

## Section 2008: Renewable Energy Generation Facilities

### 1. Introduction and purpose

Navajo County has been identified as an area with potential for the utility-scale generation of renewable energy.

The purpose of this section is to:

- Specify Special Use Permit application requirements for the development of utility-scale renewable energy projects with actual or planned generating capacity of at least one megawatt.
- Establish standards for the permitting, construction, operation, maintenance and decommissioning of utility-scale renewable energy generation facilities.

This section does not apply to personal or institutional renewable energy generation equipment that is intended to generate electricity or heat water for use primarily on the property on which the equipment is located, or to facilities with an actual or planned generating capacity of less than one megawatt.

### 2. Definitions

The following terms are defined as follows for purposes of this section. Other definitions may be found in Article 30.

SUP: A Special Use Permit approved by the Board of Supervisors pursuant to this section and the other applicable provisions of this ordinance.

Renewable Energy Generation facility: A facility with an actual or planned generating capacity of at least one megawatt for generating electricity by means other than nuclear or fossil fuel, including but not limited to wind, solar, biomass and geothermal facilities.

Project boundary: The boundary of a Renewable Energy Generation facility project as set forth in the project site plan and incorporated into the SUP.

Setback distance: The distance measured from:

For wind: The distance from the center of the wind turbine electrical generator tower foundation to the nearest property line, edge of a public road right-of-way or railroad right-of-way, third party transmission line, above-ground pipeline, communication tower, other structure or other boundary established by Navajo County.

For solar: The distance from the edge of any panel, collector, tower or other facility structure to the nearest property line, edge of a public road right-of-way or railroad right-of-way, third party transmission line, above-ground pipeline, communication tower, other structure or other boundary established by Navajo County.

For other Renewable Energy Generation technologies: The distance from the edge of any collector, tower or other facility structure to the nearest property line, edge of a public road right-of-way or railroad right-of-way, third party transmission line, above-ground pipeline, communication tower, other structure or other boundary established by Navajo County.

Solar Energy Generation facility: A Renewable Energy Generation facility utilizing solar technology and consisting of one or more solar energy systems and accessory structures and buildings, including substations and associated electrical infrastructure. The term does not include stand-alone solar electricity generation systems primarily for on-site residential,

institutional, commercial or agricultural use which may feed residual power into the electrical grid as defined by the Arizona Corporation Commission.

Wind Energy Generation facility: A Renewable Energy Generation Facility using wind technology and consisting of one or more wind turbines and accessory structures and buildings, including substations, anemometers and associated electrical infrastructure. The term does not include stand-alone wind electricity generating systems primarily for on-site residential, institutional, commercial or agricultural use which may feed residual power into the electrical grid as defined by the Arizona Corporation Commission.

Wind turbines (or towers): A wind energy system that uses the wind to turn a set of aerodynamic blades or devices attached to an electric generator or turbine. The term does not include small wind turbines used primarily to generate electricity for on-site residential, institutional, commercial or agricultural use.

### **3. Zoning Districts in which allowed / SUP required**

Renewable Energy Generation facilities are allowed only in the A-General, Rural and Industrial Zoning Districts, subject to securing an SUP and to the applicable site development standards set forth herein.

### **4. SUP application requirements**

An SUP shall be required before the commencement of any site preparation or any construction in connection with a Renewable Energy Generation project.

An application for an SUP shall be made to the Public Works Department for consideration by the Planning and Zoning Commission and final action by the Board of Supervisors.

If a Renewable Energy Generation facility incorporates multiple technologies, all requirements of this section applicable to each technology shall be satisfied.

In addition to the requirements for an SUP application as set forth in Section 2002, the applicant shall submit a detailed site plan, context plan, project narrative and any additional information as may be required below. Navajo County reserves the right to require additional information at any time as deemed necessary to ensure that the application and project are consistent with the public health, safety and general welfare and the requirements of this ordinance and other applicable laws.

#### **a. Minimum site plan requirements (in addition to those specified in Section 2002 or noted in the Navajo County application materials)**

- (1) Existing topography and drainage features, including the boundaries of any riparian or other environmentally sensitive areas.
- (2) Project boundaries, internal property lines and ownership.
- (3) Legal description (general description and a metes and bounds description) of the project boundary (and of any phases), as well as all Assessor Parcel Numbers.
- (4) Phasing, if applicable.
- (5) Indication of setbacks to all structures and improvements, as required by this section.
- (6) Approximate locations of proposed energy generating facilities and structures, operation and maintenance facilities, transmission corridors, etc.

- (7) Location and type of project security fencing, including any fencing proposed around transformers, turbines, phases, project boundaries or other secure areas.
- (8) Vicinity map, including existing and proposed roadways leading to the site, as well as any incorporated areas within three miles of the project boundary.

