

Memorandum

To: Stillwater Township Town Board	Project Reference: Solar Energy Systems Zoning Ordinance Amendment Request
Copies To: Barbara Riehle, Clerk	
Ken Valley, Applicant	
From: CJ Sycks, Planner	TKDA Project No.: 21103.0000
Evan Monson, Planner	Client No.:
Date: December 18, 2024	

SUBJECT: A request to amend the Solar Energy System Requirements in the Township Zoning Ordinance

MEETING DATE: January 9, 2025

APPLICANT: Ken Valley – EPF Solar LLC, on behalf of Michael J. Raleigh

REVIEW PERIOD: 60-day review period ends 1/11/2025

ITEMS REVIEWED: Submittals received on 10/31/2024, fees received on 11/12/2024

OVERVIEW

In November, the applicant inquired about erecting a “Dual-Axis Tracker” system on a property within the Township – 9421 Pawnee Avenue North. The property owner had received a building permit for a similar system in February 2019. Following conversations with staff, it was determined that the current definitions in the Zoning Ordinance did not include this type of structure, and that this type of system does not meet the current regulations for a “ground-mounted” solar energy system. To allow this type of solar energy system, planning staff suggested the applicant pursue a zoning ordinance amendment request.

While the applicant inquired initially about a specific property, this is a request to amend the Zoning Ordinance language to allow Dual-Axis Trackers as a use, not to erect a Dual-Axis Tracker at 9421 Pawnee Avenue North. The Planning Commission reviewed this request on December 5th, 2024. Their recommendation is included in this report.

The Town Board reviewed the request on December 12th, 2024. The Board tabled the request to allow the applicant to attend the meeting and provide context and answer any additional questions.

A dual-axis tracker is a type of solar energy system that pivots on two axes to capture sunlight as the sun rises and sets, capturing more energy than a ground-mounted system. These trackers are taller than the typical solar panels you see in fields or on rooftops. The height allows the tracker to capture sunlight for a longer period each day. A 26-foot x 30-foot array is typical and can harness up to 15 kw each. They create a quiet clicking sound around every ten minutes as the panel rotates. Dual-axis trackers are significantly more expensive than ground-mounted systems and require more continued maintenance for the small motor and internal electrical components. They have a lifespan of around 25 years.

The applicant is requesting an amendment to the definitions in Chapter One, Part 1, Section 2.1, as well as the Solar Energy Systems (SES) regulations in Chapter Two, Part 3, Section 2.22. The request includes the following elements:

1. Add a definition for Dual-Axis Trackers.
2. Add dual-axis trackers as a permitted use.
3. Add dual-axis trackers (up to three per property) as an option for accessory solar energy systems.
4. Do not require 8-foot-tall fencing around dual-axis tracker solar installations.

5. Do not require that all systems shall be screened from view from public right-of-way and adjacent properties.
6. Propose a new height limit for dual axis trackers.
7. Propose a restriction within residential neighborhoods.

As required by Zoning Ordinance Chapter One, Section 13, any amendment to the Zoning Ordinance must be reviewed by the Planning Commission with a public hearing, study, report, and recommendation. Following review and recommendation by the Planning Commission, the Town Board will review and approve or deny the request.



Figure 1: Image of a Dual-axis Tracker, provided by the applicant.

CURRENT ZONING ORDINANCE REGULATIONS

Definitions (Chapter One, Part 1, Section 2.1)

The Township Zoning Ordinance was first amended in 2018 to allow solar energy systems (SES). The Township Zoning Ordinance includes nine definitions pertaining to solar energy, and there are two types of solar energy collector structures defined: Roof-Mounted and Ground-Mounted.

An SES is defined as “A device or structural design feature, a substantial purpose of which is to provide daylight for interior lighting, or provide for the collection, storage, and distribution of solar energy for space heating, cooling, electrical generation, or water heating.”

A Roof- or Building-Mounted SES is defined as “A solar energy system (typically panels) that are mounted on the roof or building using brackets, stands or other apparatus.”

Solar Energy Systems (SES), Accessory (Chapter Two, Part 3, Section 2.22)

SES are permitted as an accessory use to agriculture and residential uses in all zoning districts. It must provide energy for the structures that are on the property which it is located. All SES require a building permit. Below are some of the standards for ground-mounted SES.

1. Standards for all SES
 - c. “Solar Panel Glare. All SES shall be designed and located in order to prevent reflective glare toward any inhabited buildings on adjacent properties, as well as adjacent street rights-of-way. Steps to control nuisance glare may include selective placement of the system, screening on the side of the solar array facing the reflectors, reducing use of the reflector system, or other remedies that limit glare.”

