



NORTHWEST ASSOCIATED CONSULTANTS, INC.

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MEMORANDUM

TO: Sunfish Lake City Council

FROM: Michelle Barness

DATE: March 30, 2016

RE: Sunfish Lake – Alternative Energy System Ordinance – Conditional Use Requirements for Ground Mounted Solar Energy Systems

FILE: 211.02

**4/5/16 CC
Mtg.
Agenda
Item 6b**

BACKGROUND AND ANALYSIS

At the March 2, 2016 meeting the City Council reviewed the draft alternative energy system ordinance and heard from Brian Ross of the Great Plains Institute for Sustainable Development regarding the function and regulation of solar energy systems. After the discussion Council directed staff to research the option of permitting ground mounted solar energy systems by conditional use permit, while roof mounted solar energy systems would remain a permitted accessory use as provided for in the current draft ordinance.

In response to the Council's request staff reviewed alternative energy ordinances in several Minnesota communities, including Woodbury, Roseville, Eden Prairie, Afton, Elko New Market, Minneapolis, St. Paul, Spring Park, Inver Grove Heights and Mendota Heights. Permitting ground mounted solar installations by conditional use was not a regulatory approach taken by the majority of communities reviewed. Most communities allowed all solar energy systems as accessory uses as long as identified standards are met and a building permit is attained. However the City of Mendota Heights was found to regulate all solar energy systems as a conditional use. The requirements the Mendota Heights ordinance lists for conditional solar energy systems are very similar to what is already provided in Sunfish Lake's draft alternative energy ordinance, but with the conditional use requirement Mendota Heights has the opportunity to review individual solar projects against the requirements of the ordinance.

Based on this research staff has not significantly revised regulations for ground mounted solar energy systems, but rather has amended the current draft alternative energy ordinance to require these systems as a conditional use, which will then permit the City the opportunity to examine specific projects in details for issues pertaining to

setbacks, screening requirements, and so on. Two specific changes you will notice to the requirements for conditional ground mounted solar energy systems are as follows:

- 1) The permitted height for conditional ground mounted solar energy systems has been reduced down from 16 feet to 12 feet in all zoning districts. Twelve feet is the current accessory height limitation for accessory structures in the Shoreland Overlay District.
- 2) A regulation for the location of ground mounted systems was incorporated to state that these systems are not permitted in front yards. The systems will otherwise be required to meet all applicable accessory setback requirements for the zoning district.

Other changes to the draft ordinance necessary to clarify approvals and applicable standards for the different alternative energy systems included:

- 1) Revising the “Zoning District Allowance” section to specify that roof mounted solar energy systems are accessory uses in all districts, while ground mounted systems are conditional uses in all districts.
- 2) Adding an “Approvals Required” section specifically stating whether just a building permit is required (in the case of ground source heat pump and roof mounted solar energy systems), or whether a building permit and a conditional use permit will be required (in the case of ground mounted solar energy systems).
- 3) Revising the ordinance formatting to provide a “General Provisions” section for standards that are required to be applied to all solar energy systems, and adding individual standards sections for either accessory roof mounted systems or conditional ground mounted systems.
- 4) Adding an amendment to the zoning districts to specify that roof mounted solar energy systems are permitted accessory uses, while ground mounted solar energy systems are conditional uses.

CONCLUSION

Please review the final draft version of the alternative energy system ordinance with the conditional use requirements for ground mounted solar energy systems incorporated. If Council finds the draft ordinance to be complete and satisfactory with regards to regulating ground source heat pump, roof mounted and ground mounted solar energy systems, planning staff will finalize changes in April and post a public hearing notice for final review of the draft ordinance at the May 3, 2016 City Council meeting.