**b. Minimum context plan requirements**

- (1) Location and type of all existing structures, electrical and transmission lines and other facilities, both within the project boundary and within three miles of the project boundary.
- (2) Location and minimum distance from the project boundary to all existing residences and occupied structures within three miles of the project boundary.
- (3) Location and name of all public roadways and railroads within three miles of the project boundary. Also indicate access to the site from the nearest public roadway.
- (4) Location and minimum distance from the project boundary to the limits of all incorporated municipalities within three miles of project boundary.
- (5) Land use, ownership, parcel size and Assessor's Parcel Numbers for all parcels adjacent to the project boundary.
- (6) Property lines for adjacent properties as they intersect the project boundary.
- (7) Location, name and distance from nearest military low-level training routes and any private or public airports, if located within ten miles of the project boundary.
- (8) Identification of all constraints and critical issues within the project boundary and within three miles thereof, including all proposed improvements, setbacks and sound limitations (as noted in this section), microwave beam constraints, existing cultural, biological and wildlife constraints, existing structures, etc.
- (9) Aerial photos (taken no more than six months before the submittal date), depicting all of the area within the project boundary plus three miles in all directions. The scale shall be no less than approximately one inch equals one mile.

**c. Minimum project narrative requirements**

- (1) Description of the applicant and detailed description of the project.
- (2) Relationship to surrounding properties (uses, zoning, etc.).
- (3) Location of the project. Proof of adequate legal access to the site should be provided as an appendix to the project narrative.
- (4) Proposed traffic circulation system (on- and off-site), including existing and proposed improvements, dedications, widths of all rights-of-way, easements, etc.
- (5) Development schedule (including any phasing).
- (6) Description and location of community facilities and services within three miles of the project boundary (including school districts; national, state, county and municipal parks; recognized historic or heritage sites; wetlands and important bird areas as identified in federal, state, county or local databases or other generally-available documentation).

- (7) Conformance of the proposal to the Navajo County comprehensive plan and any other area or municipal plans.
- (8) Plan for compliance with public participation requirements set forth in this section.
- (9) Explanation of conformance to development standards and requirements of Navajo County, including structure types, heights of all structures, number of structures, setbacks, sound levels, proposed screening, signage, etc.

**d. Additional SUP application information required for all projects**

- (1) A comprehensive transportation plan for moving necessary project equipment within Navajo County, to be reviewed and approved by the Public Works Department and (if applicable) the Arizona Department of Transportation (ADOT). At a minimum, the plan shall include:
  - A. Identification of all state and county roads to be used for transporting overweight or oversized wind turbine generators, solar panels, towers or substation parts, or overweight or oversized equipment for construction, operation or maintenance of the project, as well as identification of any railroad sidings to be used.
  - B. A graphic and written description of the access route from the nearest public road to the site, which shall include:
    - i. Road surface material, stating the type and amount of surface cover.
    - ii. Width, length and grades of the improved access route.
  - C. A method for assessing potential future road damage to any public roads.
  - D. Applicable weight and size limits, and all required permits.
  - E. Dust control procedures for all unpaved roadways and access routes (during and post-construction).
  - F. A plan for posting a surety bond or equivalent security for the repair of any damage to any public roadway caused during construction, operation or maintenance of the project. Such plan shall be submitted to and approved by the Public Works Department and by ADOT, if applicable.
- (2) If required by federal or state law, a copy of the archaeological and cultural resources Impacts report or similar document concerning the location and extent of known archaeological resources, based on a literature survey and, to the extent required by applicable law, an archeological/cultural resources site reconnaissance of the proposed locations of the project facilities. The archaeological and cultural resources Impacts report shall be submitted to the appropriate federal and state agencies for review and approval.
- (3) Documentation confirming an interconnection agreement and a power purchase agreement (or equivalent agreements).
- (4) Copies of any and all reports or analyses issued, approved or adopted by an agency of the federal government pursuant to the National Environmental Policy Act in connection with the construction or operation of the project shall be submitted, and mitigation measures shall be incorporated into an environmental plan for implementation of the recommendations contained in such reports.
- (5) A project sound study, performed in compliance with subparagraph 5.n of this Section 2008.

