

ARTICLE 13. SOLAR ENERGY SYSTEMS

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13.1 PURPOSE.

The purpose of this section is to facilitate the construction, installation, and operation of Solar Farms (also known as Solar Energy Systems (SESs)) in Clarkton in a manner that promotes economic development and ensures the protection of health, safety, and welfare while also avoiding adverse impacts to important areas such as agricultural lands, endangered species habitats, conservation lands, and other sensitive lands<sup>1</sup>. It is the intent of this ordinance to encourage the development of SESs that reduce reliance on foreign and out-of-state energy resources, bolster local economic development and job creation, support the diversification of the state’s energy portfolio, strengthen energy and grid security, reduce greenhouse gas emissions, reduce local air and water pollution, and aid North Carolina in meeting its Renewable Portfolio Standard. This ordinance is not intended to abridge safety, health or environmental requirements contained in other applicable codes, standards, or ordinances. The provisions of this ordinance shall not be deemed to nullify any provisions of local, state or federal law.

The provisions of this section shall not be deemed to nullify any provisions of local, state or federal law.

*(Ord. Amendment, June 2, 2015, Section 1)*

<sup>1</sup>

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### 13.2 APPLICABILITY.

This Article applies to the construction of any new SES within the jurisdiction of the Town of Clarkton.

### 13.3 DEFINITIONS.

**Solar Energy System (SES)** - A solar collection system that generates electricity from sunlight to a wholesale electricity market through a regional transmission organization and an inter-connection with the local utility power grid and/or for direct distribution to a number of properties and consumers. Solar shall consist of a minimum of three (3) individual photovoltaic modules (solar panels), which are an assembly of solar cells to generate electricity.

**Level 1 Solar Energy System** - Level 1 SESs include the following:

- A. Roof-mounted on any code-compliant structure.
- B. Ground-mounted on an area of up to 50% of the footprint of the primary structure on the parcel but no more than 1 acre.
- C. Covering permanent parking lot and other hardscape areas.
- D. Building integrated solar (i.e., shingle, hanging solar, canopy, etc.).

**Figure 1: Images of Level 1 Solar Energy Systems**



Roof-Mounted SES



Ground Mounted SES



Ground Mounted SES



Solar Carport Structure

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**Level 2 Solar Energy System** - Level 2 SESs are ground-mounted systems not included in Level 1 that meet the area restriction listed below:

- A. Agricultural/Residential (R-20): SES  $\leq$  1/2 acres
- B. Residential Low Density (R-15): SES  $\leq$  1/2 acre
- C. Residential Medium Density (R-85): SES  $\leq$  1/2 acre
- D. Residential High Density (R-6): SES  $\leq$  1/2 acre
- E. General Commercial/Business: SES  $\leq$  10 acres
- F. Light Industrial: SES of any size

**Figure 2: Images of Level 2 Solar Energy Systems**



Level 2 solar farm arrays



**Level 3 Solar Energy System** – Level 3 SESs are systems that do not satisfy the parameters for a Level 1 or Level 2 Solar Energy System.

**(Ord. Amendment, June 2, 2015, Section 2)**

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### 13.4 APPLICABILITY.

13.4.1. This ordinance applies to the construction of any new SES within the jurisdiction of the Town of Clarkton.

13.4.2. An SES established prior to the effective date of this ordinance shall remain exempt:

- A. Exception: Modifications to an existing SES that increases the SES area by more than 5% of the original footprint or changes the solar panel type (e.g. photovoltaic to solar thermal) shall be subjected to this ordinance.

13.4.3. Maintenance and repair are not subject to this ordinance.

13.4.4. This ordinance does not supersede regulations from local, state, or federal agencies. Some important examples of such regulations include, but are not limited to:

**A. Building/Electrical Permits Required**

Nothing in this ordinance modifies already established building standards required to construct a SES.

**B. Onsite Wastewater System Avoidance**

Nothing in this ordinance modifies already established Department of Health and Human Services requirements. A SES shall not be constructed over onsite waste water systems (e.g. septic systems) unless approved by the Department of Health and Human Services.

**C. Stormwater Permit Required**

Nothing in this ordinance modifies the requirements or exempts any SES of complying with the various stormwater jurisdictions and regulations established by the Department of Environment and Natural Resources. North Carolina statute requires the acquisition of stormwater permits for construction projects that impact stormwater runoff.

**D. Historic Districts**

Nothing in this ordinance modifies already established State Historic Preservation Office requirements. May require additional permitting (certificates of appropriateness) to install solar in Historic Districts.

