Explanation: Aesthetic concerns related to solar projects typically include the setback distance and visual screening of the project from nearby landowners and roads that typically includes maintaining existing trees/vegetation for screening, planting new vegetation, which takes years to fill in, and/or berms. These standards can be addressed in solar contracts with local governments to achieve consistency between neighboring landowners or through contracts with individual landowners.

Standard to address	Most Favorable Language Found	How language benefits local governments and communities	State Statutes/BMP Recommendations	Unanswered Questions in Existing Contract Language
Setback from residences	Solar arrays have a150-foot setback from any non-participating landowner. (Paris, 16) For non-participating landowners whose property is bounded on two or more sides by property owned by a participating landowner on which the final design will include above ground components (excluding fences and access roads), the Project's design shall incorporate a minimum 200 foot setback to all above ground project components from the non-participating landowner's residence. Badger State, 11)	Provides a consistent and measurable setback from residences.		
Setback from non-participating property lines	50 feet (Paris, 16)	Provides a consistent and measurable setback from property lines.		

Setback from participating landowners	For adjoining participating landowners, the setback requirement may be established pursuant to mutual agreement between Project Owner and participating property owners. (Darien, 22)	Provides flexibility for landowners leasing land to the solar developer.		
Neighboring Visual Buffer	If a section of trees are destroyed and are pivotal in preventing view of the array, the developer will work with the town to establish a plan to replace the trees in the area paid by the developer. (Wood County, 13)	Developer funded plan that would replace existing vegetative buffers. These may have served as wind breaks that could also reduce erosion.		
Neighboring Visual Buffer	For non-participating landowners whose property abuts the project the developer shall make a good faith effort to address aesthetic concerns raised. Good faith efforts shall include meeting with the landowner to discuss mitigation practices. (Maple Grove, 7.e)	Establishes good faith with neighboring properties. Meetings with landowners can reduce complaints made regarding the project.		

Neighboring Visual Buffer	Project Owner shall contact every owner of residential property immediately adjacent to solar arrays and discuss in good faith a reasonable, strategically-located visual buffer of plants that, upon mutual agreement, shall be installed at developer's expense prior to the completion of construction of the Project. (Paris Solar, 15)	Thoroughness for every adjacent landowner ensures that none are overlooked if project owner doesn't deem their property necessary for installation of a buffer.		
Neighboring Visual Buffer	Project Owner shall contact every owner of residential property immediately adjacent to solar arrays and discuss in good faith a reasonable, strategically-located visual buffer of plants that, upon mutual agreement, shall be installed at Project Owner's expense prior to the completion of construction of the Project. Where the Project Owner and the adjacent property owner are unable to agree on the type	Contact adjacent landowner about visual buffers; perhaps provides flexibility in plantings. Vegetative buffers will be installed with opacity standard.		What vegetation and what size will be installed?

	of visual buffer and the adjacent property owner makes a request in writing to Project Owner to provide a visual buffer, the Project owner shall install a vegetative buffer on the Project site equal to the length of the non-participating residence and designed to achieve at least 50% opacity at ground level within 5 years. (Paris, 15))			
Repair of Fencing	Impairments to either the woven wire or wooden posts that are aesthetically unpleasing shall be remedied within two weeks of written notification. "Leaning" of the fence shall not be allowed to exceed plus or minus 10 degrees of perpendicular. In the event leaning or tilting of the fence does occur, it will be corrected back to perpendicular within two weeks of receiving written notice on the issue. (Paris, 4)	A timeline of remedy regarding issues in fencing is established. The process for filing to request the remedy to the fencing is also outlined.		

18. Noise Impacts

Explanation: Noise is unwanted and/or harmful sound, first recognized as a public health hazard in 1968. In general, noise from solar power generation facilities is not a significant problem but should be considered when designing and permitting a solar project. The primary sources of noise in a solar power generation facility are the inverters and the substation transformers, although if a Battery Energy Storage System (BESS) is included in the project, it could also be a significant source of sound.

Noise levels are typically much higher during construction of a solar project than during operation. Pay particular attention to the proximity of laydown yards to homes. Laydown yards are designated areas on or near a solar construction site used for the receipt, storage, and staging of equipment, materials, and vehicles. They also serve as central hubs during the construction, operation, maintenance, and decommissioning phases. Construction noises include pile drivers at 75 dBA, and bulldozers at 85 dBA.

Based on a simplified analysis, central inverters should be located at least 147 feet away from neighboring properties to remain below 55 dBA during the day, while substation transformers should be located at least 196 feet away to remain below 45 dBA at night. If the layout of a particular project prevents these distances from being observed, other sound mitigation measures, such as sound barriers can be employed.