- (6) A visual impacts assessment of the project and a plan for mitigation of impacts, consisting of the following:
    - A. A 360-degree visual simulation of the project in its planned surroundings.
    - B. Day and nighttime visual simulations of the project from locations, approved by the Public Works Department, at nearby public roadways, nearby occupied structures, and the nearest municipality.
    - C. A simulation of potential glint and glare from the proposed project, if applicable.
  - (7) A decommissioning plan for removal of the facilities and the restoration of the site upon a revocation of the SUP pursuant to paragraph 9 of this Section 2008 or the expiration of the SUP. Removal of the facilities and restoration of the site shall mean that all safety hazards created by the installation and operation of the Renewable Energy Generation facility shall be removed and the site shall be restored to its natural pre-project condition to the extent reasonably possible, including the removal of foundations and footings to 36" below grade and the re-vegetation of any roads created or other areas graded or disturbed during the project. The SUP holder shall maintain a bond in the amount of the full decommissioning cost at the end of the anticipated life of the project, net of salvage value, as estimated by a Professional Engineer registered in the State of Arizona. Said bond shall be reviewed and approved as to form, substance and amount by the Public Works Department. The engineer's estimate of decommissioning cost shall be renewed no less than every five years by a Professional Engineer registered in the State of Arizona, and a copy of each renewed estimate shall be provided to the Public Works Department for review and approval. The decommissioning bond shall be adjusted in accordance with the renewed cost estimate within 30 days after approval by the Public Works Department. The SUP holder shall provide proof that the bond is in place no later than the date of the commencement of construction. A single bond shall be provided for the benefit of Navajo County and all public and private landowners on whose land any portion of the project will be located. This requirement shall be a condition of approval of the SUP. The Board of Supervisors, upon the recommendation of the County Attorney and the Director of Public Works, may approve variations from the requirements of this paragraph if warranted by the particular circumstances of a project.
  - (8) Standard drawings, cut sheets and elevations of any tower structures that include the tower, base and footings, as well as an engineering analysis of any towers showing compliance with the applicable building codes.
  - (9) A copy of an environmental impact study, performed in accordance with the Arizona Game & Fish Department's *Guidelines for Reducing Impacts to Wildlife from Wind Energy Development in Arizona* and *Guidelines for Solar Development in Arizona* and with the United States Fish & Wildlife Service's recommendations for wind energy development. Additionally, a letter from the Arizona Game & Fish Department will be required prior to scheduling of the SUP application for a hearing before the Planning and Zoning Commission, detailing the agency's final recommendations for the project.
- e. **Additional SUP application requirements for Wind Energy Generation projects (to be included with the site plan, context plan or project narrative, as appropriate)**
- (1) Information regarding the turbine manufacturer(s) and model(s), "nameplate rating" output (as determined by the manufacturer) of each wind turbine model, tower or tower array locations ("corridors"), maximum tower heights, maximum rotor diameters, maximum blade shaft/rotor RPM, approximate locations of proposed structures and buildings, and certification for each turbine model that it is a production model and not an experimental or prototype model. Experimental and prototype models are prohibited.

(2) A shadow flicker assessment of the proposed project shall be required. Methods for mitigation to affected residences and roadways shall be provided.

**f. Additional SUP application requirement for Solar Energy Generation projects (to be included with the site plan, context plan or project narrative, as appropriate)**

(1) The types, manufacturers, and specifications of the proposed solar energy generating devices, locations of devices or device arrays, and approximate locations of other proposed structures and buildings.

**g. Additional SUP application requirement for other types of Renewable Energy Generation projects (to be included with the site plan, context plan or project narrative, as appropriate)**

(1) Water demand characteristics of the proposed Renewable Energy Generating facility and a water supply study that details how such demand will be met and the anticipated impacts on surface/ground water supplies.

**5. General development standards for all Renewable Energy Generation facilities**

a. Renewable Energy Generation facilities shall be allowed only in the A-General, Rural and Industrial Zoning Districts and only with an SUP.

b. All necessary building, grading and other permits shall be obtained from the Public Works Department prior to any site preparation or construction. All facilities must be designed and constructed in compliance with all applicable federal, state and local development and building and safety codes.

c. Renewable Energy Generation facilities shall minimize and mitigate telecommunication interference (electromagnetic fields and communications interference generated by the project). No interference with public communication systems shall be allowed.

d. A minimum of on-site roadways shall be constructed. Temporary access roads and excess roadway widths for initial equipment/facility installation shall be re-vegetated, using native species plants and seeds, to a natural condition after completion of installation as a condition of the SUP. The applicant shall submit a plan of all proposed roads, temporary and permanent, for review and approval by the Public Works Department prior to the issuance of any grading or building permits.

e. Electrical collector lines, which connect electricity generation devices to any substations, shall be placed underground except where (a) they cross sensitive biological or archaeological resources, such as canyons, wetlands or sites eligible for the national register, or rugged terrain that would prevent the use of underground trenching technology, (b) project terrain is found to be unsuitable, as determined by the applicant and confirmed by the County Engineer, or (c) burying the lines would violate applicable laws or regulations. In these cases, collector lines will be allowed above ground subject to approval by the Public Works Department. Utility lines serving the electricity or phone requirements of buildings shall be placed in accordance with the utility's easement requirements.

f. No building or structure may be constructed or occupied prior to full compliance with all applicable Public Works Department requirements, including but not limited to requirements concerning grading and drainage plans, flood control requirements, and the issuance of building and other permits for the proposed structures.

g. Floodplain Use Permits (where required) for any development in a floodplain shall be obtained through the Flood Control District prior to any such development.