*(Ord. Amendment, June 2, 2015, Section 3)*

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### 13.5 PERMIT REQUIREMENTS.

13.5.1. The Type of permit required for an SES is displayed in the figure below.

**Figure 3: Required Permits for SES Development**

Types of Permits Required: P= Permitted Use; C= CUP= Conditional Use Permit						
Zoning District	Agricultural / Residential	Residential Low Density-R15	Residential Med. Density – R85	Residential High Density – R6	Commercial/ Business	Light Industrial
<b>Solar Energy Facilities</b>						
Roof-mounted, parking lot cover, or building integrated (Level 1)	P	P	P	P	P	P
Ground-mounted:						
up to 50% of the footprint of the primary structure (Level 1)	P	P	P	P	P	P
≤1/2 acre (Level 2)	SUP	SUP	NA	NA	NA	SUP
≤10 acres (Level 2 or 3)	SUP	SUP	NA	NA	NA	SUP
>10 acres (Level 2 or 3)	SUP	SUP	NA	NA	NA	SUP

(Ord. Amendment, June 2, 2015, Section 4)

### 13.6 PARCEL LINE SETBACKS.

13.6.1. The following table provides the Parcel Line setback to ground mounted SES equipment, excluding any security fencing, poles, and wires necessary to connect to facilities of the electric utility.

**Figure 4: Parcel Line Setbacks**

Zoning District	Level 1	Level 2	Level 3		
			Front	Side	Rear
Agricultural/Residential	Per Zoning District**,***	Per Zoning District*, **	30’*	15’*	25’*
Residential, Low density			50’*	50’*	50’*
Industrial			30’*	15’*	25’*
* 100’ setback for SES equipment, excluding any security fencing, to any residential dwelling unit. If the SES is on a working farm where the primary residential structure of the farm is on an adjacent lot then this 100’ setback will not apply to this primary residential structure.					
** Ground-mounted SES must comply with district front yard limitations and setbacks, or otherwise not impair sight distance for safe access to or from the property or other properties in the vicinity					
*** Level 1 SESs are not subject to screening requirements typically applied to accessory utility systems (HVAC, dumpsters, etc.).					

(Ord. Amendment, June 2, 2015, Section 5)



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### 13.7 HEIGHT LIMITATIONS.

13.7.1. The height of systems will be measured from the highest natural grade below each solar panel.

**Figure 5: Height Limitations\***

Zoning Districts	Level 1	Level 2	Level 3
Agricultural/Residential	Roof-mounted: Per zoning district	20'	20'
Residential, low density		20'	20'
Industrial	Ground-mounted: 20'	20'	20'
* This excludes utility poles and any antennas constructed for the project.			

**(Ord. Amendment, June 2, 2015, Section 6)**

### 13.8 SITE PLAN REQUIREMENTS.

13.8.1. A site plan, drawn and stamped by a North Carolina licensed surveyor or engineer, shall be submitted for all applications showing the following:

- A. The location and dimensions of all proposed areas for the placement of solar panels, screening/fencing and related improvements;
- B. Any pre-existing structures on the same lot, and principal structures on other properties that would affect the placement of solar panels;
- C. Parking and access areas;
- D. Location of any proposed solar access easements;
- E. Any proposed new structures.

**(Ord. Amendment, June 2, 2015, Section 9)**

### 13.9 REQUIREMENTS FOR LEVEL 2 AND LEVEL 3 SES.

13.9.1. Solar panels shall be mounted onto a pole, rack, or suitable foundation in accordance with manufacturer's specifications, in order to ensure the safe operation and stability of the system.

13.9.2. Multiple mounting structures shall be spaced apart at the distance recommended by the manufacturer to ensure safety and maximum efficiency.

13.9.3. The SES and components shall meet all requirements of the North Carolina State Building Code.

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- 13.9.4. The SES shall be fenced in and access controlled. The site must be accessible 24/7 for emergency service.
- 13.9.5. Buffering and Screening: SESs shall be screened from all streets and adjacent residential uses with a vegetative buffer. Existing trees within or near the required planting area and meets or exceeds the standards of this chapter may be used to satisfy the tree requirements of the planting area. The protection of tree stands, rather than individual trees, is strongly encouraged.
- 13.9.6. Signage. Public signage (i.e., advertising, educational, etc.) as permitted by the Town of Clarkton Zoning Ordinance, including appropriate or required security and safety signage.
- 13.9.7. Lighting. If lighting is provided at site, lighting shall be shielded and downcast such that the light does not spill onto the adjacent parcel or the night sky. Motion sensor control is preferred.