Chronic noise, even at low levels, can cause annoyance, sleep disruption, and stress that contribute to cardiovascular disease, cerebrovascular disease, metabolic disturbances, exacerbation of psychological disorders, and premature mortality.

Standard to address	**Most Favorable Language Found** (Contract, section number)	**How language benefits local governments and communities**	**State Statutes/BMP Recommendations**	**Unanswered Questions in Existing Contract Language**
Maximum noise levels	The Project's inverters and substation, which constitute noise emitting equipment from the solar facility, shall not exceed the PSCW mandated maximum	May reduce long-term noise levels that negatively impact human health.	Wis. Admin. Code § PSC 128.14 that applies to wind energy is often used for solar noise limits as well. This code states: noise	

	nighttime sound level of 45 A-weighted decibels (dBA), nor the maximum daytime sound level of 50 dBA, at the walls of the noise-sensitive receptors, hereby identified as the single-family residences within proximity of the Project. Additionally, the Project will meet the daytime sound standard thresholds at the Project's boundaries, as set forth in Jefferson County's Ordinances, currently in effect. (Badger State, 6.b.2)		attributable to the wind energy system does not exceed 50 dBA during daytime hours and 45 dBA during nighttime hours.	
Construction hours	Hours of construction will be between 7:00 a.m. and 7:00 p.m., Monday through Saturday, and between 10:00 a.m. and 7:00 p.m. on Sunday. (Badger State, 6.b.3)	Limits construction noise at night.		

19. Lighting and Glare

Explanation: Solar projects often install lighting for security reasons. Lighting can have negative impacts on neighbors, birds and insects for the life of the project. Pay particular attention to the proximity of substations and laydown yards to homes, as they typically have more lighting. Laydown yards are designated areas on or near a solar construction site used for the receipt, storage,

and staging of equipment, materials, and vehicles. They also serve as central hubs during the construction, operation, maintenance, and decommissioning phases. Simple standards described below can lessen lighting impacts.

Glare from solar panels is problematic if it impacts drivers on roadways. Glare studies can pinpoint which sections of roads are affected at what times of day and panel rotation can be adjusted for the solar panels that would otherwise cause the glare.

Standard to address	**Most Favorable Language Found** (Contract, section number)	**How language benefits local governments and communities**	**State Statutes/BMP Recommendations**	**Unanswered Questions in Existing Contract Language**
Solar Panel Glare	To reduce the glare of panels facing road or residential structures the rotation of panels will be limited to no greater than 60 degrees from horizontal unless a different position is required for project safety (Vista Sands, 6.g-j)	Protects roadways from glare issues.		
General Lighting	Lighting during and after construction shall be minimal allowed for safe and secure maintenance. Light shrouding shall be used to limit light leaving the premises. (Wood County, 14)	Light shrouding helps keep light from penetrating to other properties.		Proposed language that is more comprehensive: All lighting shall be dark-sky compliant, downcast and fully shielded so as not to shine onto the road or neighboring properties.
General Lighting	Necessary lighting to provide safety and security	Agrees to follow local governments' municipal		

	of facilities shall meet the lighting requirements of Chapter 12.18.8-1, Municipal Code of Kenosha County. Project Owner will provide the Town with a description of permanent Project lighting plans when available. (Paris Solar, 15)	code. Also agrees to provide the town with lighting plans allowing for interjection ahead if necessary.		

20. Public safety and emergency management

Explanation: Potential emergencies at solar projects may include wildfires, electrical and battery fires and floods. Local fire fighters and emergency management staff (EMS) need the following information and training on the same:

- Emergency Response Plan which will outline the chain of command during an emergency incident including a communication plan detailing how the proposed project will communicate information about an incident to the local fire department.
- Hazard Mitigation Analysis including site maps identifying the locations of potential hazards such as high voltage areas, battery, chemical and fuel storage areas, and floodplain maps.
- Establish Emergency Response Numbers (address points) and install the address signs for each of them for the needs of first responders; by doing this, they become part of the 911 system so EMS can find the relevant location.
- On-site training for emergency management staff is needed to provide project and facility familiarization and establish communication channels

Standard to address	**Most Favorable Language Found** (Contract, section number)	**How language benefits local governments and communities**	**State Statutes/BMP Recommendations**	**Unanswered Questions in Existing Contract Language**