- h.** Signs associated with the project are limited to one project identification, information, interpretive and address sign of not more than 24 square feet located on the project site at each point of ingress and egress. No other signs shall be installed except for required warning and directional signs. No advertisements, prominent logos or other prominent messages are allowed on any tower, blade, generator housing, hub or any other part of any structure. Signage shall not be used for advertising. The SUP holder shall obtain prior to installation sign permits from the Public Works Department for all signs for which permits are required.
- i.** Renewable Energy Generation projects shall include fire control and prevention measures as outlined in the Uniform Fire Code and as required by the local Fire District or State Fire Marshall.
- j.** Renewable Energy Generation projects shall comply with applicable Federal Aviation Administration (FAA) lighting, navigation and other requirements. Lighting should be the minimum required by FAA regulations or other public safety considerations. The use of low-intensity, red pulsating/blinking lighting is preferred so long as consistent with FAA regulations. The use of strobes and strobe-type lighting for nighttime use is prohibited. To the extent allowed by the FAA, all nighttime safety lighting (including that on permanent meteorological towers) shall be synchronized to go "on" and "off" at the same time. All lighting shall be in compliance with the Navajo County Lighting Ordinance.
- k.** Renewable Energy Generation projects shall comply with applicable Federal Communication Commission (FCC) requirements, including those applicable to microwave communication links in the vicinity.
- l.** The design of buildings and other structures shall, to the extent reasonably feasible and consistent with public safety, use materials, colors, textures, screening and landscaping that will blend the facility into the existing environment.
- m.** Prior to the issuance of any permits for site preparation or construction, the following shall be submitted to and approved by the Public Works Department (may be submitted prior to or in conjunction with the permit applications):

  - (1)** A detailed final site plan, in conformance with the requirements of this section and any stipulations of approval set forth in the SUP. The final site plan shall include, at a minimum, the following information:

    - A.** Precise location of each approved wind or solar tower (including any modules, panels or mirrors), electricity collectors and substations. The coordinate system shall be: North American Datum 1983 Arizona State Plane Eastern Zone, U.S. Survey Feet, North American Vertical Datum 1988.
    - B.** Location of all maintenance, storage or other buildings, along with details regarding such buildings (dimensions, footprint, height, square footage, parking, etc.).
    - C.** Roadways – temporary and permanent, both on- and off-site – along with the roadway width, improvements and surfacing. Off-site roadway information must show access from the site to a dedicated public roadway.
    - D.** Grading, drainage, topographic and flood plain information, including a grading and drainage report.
    - E.** A construction plan detailing phases, expected environmental impacts during construction, and measures, consistent with best management practices, for mitigation of dust, noise and other physical impacts of construction.

- F. Estimates of potable and non-potable water demand and wastewater characteristics, production and disposal.
- G. Geotechnical or geological reports prepared and sealed by an Arizona-registered professional engineer or professional geologist that shall include all analyses and evaluations necessary to show compliance with all applicable geotechnical and seismic requirements as expressed in all applicable professional, county, state or federal codes, standards or regulations.
- H. Any blasting done in conjunction with the development and/or operation of the Renewable Energy Generation Facility shall conform with applicable federal and state requirements.

A certificate stating that the project is in full compliance with the above requirements may be required. The Director of the Public Works Department may require the submittal of additional documentation of compliance when deemed necessary to ensure that the project is consistent with the public health, safety and general welfare.

- (2) A certification by an Arizona-licensed land surveyor that the project boundary has been surveyed under the surveyor's supervision or that a previous survey was performed by an Arizona-licensed land surveyor and that sufficient monuments have been placed to accurately establish or re-establish the project boundary in the event of lost monuments. An ALTA survey may be required as a condition of the Special Use Permit.
  - (3) A plan for the mitigation of potential soil erosion and sedimentation shall be prepared as required by applicable state and federal laws and regulations. The plan shall include provisions for site re-vegetation and shall include sediment collection facilities as may be required by the Arizona Department of Environmental Quality, the Public Works Department or the appropriate resource conservation district.
- n. Noise requirements and mitigation measures (this paragraph applies to all Wind Energy Generation facilities and may be applied to other Renewable Energy Generation facilities if deemed appropriate by Navajo County):
- (1) Audible sound limits:
    - A. During facility operation, the  $L_{A90,10}$  – which is shorthand for the A-weighted tonality-adjusted ambient sound pressure level exceeded 90% of the time, based on 10-minute-duration measurement intervals – shall not exceed the greater of 45 dBA or background plus 5 dBA at any point on the nearest project boundary in either of the following circumstances:
      - i. There is privately or publicly owned land with an occupied structure within one mile of the project boundary; or
      - ii. There is any privately owned land adjacent to the project boundary that is not zoned Industrial (I-1 or I-2).
    - B. During facility operation, the  $L_{A90,10}$  shall not exceed the greater of 50 dBA or background plus 5 dBA at any point on the project boundary in any circumstance other than those set forth in paragraph A above.
    - C. A waiver of the sound requirements set forth in subparagraphs A and B above may be submitted for situations where the project boundary is adjacent to publicly owned land; provided, however, that the sound levels set forth in subparagraph A shall not be

exceeded at any point where the publicly owned land shares a common property line with privately owned land outside the project boundary.

**(2) Low frequency sound and infrasound:**

All wind turbine operations shall meet the low-frequency noise requirements applicable to wind turbines as specified in Noise Requirement Guidelines adopted, published and amended from time to time by the Board of Supervisors.