Attachments: Mendota Heights Alternative Energy Ordinance
Sunfish Lake Draft Alternative Energy Ordinance (March 30, 2016)

c: Catherine Iago, City Clerk
Tim Kuntz, City Attorney
Don Sterna and Eric Eckman, City Engineers
Mike Andrejka, Building Official
Jim Nayer, City Forester
Ron Wasmund, Septic System Inspector

12-1D-18: ALTERNATIVE ENERGY SYSTEMS:

- A. Solar Energy Systems: Solar energy systems are a conditional use in all zoning districts subject to the following regulations:
1. Building Permit: No solar energy system shall be erected, altered, improved, reconstructed, maintained, or moved without obtaining a building permit.
 2. Exemptions: The following systems shall be exempt from the requirements of this section and shall be regulated as any other building element requiring a building permit:
 - a. Building integrated solar energy systems.
 - b. Passive solar energy systems.
 3. Roof Mounted Systems:
 - a. Height: The maximum height of the system shall not exceed the structure height requirements in the applicable zoning district.
 - b. Setbacks: The system shall comply with all building setback requirements in the applicable zoning district and shall not extend beyond the exterior perimeter of the building on which the system is mounted.
 - c. Mounting: The system shall be flush mounted on pitched roofs or may be bracket mounted on flat roofs. Bracket mounted collectors shall only be permitted when a determination is provided by a licensed professional qualified to certify that the underlying roof structure will support loading requirements and all applicable building standards are satisfied.
 - d. Maximum Area: The system shall not cover more than eighty percent (80%) of the roof section upon which the panels are mounted.
 4. Ground Mounted Systems:
 - a. Height: The maximum height of the system shall not exceed fifteen feet (15') in height from the average natural grade at the base of the system.
 - b. Setbacks: The system shall be set back a minimum of fifteen feet (15') from all property boundary lines and thirty feet (30') from all dwellings located on adjacent lots, including any appurtenant equipment.
 - c. Location: The systems shall be limited to rear yards in all zoning districts.
 - d. Maximum Area: The system shall be limited in size to the maximum requirement allowed for accessory structures in the applicable zoning district or no more than twenty five percent (25%) of the rear yard, whichever is less.
 5. Screening: Solar energy systems shall be screened from view to the extent possible without impacting their function. Systems located within the business and industrial zoning

districts may be required to comply with the standards in subsection [12-1D-13-2C7](#) of this article where practical.

6. Color: Solar energy systems shall use colors that blend with the color of the roof material on which the system is mounted or other structures.
7. Glare: Reflection angles from collector surfaces shall be oriented away from neighboring windows and minimize glare toward vehicular traffic and adjacent properties. Where necessary, the city may require additional screening to address glare.
8. Utility Connection:
 - a. All utilities shall be installed underground.
 - b. An exterior utility disconnect switch shall be installed at the electric meter serving the property.
 - c. Solar energy systems shall be grounded to protect against natural lightning strikes in conformance with the national electrical code.
 - d. No solar energy system shall be interconnected with a local electrical utility company until the company has provided the appropriate authorization to the city, in compliance with the national electrical code.
9. Safety:
 - a. Standards: Solar energy systems shall meet the minimum standards outlined by the International Electrotechnical Commission (IEC), the American Society Of Heating, Refrigerating, And Air-Conditioning Engineers (ASHRAE), ASTM International, British Standards Institution (BSI), International Organization For Standardization (ISO), Underwriter's Laboratory (UL), the Solar Rating And Certification Corporation (SRCC) or other standards as determined by the city building official.
 - b. Certification: Solar energy systems shall be certified by Underwriters Laboratories, Inc., and the National Renewable Energy Laboratory, the Solar Rating And Certification Corporation or other body as determined by the community development director. The city reserves the right to deny a building permit for proposed solar energy systems deemed to have inadequate certification.
10. Easements: Solar energy systems shall not encroach upon any public drainage, utility, roadway, or trail easements.
11. Abandonment: Any solar energy system which remains nonfunctional or inoperable for a continuous period of twelve (12) months shall be deemed to be abandoned and shall be deemed a public nuisance. The owners shall remove the abandoned system, including the entire structure and transmission equipment, at their expense after obtaining a demolition permit.