Onsite meeting with emergency responders, emergency action plans and site maps	At least thirty days prior to the start of construction, Developer will hold an onsite meeting inviting local emergency responders to discuss the construction site specific emergency action plan, emergency response information such as meeting points and locations of emergency equipment, and construction plans. As available, written copies of emergency action plans and site maps will be provided to local emergency responders. (Elk Creek, 1.)			
Public Safety	Project Owner will require that all contractors on the site during construction meet all state, federal and industry best practice standards for employee and public safety. (Invenergy, Badger Hollow, 11.)			How is this checked and enforced?
Emergency Response	Project Owner intends to request meetings with site area Emergency Response	Positive if Project Owner arranges meetings with Emergency Response		

	agencies to provide project and facility familiarization and establish communication channels. Should any aspect of the Project construction or operations present unfamiliar equipment or situations for responders, Project Owner will arrange for adequate professional training to deal with those concerns. (Invenergy, Badger Hollow, 11.)	agencies. The term "intends" does not ensure meetings will happen. Provides professional training to deal with concerns.		
Emergency Response Plan	Project Owner shall develop an Emergency Response Plan (ERP) that deals with the construction phase and an ERP for the operation phase of the Project. These plans shall include training for local fire and EMS, and shall include locations of on-site emergency equipment, such as AEDs and fire extinguishers. Copies of these plans shall be distributed to County and			When will the Emergency Response Plan be distributed to local EMS providers? The sooner the better so that local officials and EMS know the details of what their role will be.

	local emergency services. (High Noon, 15.)			
Emergency Response Numbers = address points	Project Owner shall apply for Emergency Response Numbers (ERNs), approval of which shall not be unreasonably held. The specific location and number of ERNs necessary shall be discussed with local public safety officials, including consultation with County Sheriff's Department, and local fire and EMS. (High Noon, 15.)	EMS can find the relevant location when needed.		
First Responder Communication System Complaints	Project Owner agrees to cooperate with County Emergency Management to investigate complaints of radio system operations or quality problems in or near the Facilities. If the Facilities are shown to cause interference with normal operations of emergency service radio systems, Project Owner will cooperate with County Emergency Management to select a qualified contractor	Project owner is responsible for coordinating any issues and funding any costs associated with correction to the problem		

	to identify specific interference remedies. County Emergency Management and Project Owner will cooperatively select a qualified contractor acceptable to both parties to perform necessary interference remedial work. Project Owner will be responsible for all reasonable costs associated with complaint investigation and correction by outside parties. (Invenergy, Badger Hollow, 12.)			

21. Battery energy storage systems

Explanation: Solar projects are currently often paired with a Battery Energy Storage Systems (BESS). While we have not noted solar contract language on this topic, the Columbia County Zoning Ordinance provides the following standards:

Battery Energy Storage System. If battery energy storage systems are included in solar or other projects, the following considerations shall be made by the owner/operator:

- Setbacks from residential, business, municipal, school, or town structures, and public and private drinking water systems. A committee-identified minimum goal of 1,500 feet from residential, business, municipal, school, or town structures and minimum 1,000 feet from a drinking water system is desired. Note: Consider larger setbacks from drinking water systems in areas with high susceptibility to groundwater contamination. Lateral groundwater

movement in heavy soils is slow. In sandy soils, lateral movement can be up to three feet per day. Wisconsin Groundwater Contamination Susceptibility Map

- Separate containment enclosures that include the following goals:
  - Enclosure size capacity containment of 150% of the battery energy storage system.
  - Sufficient fireproofing for connecting electronic wires, protecting from one structure to the next and from the battery energy storage system to the substation.

22. Cooperation

Explanation: Contracts often include a cooperation section similar to:

- Developer and the Local Governments shall communicate and cooperate in good faith concerning the safe construction, operation, and decommissioning of the Project and preventing or correcting any adverse conditions that may be created by the Project. (Apple River, 9)

If a local government wants to express concerns with a solar project proposal, avoid contract language that limits the ability to communicate their concerns, as this language does:

- Developer and the local governments shall communicate and cooperate in good faith…The local governments agree to not oppose the Project in all federal and state permitting processes related to the project. "Not oppose" means to refrain from actively intervening in opposition of the project, to withdraw from any pending permitting proceeding (including PSCW proceedings), of filing non-supportive comments in such proceeding. (Vista Sands, 13)

23. Professional fee reimbursement

Explanation: Local governments often incur a number of professional expenses when responding to a solar project proposal including professional fees for services from legal, engineering, environmental and other experts related to the project. The language below states that incurred costs are reimbursed. The local government may also incur expenses for additional local government printing, mailings, signage and meetings.

Standard to address	Most Favorable Language Found (Contract, section number)	How language benefits local governments and communities	State Statutes/BMP Recommendations	Unanswered Questions in Existing Contract Language
Professional fees	Developer, within 45 days of the execution of this Agreement by the last of each and every Party, and upon receipt of invoice, shall reimburse the local governments their reasonable professional expenses incurred in reviewing, revising and negotiating this agreement and in participation in the CPCN proceedings at the PSCW, to a maximum total amount of $75,000. (Vista Sands Solar, 8)	May avoid placing expenses related to the solar project on the local governments.		What if not all parties (local governments) execute the agreement? Do the local governments who did sign the agreement get reimbursed? Are expenses for printing, mailings, signage and meetings related to the project covered?