- e. "Safety Measures. A clearly-visible warning sign concerning voltage must be placed at the base of all pad-mounted transformers and substations. All mechanical equipment, including any structure for batteries or storage cells, shall be completely enclosed by a minimum eight (8) foot high fence with a self-locking gate, and provided with screening in accordance with the screen and landscaping provisions of this Development Code."
3. Ground-Mounted SES
 - a) "One Ground-mounted SES with a footprint area up to a maximum eight hundred (800) square feet is allowed as an accessory use in all zoning districts. A ground-mounted SES with a footprint that exceeds eight hundred (800) square feet may be permitted as an accessory use to an agricultural use on a parcel that is larger than twenty (20) acres in size and shall require a conditional use permit."
 - b) "One Ground-mounted SES is excluded from the size and number limitations for accessory structures permitted by this Zoning Ordinance."
 - c) "Ground-mounted SES are excluded from the lot coverage requirements of the Zoning Ordinance if the area under the SES is permanently vegetated."
 - d) "Ground-mounted SES shall not exceed fifteen (15) feet in height when oriented at maximum tilt."
 - e) "Ground-mounted SES shall comply with the required Accessory Structure setbacks in this Ordinance (Chapter 2, Part 3, Section 1.2). If a Variance is granted to permit Ground-mounted SES in a front yard, it shall be screened from view from the public right of way and adjacent properties. Screening may be accomplished by using setbacks, berming, existing vegetation, landscaping, or a combination thereof."

Accessory Structures/Attached Garages (Chapter Two, Part 3, Section 1.2)

Ground-mounted SES shall comply with the Accessory Structure setbacks. Below are the Accessory Structure Setback requirements.

- (2)(B)1: "The setbacks required in the zoning district must be met."
- (2)(C): "No detached accessory structure shall be located closer to the road right-of-way than the principal building on a lot without obtaining a Variance, unless all of the following conditions are met:
 1. The structure is a small structure (twenty-five [25] square feet or less) used to shelter children waiting for school buses, if all setbacks are met.
 2. The accessory structures are located at least two hundred (200) feet from the road right-of-way on lots of five (5) acres or larger and meeting all setback requirements.
 3. Township screening policies are applied, where appropriate."

Zoning District Setbacks (Chapter Two, Part 2, Section 2.1)

Accessory structures follow the setbacks of the zoning districts. In the Agricultural (AG) and Saint Croix River (SCR) districts the minimum building setbacks are as follows:

- Front: 40 feet
- Side: 20 feet
- Rear: 50 feet
- The minimum setback for all structures shall be one hundred fifty (150) feet from the centerline, or 75 feet from the right-of-way (whichever is greater), along roads designated as "Arterials" in the Township's Comprehensive Plan.

THE REQUEST

Below is an explanation of each requested amendment as proposed by the applicant. **Proposed ordinance language is in red.**

1. Add a definition for Dual-Axis Trackers.

The applicant states that the current Zoning Ordinance uses the verbiage ground mount and pole mount interchangeably, since at the time of adoption, that's what was available and understood. The applicant states that Dual-Axis and Single-Axis Trackers are single pole mounted and should be within their own category. They

cite that these systems are a good alternative due to the small amount of land used (~7.065 feet), they allow for free movement of animals and would not require a chain fence due to the height.

“Solar Energy, Dual-Axis Tracker: A freestanding solar system that tracks the sun in two different axes using two pivot points to rotate, mounted directly to the ground using a single pole.”

“Solar-Energy System, Ground-Mounted: A fixed, freestanding solar system mounted directly to the ground using a rack, pole, or stabilizers or similar apparatus rather than being mounted on a building.”

2. Add dual-axis trackers as a permitted use.

The current Zoning Ordinance (Chapter Two, Part 1, Section 5, Table of Uses) permits SES in each zoning district. The applicant is proposing to include dual-axis trackers in this use. The applicant states that this should be allowed to allow for property owners to offset their onsite energy usage.

“Solar Energy Systems (as a residential or agricultural accessory use; dual-axis trackers, roof-mounted, building-integrated, passive, or ground-mounted up to 800 square feet [footprint])”.

3. Add dual-axis trackers (up to three per property) as an option for accessory solar energy systems.

The applicant is proposing the Township permit up to three dual-axis trackers per property, and to restrict energy collection to 40kw AC, which is compliant with utility rules. The applicant states that, due to the high cost of these structures, there would likely never be an entire field of them erected. Currently, only one ground-mounted system is permitted per property. It is proposed that dual-axis tracker SES should comply with zoning district setbacks.

The Township has a few options for how to restrict the number of these systems. The Township may limit by a single number of structures, by the amount of energy collected, or by the number of structures based on property acreage.



Images of Dual-Axis Trackers, provided by the applicant.

4. Do not require 8-foot-tall fencing around dual-axis tracker solar installations.

The applicant is proposing to amend clause 2.22 (2)(D)1. e) to remove, “All mechanical equipment, including any structure for batteries or storage cells, shall be completely enclosed by a minimum eight (8) foot high fence with a self-locking gate...”. The applicant states that this is reasonable, since Minnesota State law does not require fencing or hardware cloth for any array higher than 8’ from the ground level. The base of the array of a dual-axis tracker is typically 8’-14’ from the ground. There are no reachable wires or equipment, since it runs within the pole of the structure.

“Dual-axis tracker SES are exempt from requiring an enclosed fence.”