**(3)** The requirements of subparagraph (1) above require that background (pre-development) sound levels be properly assessed, that sound levels be forecast in advance of SUP approval, and that, once a project commences operation, sound levels again be assessed as part of compliance-period assessment. Background and post-construction compliance sound measurements shall comply with Noise Requirement Guidelines adopted, published and amended from time to time by the Board of Supervisors. If there is any conflict between the requirements of this ordinance and the requirements of such guidelines, the more stringent requirement(s) shall control.

**(4)** Before an SUP is issued, the applicant's independent consultant shall complete a sound evaluation by determining existing (pre-project) background sound levels and forecasting ambient sound levels anticipated upon completion of the facility. The evaluation shall address facility aging and planned or probable modifications. If the project is permitted and constructed, when it is in operation the SUP holder's independent consultant shall complete a compliance-period sound evaluation. The coordinate system for the pre-project evaluation and post-construction compliance evaluation shall be: North American Datum 1983 Arizona State Plane Eastern Zone, U.S. Survey Feet, North American Vertical Datum 1988.

For phased / staged development, background sound levels shall be determined before the initial phase of the project. For a situation in which multiple developments by the same or multiple developers are expected in an area, the same applies.

**(5)** If sound levels resulting from a proposed facility exceed the criteria specified above, a waiver may be granted by the Board of Supervisors after review and recommendation by the Planning and Zoning Commission, provided that the following has been accomplished: A written consent from each affected property owner has been obtained, stating that the owner is aware of the proposed facility and the sound limitations imposed by this section, that consent is granted to allow sound levels to exceed the maximum limits specified herein, and that such consent will be memorialized in a notice recorded with the Navajo County Recorder to notify future owners of the subject property that sound levels may exceed the sound levels specified herein.

**(6)** During the first three months of facility operation and more specifically during a period of normal full production operations, the SUP holder shall verify compliance with subparagraph (1) above utilizing an independent consultant. Additionally, continuing compliance shall be verified as subsequently requested in writing by the Navajo County Engineer, but not more often than annually. If audible sound is found to exceed the limits specified in subparagraph (1) above, the SUP holder shall identify and remove from service the equipment responsible for the excessive sound until the problem can be cured or mitigated.

**(7)** Plans for determining background sound levels and for modeling/simulation shall be submitted by the applicant for the Public Works Department's review and approval in advance of the work.

**o.** Project fencing, if applicable, shall include minimum 18 inch by 18 inch signs warning of the presence of high voltage. Such signs shall be located a maximum of 300 feet apart and at all points of site ingress and egress. Projects without fencing shall place such warning signs on each

transformer building and all points of ingress and egress. Project fencing, if applicable, shall be a minimum of six feet and maximum of eight feet in height (excluding barbed wire or cyclone wire fencing, which is permissible).

- p. Navajo County reserves the right to contract with a third-party consultant for the review and evaluation of the proposed project and any of the application materials, particularly the sound study. The cost for any such review shall be reimbursed to Navajo County by the applicant before any building permit is issued. Additionally, and if deemed necessary, the cost for any third-party review(s) of any long-term monitoring or response to complaints or operational changes shall be reimbursed to Navajo County by the SUP holder within 30 days after written demand by the County.

## **6. Additional development standards for Wind Energy Generation facilities**

- a. The minimum safety setback distance, location and spacing requirements for Wind Energy Generation facilities shall be as follows. As used herein, "total tower height" means the height from grade to the top of the structure, including the uppermost extension of any blade (i.e., "straight up").

(1) Wind towers shall be placed in accordance with the greater of the applicable setback and location requirements set forth in paragraphs A, B and C below:

**A.** Such that the sound standards established in subparagraph 5.n of this Section 2008 will not be exceeded.

**B.** Setbacks related to areas outside the project boundary:

- i. Incorporated municipalities and areas with a formally adopted area plan: Individual wind towers shall be placed within the project boundary at least one mile from the corporate limits of any municipality or from the boundary of any area with a formally adopted area plan.
- ii. Privately or publicly owned land with an occupied structure within one mile of the project boundary: Individual wind towers shall be placed within the project boundary at least ¼-mile (1,320 feet) from the project boundary nearest to the occupied structure.
- iii. Adjacent privately owned land that is not zoned Industrial (I-1 or I-2): Individual wind towers shall be placed within the project boundary at least ¼-mile (1,320 feet) from the common property line with such property.
- iv. Adjacent publicly owned land that does not have an occupied structure within one mile of the project boundary: Individual wind towers shall be placed within the project boundary at least 1.1 times (110%) the total tower height.
- v. All other adjacent land not included in one of the foregoing categories: Individual wind towers shall be placed within the project boundary at least 1.1 times (110%) the total tower height.

**C.** Setbacks related to areas within or outside the project boundary:

- i. Roadway (public or publicly-maintained): Individual wind towers shall be set back from any public or publicly-maintained roadway (as measured to the nearest edge of the right-of-way) at least ¼-mile (1,320 feet).