24. Establishing lines of communication, compliance and enforcement

Explanation: Compliance checks and enforcement are often left to local governments where the project is located. Developing relationships between the solar developer and local governments up front and establishing primary contacts and a regular schedule (monthly) of ongoing meetings are key.

Monitoring the solar project construction and operation for compliance and enforcing contract provisions when necessary can take a significant amount of time and a local government may or may not have an employee or official to do monitoring. An alternative is to hire a third-party inspector to monitor and enforce the contract provisions, perhaps using a portion of the utility aid payments when they become available. If no penalties are included for noncompliance, it may be difficult for local governments to get compliance

with the contract. Meaningful penalties can encourage solar developers and their contractors to operate in compliance with the solar contract.

Standard to address	**Most Favorable Language Found** (Contract, section number)	**How language benefits local governments and communities**	**State Statutes/BMP Recommendations**	**Unanswered Questions in Existing Contract Language**
Pre-Construction meeting	At least 60 days prior to the start of Project construction, Project Owner shall meet (the "pre-construction meeting"_ with the Local Governments' officials responsible for roads and drainage and local emergency responders to present final plans for use of public roads, location of equipment laydown yards, finalize construction scheduling, discuss safety practices, and coordinate local emergency response capabilities, as well as vegetation management, compaction mitigation, stormwater management and erosion control planning, engineering	Helps start a relationship, develop lines of communication including identifying main contacts, provides information on construction timing.		Identify solar developer project contact with a phone number and email address so it is clear who to contact with questions and complaints.

	layouts, and general Project characteristics. ... (Darien, 3)			
Regularly scheduled calls and/or onsite visits	None.	Maintain communication and get regular updates on the project during and after construction. Monthly scheduled calls have been helpful. Regular onsite visits to view the project by driving through the sites with developer and construction staff.		
Compliance and Complaint Process	Developer shall identify a Project contact to the Local Governments on its behalf, for compliance and complaints, if any. During construction, the construction site manager of the engineering procurement and construction ("EPC") firm selected by Developer will be designated as the Project	Ensures that local governments know specifically who to reach out to with any concerns prior to construction, during construction and after construction.		Describe how complaints will be handled and how local governments will be made aware of complaints and how and when they are addressed by the developer/operations team.

	contact, under Section 5(a) above. The selected EPC firm shall be contractually obligated to Developer to abide by the applicable permit requirements. After construction completion, Project's full-time operations team will be its Project contact. Complaints shall be submitted through the project website and the Local Governments will be provided with operation team's contact information. (Badger State, 1.)			
Annual reports	Recommended language, not yet included in a contract: Solar project shall submit a report yearly to the local governments on or before March 31 that summarizes the prior year. The report shall include, but not be limited to, the status of the project, total MW online, net book value of any storage facilities, projects or activities from the prior year,	Maintain communication and current knowledge of project.		

	goals and planned projects for the upcoming year and an update or review of the decommissioning plan.			

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We sincerely thank our reviewers for contributing their time and expertise:

- Jim Garbe, Town of Plover Chairman
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Resources:

Wisconsin Department of Natural Resources Best Management Practices for Solar Energy Projects. November 2025. https://dnr.wisconsin.gov/sites/default/files/topic/Sectors/Solar_BMPs_FINAL_November_2025.pdf The authors drew from this document extensively.

An Examination of Local Ordinances for Wetland Protection by Anna Haines and Matt Zangl, 2015. https://www3.uwsp.edu/cnr-ap/clue/Documents/Zoning/Inventory_Report.pdf

Wisconsin Department of Natural Resources Wetland Functional Values. https://dnr.wisconsin.gov/standard/Wetlands/function.html

Little prairie under the panel: testing native pollinator habitat seed mix establishment at three utility-scale solar sites in Minnesota by James McCall et al. 2024, Environmental Research Communications, 6: 075012, Table 1 provides percentage of forbs in seeding mixes.

https://iopscience.iop.org/article/10.1088/2515-7620/ad5b3c Supplementary data for the study includes 20 native species that were observed most often in year 3 after planting (Table SI-5); download at https://iopscience.iop.org/article/10.1088/2515-7620/ad5b3c/data

If you build it, will they come? Insect community responses to habitat establishment at solar energy facilities in Minnesota, USA by Leroy J Walston et al., 2023, Environmental Research Letters, 19: 014053. https://iopscience.iop.org/article/10.1088/1748-9326/ad0f72

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