B. Variance: Any required standard in this section that cannot be met may be considered by a variance request, in accordance with section [12-1L-5](#) of this chapter and considering the

following criteria unique to solar energy systems:

1. That the deviation is required to allow for the improved operation of the solar energy system;
2. That the solar energy system has a net energy gain;
3. That the solar energy system does not adversely affect solar access to adjacent properties;
4. That the solar energy system complies with all other engineering, building, safety, and fire regulations; and
5. That the solar energy system is found to not have adverse impacts on the area, including the health, safety, and general welfare of the public. (Ord. 485, 9-15-2015)

March 30, 2016

CITY OF SUNFISH LAKE
DAKOTA COUNTY, MINNESOTA

ORDINANCE NO. 2016-_____

**AN ORDINANCE AMENDING THE SUNFISH LAKE CITY CODE,
ARTICLE XII (ZONING REGULATIONS), TO ESTABLISH
ALTERNATIVE ENERGY SYSTEM REGULATIONS**

THE CITY COUNCIL OF SUNFISH LAKE DOES HEREBY ORDAIN AS FOLLOWS:

Section 1. Section 1202.02 (Definitions) of Article XII (Zoning Regulations) shall be amended to add the following definitions:

Alternative Energy System: A ground source heat pump or solar energy system.

Ground Source Heat Pump System Related:

1. **Closed Loop Ground Source Heat Pump System:** A system that circulates a heat transfer fluid, typically food-grade antifreeze, through pipes or coils buried beneath the land surface or anchored to the bottom in a body of water.
2. **Ground Source Heat Pump System:** A system that uses the relatively constant temperature of the earth or a body of water to provide heating in the winter and cooling in the summer. System components include open or closed loops of pipe, coils or plates; a fluid that absorbs and transfers heat; and a heat pump unit that processes heat for use or disperses heat for cooling; and an air distribution system.
3. **Horizontal Ground Source Heat Pump System:** A closed loop ground source heat pump system where the loops or coils are installed horizontally in a trench or series of trenches no more than twenty (20) feet below the land surface.
4. **Heat Transfer Fluid:** A non-toxic and food grade fluid in accordance with Minn. Rules 4725.7050.
5. **Ground Water Thermal Exchange Devices.** A heating or cooling device that depends on extraction and reinjection of groundwater from an independent aquifer to operate, as defined in Minn. Stat. § 1031.005.
6. **Bored Geothermal Heat Exchangers:** An earth-coupled heating or cooling device consisting of a sealed closed-loop piping system installed in a boring in the ground to transfer heat to or from the surrounding earth with no discharge, as defined in Minn. Stat. § 1031.005.

Solar Energy System Related:

1. Building-integrated Solar Energy System: A solar energy system that is an integral part of a principal or accessory building, rather than a separate mechanical device, replacing or substituting for an architectural or structural component of the building including, but not limited to, photovoltaic or hot water solar systems contained within roofing materials, windows, skylights and awnings.
2. Flush-mounted Solar Energy System: A roof-mounted system mounted directly abutting the roof. The pitch of the solar collector may exceed the pitch of the roof up to five (5) percent but shall not be higher than ten (10) inches above the roof.
3. Passive Solar Energy System: A system that captures solar light or heat without transforming it to another form of energy or transferring the energy via a heat exchanger.
4. Photovoltaic System: A solar energy system that converts solar energy directly into electricity.
5. Solar Energy System: 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 or cooling, electricity generation or water heating.

Section 2. Article XII (Zoning Regulations), Section 1230 (Reserved) is hereby amended to read as follows:

1230. ALTERNATIVE ENERGY SYSTEMS

- 1230.01 Purpose
- 1230.02 Ground Source Heat Pump Systems
- 1230.03 Solar Energy Systems

SECTION 1230.01 PURPOSE: The purpose of this section is to:

- A. Accommodate alternative energy sources by removing regulatory barriers and creating a clear regulatory path for approving alternative energy systems.
- B. Create a livable community where development incorporates sustainable design elements such as resource and energy conservation and use of renewable energy.
- C. Protect and enhance air quality and decrease use of fossil fuels.
- D. Accommodate alternative energy development in locations where the technology is viable and environmental, economic and social impacts can be mitigated.

SECTION 1230.02 GROUND SOURCE HEAT PUMP SYSTEMS:

A. Zoning District Allowance. Ground source heat pump systems in accordance with the standards in this section are allowed as an accessory use in all zoning districts.

B. Approvals Required. A building permit shall be obtained for any ground source heat pump system prior to installation. Borings for vertical systems are subject to approval and permitting by the Minnesota Department of Health.

C. General Provisions. All ground source heat pump systems within the City shall be subject to the following general provisions:

1. System Requirements.

a. Only closed loop ground source heat pump systems utilizing heat transfer fluids as defined in Minn. Rules 4725.7050 are permitted. Ground water thermal exchange devices as defined by Minn. Stat. § 103I.005 are not permitted.

b. Ground source heat pump systems located within public waters are prohibited.