- ii. Railway: Individual wind towers shall be set back from any railway (as measured to the nearest edge of the right-of-way) at least 1.5 times (150%) the total tower height.
  - iii. Utility lines: Individual wind towers shall be set back from any utility line, above or below ground (as measured to the nearest edge of the utility easement) at least 1.5 times (150%) the total tower height.
  - vi. Interior property lines, phase lines and structures: Individual wind turbine electrical generators shall be set back from any interior property line, phase line or structure (regardless of use), at least 1.1 times (110%) the total tower height.
- (2) The minimum setbacks from the project boundary for all non-tower uses and structures (such as administrative buildings, meteorological or anemometer towers, maintenance buildings, operations buildings, transformers, etc.) shall conform with the setback requirements for the Zoning District in which the property is located.
- (3) The Board of Supervisors may approve a reduction in the setback requirements set forth above in accordance with any or a combination of the following circumstances:
- A. The project shares a common property line with another approved Wind Energy Generation facility.
  - B. A written consent from an affected property owner has been obtained, stating that the owner is aware of the proposed facility and the setback requirements imposed by this section, that consent is granted to allow lesser setbacks than those specified herein, and that such consent will be memorialized in a notice recorded with the Navajo County Recorder to notify future owners of the subject property that setbacks are less than those specified herein.
  - C. An adjacent property owner who is also pursuing the development of a Renewable Energy Generation facility has filed a letter of consent to the proposed setback reduction with the Public Works Department.
  - D. The parcel on which the project is located and an adjacent parcel are held in common ownership.
  - E. The current use of an adjacent property generates sound in excess of that permissible for the Wind Energy Generation facility under the terms of this section.
- (4) Setback areas may be used for access within the development but are otherwise to remain in their current vegetative state.
- b. Towers, generator housings, hubs and blades shall be painted a non-reflective, unobtrusive color which shall complement the surrounding landscape. Light environmental colors (such as white, off-white, beige or tan), will be considered in the context of the landscape. No advertisement prominent logo or other prominent wording is allowed on any tower, blade, generator housing, hub or any other part of the structure.
  - c. The applicant shall avoid locating turbines in mountain passes or draws or on cliff edges in order to minimize avian collisions when wildlife studies show that the project would pose a significant risk to avian populations. Towers and nacelles shall be designed so as not to attract nesting birds or serve as perches for raptors. The SUP holder shall take all reasonable measures to keep the site free of carrion to avoid attracting raptors.

- d. If pre-construction wildlife studies show that the proposed project facilities or uses would pose a significant risk to avian populations, post-construction monitoring, performed pursuant to Arizona Game & Fish Department and U.S. Fish & Wildlife Service guidelines, shall identify any wildlife impacts in an annual report submitted to the Arizona Game & Fish Department and U.S. Fish & Wildlife Service, with a copy to the Public Works Department. The annual report shall include avian deaths due to wind tower collisions.
- e. All wind towers must be designed and constructed, to the greatest extent feasible, so as to prevent interior/exterior access by the public and shall have interior ladders and locking doors.
- f. Experimental or prototype wind towers are prohibited. All wind towers must be standard production models commercially available from the manufacturer.
- g. Wind turbine designs with blades downwind of the tower are prohibited.
- h. For construction and permit purposes, all wind towers shall conform to the regulations for the applicable seismic zone of the building code.
- i. All wind towers and other structures shall comply with all applicable county, state and federal laws, ordinances and regulations.

**7. Additional development standards for Solar Energy Generation facilities and other technologies**

- a. Solar Energy Generating facilities and others are limited to non-water-consuming technologies, such as photo-voltaic, “dry-cooling” or similar technology.
- b. Solar panels and collectors, and similar equipment for solar or other facilities, shall be set back from the project boundary the greater of 500 feet or 1.5 times (150%) the total structure height. The minimum setbacks for all non-panel and non-collector uses and structures, such as administrative buildings, maintenance buildings, operations buildings, transformers, etc., shall conform with the setback requirements for the zoning district in which the property is located.
- c. Solar Energy Generating facilities and others shall comply with all applicable county, state and federal laws, ordinances and regulations.

**8. Use of SUP, terms and conditions**

- a. Any Renewable Energy Generation facility that is granted an SUP shall be developed in accordance with the schedule for development and stipulations set forth in the SUP.
- b. An SUP for a Renewable Energy Generation facility shall be valid for the anticipated useful life of the project.
- c. An SUP for a Renewable Energy Generation facility shall not run with the land and may be transferred or assigned to a new holder only with the written approval of the Board of Supervisors following a public hearing.

**9. SUP suspension and revocation**

- a. Any SUP issued pursuant to this section may be suspended or revoked by the Board of Supervisors for material non-compliance with the requirements of this section or the stipulations set forth in the SUP. An SUP shall be subject to suspension or revocation at a duly noticed public hearing only if the SUP holder has failed to cure the material non-compliance after no less than 30 days’ written notice of such non-compliance from the Director of Public Works.