***(Ord. Amendment, June 2, 2015, Section 9)***

### **13.10 DECOMMISSIONING.**

- 13.10.1 For any SES one acre or more, a decommissioning plan signed by the party responsible for decommissioning and the landowner (if different) addressing the following shall be submitted with permit application.
- A. Defined conditions upon which decommissioning will be initiated (i.e., end of land lease, no power production for 12 months, etc.).
  - B. Removal of all non-utility owned equipment, conduit, structures, fencing, roads, and foundations
  - C. Restoration of property to condition prior to development of the SES.
  - D. The timeframe for completion of decommissioning activities.
  - E. Description of any agreement (e.g., lease) with landowner regarding decommissioning.
  - F. The party currently responsible for decommissioning.
  - G. Plans for updating this decommissioning plan.
  - H. Before final electrical inspection, provide evidence decommissioning plan was recorded with the register of deeds.

See Appendix B for copy of the Decommissioning Plan.

***(Ord. Amendment, June 2, 2015, Section 9(c))***

### **13.11 MODIFICATION TO EXISTING SOLAR FARMS**

- 13.11.1. Modifications to an existing SES that increases the SES area by more than 5% of the original footprint or changes the solar panel type (e.g., photovoltaic to solar thermal) shall be subjected to this section.

**13.12 AVIATION NOTIFICATION**

13.12.1. A map analysis showing a radius of five (5) nautical miles from the center of the SES with any airport operations within this area highlighted shall be submitted with permit application.

- A. For consideration of potential impacts to low altitude military flight paths, notification of intent to construct the SES shall be sent to the NC Commanders Council at least 45 days prior to permit application submission. Proof of delivery of notification and date of delivery shall be submitted with permit application. **Mail to: Commanding General MCIEAST; Attn: Mr. Bill Meier (NC Commanders Council) or successor; Marine Corps Installations East G-7 (MCIEAST); PSC Box 20005; Camp Lejeune, NC 28542. Email: Subject: NC Commanders' Council Notification of Solar Development Project in "Town or Town Name" Address: Meier CIV William A [William.meier@mcw.usmc.mil], Ayers CIV Bryan C [bryan.ayers@usmc.mil].** Notification shall include:

- (1) Location of SES (i.e., map, coordinates, address, or parcel ID).
- (2) Solar technology (i.e., polycrystalline PV, monocrystalline PV, Cadmium Telluride PV, evacuated tube solar thermal, flat plate solar thermal, etc.).
- (3) Approximate number of solar modules/panels.
- (4) System mounting (i.e., fixed-tilt on flat roof, fixed-tilt ground-mount, 1-axis tracking ground-mount, etc.).
- (5) The maximum height of the array from the ground or roof surface.
- (6) The maximum height of any new utility poles.
- (7) Power capacity of the system, in both DC and AC Watts where applicable.
- (8) Acreage of array and acreage of total project.
- (9) How will the project connect? (i.e., net meter, to existing distribution line, to new distribution line, to transmission line).
- (10) Will a substation be constructed? If so, provide location and size.
- (11) Is the site within five nautical miles of aviation operations? If so, provide the required SGHAT analysis results.
  - i. The latest version of the Solar Glare Hazard Analysis Tool (SGHAT) shall be used to evaluate the solar glare aviation hazard. The full report for each flight path and observation point, as well as the contact information for the Zoning Administrator, shall be sent to the authority indicated below at least forty-five (45) days prior to permit application submission. Proof of delivery of notification and date of delivery shall be submitted with permit application.
  - ii. Airport operations at airports in the National Plan of Integrated Airport Systems (NPIAS)<sup>2</sup> within 5 nautical miles of the center of SES: provide required



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information to the Federal Aviation Administration's (FAA) Airport District Office (ADO) with oversight of North Carolina.

- iii. Airport operations at airport not in the NPIAS, including military airports, within 5 nautical miles of the center of SES: provide required information to the NC Commanders Council for military airports and to the management of the airport for non-military airports. Send to: **[www.faa.gov/airports/planningcapacity/npias-reports/](http://www.faa.gov/airports/planningcapacity/npias-reports/)**. (As of October 2016, this is the Memphis ADO, but this is subject to change)
- iv. Any applicable SES design changes (e.g. module tilt, module reflectivity, etc.) after initial submittal shall be rerun in the SGHAT tool and the new full report shall be sent without undue delay to the contacts specified in f(1) and (f)(2) for accurate records of the as-built system.

***(Ord. Amendment, June 2, 2015, Section 7)***