2. Setbacks. All components of ground source heat pump systems including pumps, borings and loops shall be set back at least twenty-five (25) feet from all lot lines and the ordinary high water level of any public water body. Systems must otherwise comply with required well and boring setbacks as identified in Minn. Rules Chapter 4725.

3. Easements. Ground source heat pump systems shall not encroach on public drainage, utility roadway or trail easements.

4. Noise. Ground source heat pump systems shall comply with Minnesota Pollution Control Agency standards outlined in Minnesota Rules Chapter 7030.

5. Safety. Ground source heat pumps shall meet the requirements of the State Building Code.

~~C~~.D Abandonment. If a ground source heat pump system remains nonfunctional or inoperative for a continuous period of one (1) year, the system shall be deemed to be abandoned and shall constitute a public nuisance. The property owner shall remove the abandoned system and restore vegetation upon the site at his/her expense after a demolition permit has been obtained. If the property owner does not remove the abandoned system within thirty (30) days after the system becomes abandoned, the City shall send a written notice to the owner and direct the owner to remove the abandoned system. If the owner does not remove the abandoned system within ninety (90) days after the date of the written notice, the City shall have the power under Minn. Stat. § 429.021, Subd. 1(8) to abate the public nuisance by ordering the abatement after a public hearing

pursuant to Minn. Stat. § 429.031. The public hearing shall be preceded by mailed and published notices as required by Minn. Stat. § 429.031. If abatement has been ordered, the City may remove the abandoned system and charge the expense to the property owner. If the property owner has not paid the charges by the date set by the Council the charges may be specially assessed against the property pursuant to the procedures of Minn. Stat. § 429.061. Removal of the system shall be in accordance with the following:

1. The heat pump and any external mechanical equipment shall be removed.
2. Pipes or coils below the land surface shall be sealed in accordance with applicable regulations. Heat transfer fluid shall be captured and disposed of in accordance with applicable regulations. The top of the pipe, coil or boring shall be uncovered and grouted.

SECTION 1230.03 SOLAR ENERGY SYSTEMS:

A. Zoning District Allowance.

- 1. Roof mounted solar energy systems in accordance with the standards in this section are allowed as an accessory use in all zoning districts.**
- 2. Ground mounted solar energy systems in accordance with the standards in this section are a conditional use in all zoning districts.**

B. Approvals Required.

- 1. No solar energy system shall be erected, altered, improved, reconstructed, maintained, or moved without obtaining a building permit.**
- 2. Solar energy systems subject to the approval of a conditional use permit shall be processed according to Section 1204 of this Ordinance, and shall comply with the performance standards established by this Section and the stipulations imposed by the City Council.**

C. General Provisions. All solar energy systems within the City shall be subject to the following general provisions:

1. Exemption. Passive or building-integrated solar energy systems are exempt from the requirements of this Section and shall be regulated as any other building element.
2. Aesthetics. All solar energy systems shall minimize glare towards vehicular traffic and adjacent properties.
3. Feeder lines. The electrical collection system shall be placed underground within the interior of each parcel.

4. Safety.

a. Standards. All active solar energy systems shall meet the approval of the local building code official consistent with the State of Minnesota Building Code. Further, solar energy systems shall meet the minimum applicable standards outlined by the International Electrotechnical Commission (IEC), the American Society of Heating, Refrigerating, and Air-conditioning Engineers (ASHRAE), ASTM International, British Standards Institution (BSI), International Electrotechnical Commission (IEC), the Minnesota State Electric Code, the Minnesota State Plumbing Code, International Organization for Standardization (ISO), Underwriter's Laboratory (UL), the Solar Rating and Certification Corporation (SRCC) or other standards as determined by the City Building Official. Solar thermal systems shall further comply with HVAC-related requirements of the Energy Code.

b. Certification. Solar energy systems shall be certified by Underwriters Laboratories, Inc. and the National Renewable Energy Laboratory, the Solar Rating and Certification Corporation or other body as determined by the City Planner. The City reserves the right to deny a building permit for proposed solar energy systems deemed to have inadequate certification.