- b. If a Renewable Energy Generation facility becomes unsafe or inoperable, the SUP is likewise subject to suspension or revocation by the Board of Supervisors as follows:
- (1) An “inoperable Renewable Energy Generation facility” is one that does not generate a significant amount of electricity for 180 consecutive days, unless such non-generation is due to an act of nature, declared emergency or other cause beyond the reasonable control of the SUP holder or unless the SUP holder demonstrates that modernization, rebuilding or repairs are in progress or planned and will be diligently completed.
  - (2) An “unsafe Renewable Energy Generation facility” is one that has been found by a state or federal administrative agency or a court of competent jurisdiction to have repeatedly violated applicable health or safety laws, unless the SUP holder demonstrates that measures to cure such violations are in progress or planned and will be diligently completed.
  - (3) Every unsafe or inoperable Renewable Energy Generation facility is hereby declared to be a public nuisance per se which shall be subject to abatement by all available legal and equitable remedies.
  - (4) Upon a complaint by the Director of Public Works that a Renewable Energy Generation facility is inoperable or unsafe, the Board of Supervisors shall convene a public hearing at the earliest possible date after written notice to the SUP holder. Pending a final determination that the facility is inoperable or unsafe, the Board may suspend the SUP or impose such conditions as may be appropriate to protect the public health, safety and welfare. Upon a final determination that the facility is inoperable or unsafe, the Board may suspend or revoke the SUP or impose such conditions as may be appropriate to protect the public health, safety and welfare.
- c. No later than 30 days after the revocation or expiration of the SUP, the decommissioning plan required by subparagraph 4.d.(7) of this Section 2008 shall be implemented and decommissioning shall proceed diligently to completion.

#### **10. Joint agency approvals**

- a. If the applicant is also applying to the State of Arizona, U.S. Bureau of Land Management (BLM) Forest Service (USFS) or other federal agency for a right-of-way grant, lease or any other form of authorization or approval for a renewable energy project in Navajo County to be located in whole or part on land managed by the State, BLM, USFS or other federal agency, or the applicant is also applying to the Western Area Power Administration or other federal power marketing agency (PMA) for an interconnection or transmission agreement for a renewable energy project in Navajo County, then the application may be jointly considered by the Planning and Zoning Commission and Board of Supervisors and the State, BLM, USFS, other federal agency or PMA (including without limitation joint hearings and coordinated application and mitigation requirements), and any and all findings, reports, studies, statements, assessments or analyses issued, approved or adopted by the State, BLM, USFS, other federal agency or PMA, including any mitigation measures required by any of those agencies, may be considered and adopted by the Planning and Zoning Commission and the Board of Supervisors in connection with the Navajo County application.
- b. This section does not purport to regulate Renewable Energy Generation projects on state or federal land except insofar as state or federal agencies may require compliance with Navajo County zoning requirements as part of their own application processes.
- c. In the event of any inconsistency between any requirement of this section and any requirement of state or federal law, now or in the future, the state or federal requirement shall control and this section shall be interpreted and applied consistently therewith.

## **11. Public Outreach.**

As part of the SUP review and approval process, and to ensure adequate public outreach, the applicant shall do the following:

- a.** Provide the following:
  - (1)** A list of all property owners of record within one mile of the project boundary, with current contact information (address and telephone number).
  - (2)** A list of all property owners of record within 300 feet of each access route to the project from a public roadway, as well as within 300 feet of each public roadway that requires any improvements in connection with the project, with current contact information (address and telephone number).
  - (3)** Notice by first class mail to all property owners listed under subparagraphs (1) and (2) above, such notice to include a narrative description of the project, identification of transportation routes, vicinity map showing surrounding properties, and a layout of the proposed facility and accessory buildings indicating setback distances to property lines.
- b.** Schedule, publicize and conduct at least two public meetings (in collaboration with neighborhood groups and property owner associations, where available) in the project area at least 30 days before the Planning and Zoning Commission hearing. Public Works staff is available to suggest to the applicant potential meeting sites and publicity measures.
  - (1)** The visual simulation required under subparagraph 4.d.(6) of this Section 2008 shall be presented at each meeting.
  - (2)** Feedback cards shall be provided to attendees and tabulated results shall be submitted to the Public Works Department within five days after each meeting.
- c.** Establish a web site *or* ".ftp" site, linked to the Navajo County web site if possible, giving a summary of the project (site plan, context plan and summary description) and applicant contact information before holding the first public meeting as required above. Provide a mechanism on this site for the submission of public comments.
- d.** Provide a contact name and telephone hotline, the details of which are printed on a prominent sign at each project entrance and maintained on record with the Public Works Department, by which citizens can leave comments and complaints 24 hours a day for the life of the project. The SUP holder shall take all reasonable efforts to review and address (including returning the call when appropriate) all non-urgent messages within 72 hours and all urgent messages within 24 hours. Provide the County with a monthly summary of complaints and the manner in which they were addressed.