5. *Do not require that all systems shall be screened from view from public right-of-way and adjacent properties.*

Subsection (D)3. e) includes the phrase, “If a Variance is granted to permit Ground-mounted SES in a front yard, it shall be screened from view from the public right of way and adjacent properties. Screening may be accomplished by using setbacks, berming, existing vegetation, landscaping, or a combination thereof.” The applicant states that screening a dual-axis tracker would be impossible. These types of structures allow for continual usage of the property that was used prior to installation, due to the small footprint.

6. *Propose a new height limit for dual axis trackers.*

The applicant is proposing a maximum height of 36 feet at maximum tilt for dual-axis trackers. They explain that during maximum tilt during winter months, the maximum height gets to 36 feet. At night they remain in a flat position at 21 feet. Shading is minimal, except during the winter season when the sun is close to the horizon. They go into flat position if winds are greater than 25 miles per hour.

7. *Propose a restriction within residential neighborhoods.*

The applicant states that to prevent shading on neighboring properties, dual-axis trackers should not be placed in residential neighborhoods. The applicant suggests having a minimum acreage of 1 acre or requiring they be placed along a tree line, not noticeable by neighbors.

4. “Dual-Axis Trackers

- a) **No more than three (3) dual-axis trackers are permitted as an accessory use in all zoning districts.**
- b) **Dual-axis trackers are excluded from the size and number limitations for accessory structures permitted by this Zoning Ordinance.**
- c) **Dual-axis trackers are excluded from the lot coverage requirements of the Zoning Ordinance if the area under the SES is permanently vegetated.**
- d) **Dual-axis trackers shall not exceed thirty-six (36) feet in height when oriented at maximum tilt.**
- e) **Dual-axis trackers shall comply with the required Accessory Structure setbacks in this Ordinance (Chapter 2, Part #, Section 1.2).**
- f) **Dual-axis trackers are prohibited on lots less than 1 acre in size. For lots less than 5 acres in size, dual-axis trackers should be erected along a tree line and out of sight from adjacent properties, when possible.”**

2040 STILLWATER TOWNSHIP COMPREHENSIVE PLAN

In Chapter Two, Section F, Special Resources: *Solar and Aggregate*, the Comprehensive Plan addresses solar energy systems. Below are excerpts from the 2040 Plan.

Solar Access Protection. In Stillwater Township, solar access is protected by the Township's minimum lot size requirement (1 housing unit per 10 acres), setback requirements, and maximum building height standard (35 feet). The Township's zoning ordinance includes a requirement that all variances must protect solar access on adjacent parcels as a condition of approval.

Solar Access Protection and Alternative Energy Sources Goals:

- *Assure adequate solar access for Township residents and permit the use of accessory alternative energy systems including solar energy systems, wind energy conversion systems, and geothermal systems.*

Solar Access Protection and Alternative Energy Sources Policies:

- *The Township's Zoning Ordinance will continue to ensure Solar Access Protection by maintaining minimum lot sizes, setback requirements, and its maximum height standard. The Ordinance will continue to require that approved variances maintain solar access for surrounding properties.*

- *The Township's Zoning Ordinance permits the use of alternative energy sources such as solar systems, wind energy conversions systems, and geothermal systems as accessory uses and includes standards for these uses that apply in all zoning and overlay districts.*

Planning staff find the request to be consistent with the Comprehensive Plan's goal to ensure adequate solar access for residents. The proposed language is consistent with the policies of ensuring there are property requirements and permitting alternative energy sources in all districts. It does not, however, *require* the Township to allow *all* types of SES.

PLANNING COMMISSION REVIEW

The Planning Commission reviewed this request on 12/05/2024. The Commission discussed the negative visual impacts these trackers may have on the community if allowed at a maximum height of 36 feet, the need for innovation and progress for solar energy collection, the potential for permitting dual-axis trackers as a conditional use, and whether the request is in alignment with the Township's Vision Statement and 2040 Comprehensive Plan.

ACTION

The Town Board has the following options:

1. Approve of the amendments to the Township Zoning Ordinance, with or without changes.
 - a. If recommending approval of the amendments, the Commissioners should discuss any recommended changes.
2. Deny the amendments to the Township Zoning Ordinance, with findings for denial.
3. Table the request for further review and study.
 - a. If the request is tabled, a 60-day review period extension must be granted.

RECOMMENDATION

The Planning Commission recommended denial of the request to amend the Township Zoning Ordinance to add Dual-Axis Trackers as a new use, with the following findings:

- The height and size of Dual-Axis Trackers are not in accordance with the Township's Vision statement, to protect views and vistas.
- The Township Zoning Ordinance is currently consistent with the goals of the Comprehensive Plan, by permitting ground-mounted and building-mounted solar energy systems in all districts, without needing to expand the methods of solar energy collection.

The Board should discuss the proposed amendment and determine if expanding the methods of solar energy collection to include dual-axis trackers is consistent with the intent of the Township Zoning Ordinance and 2040 Comprehensive Plan.