1.5. Utility Connection. All grid connected systems shall have an agreement with the local utility prior to the issuance of a building permit. A visible external disconnect shall be provided if required by the utility.

2.6. Abandonment. If a solar energy system remains nonfunctional or inoperative for a continuous period of one (1) year, the system shall be deemed to be abandoned and shall constitute a public nuisance. The property owner shall remove the abandoned system and restore vegetation upon the site at his/her expense after a demolition permit has been obtained. Removal includes the entire structure including transmission equipment. If the property owner does not remove the abandoned system within thirty (30) days after the system becomes abandoned, the City shall send a written notice to the owner and direct the owner to remove the abandoned system. If the owner does not remove the abandoned system within ninety (90) days after the date of the written notice, the City shall have the power under Minn. Stat. § 429.021, Subd. 1(8) to abate the public nuisance by ordering the abatement after a public hearing pursuant to Minn. Stat. § 429.031. The public hearing shall be preceded by mailed and published notices as required by Minn. Stat. § 429.031. If abatement has been ordered, the City may remove the abandoned system and charge the expense to the property owner. If the property owner has not paid the charges by the date set by the Council the charges may be specially assessed against the property pursuant to the procedures of Minn. Stat. § 429.061.

3.7. Easements. Solar energy systems shall not encroach on public drainage, utility roadway or trail easements.

D. Roof Mounted Systems. Roof mounted solar energy systems are a permitted accessory use in all zoning districts provided the following conditions are met:

1. Visibility. Roof mounted solar energy systems shall be designed to blend into the architecture of the building, and shall be screened from view to the extent possible without impacting their function.
2. Height. Roof-mounted solar energy systems shall comply with the maximum height requirements in the applicable zoning district.
3. Setbacks. Roof-mounted systems shall comply with all building setbacks in the applicable zoning district and shall not extend beyond the exterior perimeter of the building on which the system is mounted. Exterior piping for solar hot water systems shall be allowed to extend beyond the perimeter of the building on a side yard exposure.
4. Mounting. Roof-mounted solar collectors may be flush-mounted or bracket-mounted. Bracket-mounted collectors shall be permitted only when a determination is made by the City Building Official that the underlying roof structure will support apparatus, wind, and snow loads and all applicable building standards are satisfied. Roof or building mounted solar energy systems shall allow for adequate roof access to the south-facing or flat roof upon which the panels are mounted.

E. Ground Mounted Systems. Ground mounted solar energy systems may be approved by conditional use permit in accordance with the following standards:

1. Visibility. Ground mounted solar energy systems are required to adhere to accessory screening requirements from adjacent properties and public right-of-ways as provided in Section 1217.01 of this Article. **The system may not negatively impact views of abutting properties or serve to distract from the open natural setting of the community.**
↳
2. Height. Ground-mounted solar energy systems shall not exceed **twelve (12) feet** in height when oriented at maximum tilt in all zoning districts.
3. Setbacks. Ground-mounted solar energy systems shall comply with accessory structure setbacks in the applicable zoning district, and may not extend into setbacks when oriented at minimum design tilt.
- ~~3.4.~~ **Location. Ground mounted solar energy systems are not permitted in front yards.**
5. Maximum Coverage. The surface area of pole or ground mount systems shall not exceed half the building footprint of the principal structure.

Section 3. Section 1241.04 (R-1 District Accessory Uses) is hereby amended to add the following:

M. Ground source heat pump and roof mounted solar energy systems as regulated by Section 1230 of this Ordinance.

Section 4. **Section 1241.05-1 (R-1 District Conditional Uses) is hereby amended to add the following:**

F. Ground mounted solar energy systems as regulated by Section 1230 of this Ordinance.

Section 5. Section 1242.04 (INS District Accessory Uses) is hereby amended to add the following:

D. Ground source heat pump and roof mounted solar energy systems as regulated by Section 1230 of this Ordinance.

Section 6. Section 1242.05-1 (INA District Conditional Uses) is hereby amended to add the following:

H. Ground mounted solar energy systems as regulated by Section 1230 of this Ordinance.

Section 7. This Ordinance shall be in full force and effective from and after its passage and publication according to law.

ADOPTED this ____ day of _____ 2016 by the City Council of Sunfish Lake.

Molly Park, Mayor

ATTEST:

Catherine Iago, City Clerk