## **Renewable Energy Generation Facilities**

### **Noise Requirement Guidelines**

#### **1. Pre-development sound modeling**

Sound pressure level simulations (modeling) and related reporting shall satisfy the following:

- a. Sound pressure levels shall be developed under source, atmospheric and receiver site conditions that will yield the maximum expected sound pressure levels at the receiver location.
- b. Follow International Electrotechnical Commission (IEC) standard 61400-11 and other applicable IEC standards for determining wind turbine sound power levels.
- c. Follow applicable International Organization for Standardization (ISO) 9613-1 and 9613-2, or use appropriate American National Standards Institute (ANSI) standards for wind turbine sound modeling.
- d. Utilize a model and modeling methodology that can yield reliable forecasts of both A-weighted and C-weighted sound pressure levels at distances of interest.
- e. Identify and explain the simulation model, as well as codes, sound propagation physics, phenomena or approaches included in the model. Identify and explain model assumptions or simplifications.
- f. Quantitatively assess and describe model sensitivity – i.e., on what parameters do the simulation results strongly depend, and on what parameters do the results only weakly depend?
- g. Explain whether and how frequency-dependent sound attenuation is included in the simulation(s).
- h. Explain whether and how low-frequency sound (approximately 1-125 Hz) is included in the simulation(s).
- i. Explain whether and how the simulation(s) capture known or anticipated atmospheric stability (wind shear) impact(s) on sound pressure levels.
- j. Interpret the simulation results in terms of known or anticipated diurnal (daily) variations in background and wind turbine contributions to sound pressure levels at receiver locations.
- k. Explain whether and how synchronization during high wind conditions of multiple wind turbines and possible effects due to coherent sound pressure wave propagation are included in the simulation(s).
- l. Identify and explain atmospheric temperature, pressure and humidity values used for simulations.
- m. Explain whether and how impacts of summer-time atmospheric temperature inversions and monsoonal high-humidity conditions are included in the simulation(s);
- n. Explain whether and how sound pressure wave refraction is included in the simulation(s).

- o. Prepare a sound contour map that utilizes an aerial photo showing the project boundary, areas within two miles of the project boundary, and maximum expected sound contours at 5 dBA intervals (with a range from 30 dBA up to 50 dBA). The sound model shall use a 27 ft/s (8 m/s) wind speed at 35 ft. (10 m) elevation above ground level, adjusted to anticipated hub height using a defensible method.
- p. For each turbine configuration, provide a map of forecast sound level contours.
- q. Indicate on a topographical map for each wind turbine the manufacturer, model number and location of sources, including hub height.
- r. Include results of independent source power level testing, inclusive of tonal audibility, authorized by the source manufacturer and conducted in accord with IEC 61400-11.
- s. Follow contemporary standards of practice in acoustic science.
- t. Models used to simulate sound propagation shall be calibrated and validated as part of the modeling process.
- u. Utilize predicted (modeled) sound levels expressed in terms of  $L_{Aeq}$ .
- v. Provide numerical estimates of uncertainties present in each summed sound pressure level component in the simulation(s) and develop numerical estimates of the uncertainties for the sums.
- w. If sound due to a Renewable Energy Generation facility is expected or known to contain a steady or intermittent pure (or near pure) tone, the A-weighted sound pressure level standards for audible noise set forth in the ordinance shall be reduced by 5 dB. A pure tone is defined as a sound pressure level that is, approximately, a simple sinusoidal function of time and is characterized by a single frequency or singleness of pitch. A pure tone shall exist if a 1/3 octave band's sound pressure level, including the tone, exceeds the arithmetic average of the sound pressure levels on the two contiguous 1/3 octave bands by 5 dB for 1/3 octave band center frequencies of 500 Hz and above, by 8 dB for center frequencies between 160 Hz and 400 Hz, and by 15 dB for center frequencies less than or equal to 125 Hz. In other words, the sound pressure level differences between the tone, and sound pressure levels for a specific range of frequencies both higher and lower than the tone, have to reach defined amounts, depending on the frequency of the tone, before a penalty, which depends on frequency, is applied.

## 2. Sound measurement study criteria

Sound pressure level measurements and related reporting shall satisfy the following:

- a. Follow contemporary standards of practice in acoustic science.
- b. Follow applicable International Organization for Standardization (ISO), American National Standards Institute (ANSI), and Acoustical Society of America (ASA) standards that apply to noise measurements.
- c. Sound pressure level measurement locations shall be developed in consultation with the Public Works Department. Sound pressure level measurements shall be made at locations that have received prior approval by the Public Works Department.
- d. Low frequency noise requirements shall meet ANSI S12.2 and S12.9 levels for low-frequency noise.

- e. Utilize instrumentation and methods that permit the development of both A-weighted and C-weighted sound pressure levels.
- f. The sound pressure levels at measurement locations shall be measured at a range of wind speeds, in approximate increments of 3-4 ft/s, between cut-in and up to the speed(s) corresponding to the rated turbine power levels.
- g. The background (pre-development) and compliance-period (post-development) sound levels shall be determined, as a function of wind speed, using not less than 500 determinations of the  $L_{A90,10}$ . Each such measurement must also satisfy the following criterion: during the measurement, the mean of direction(s) from the source(s) to the measurement locations and the mean of time-averaged wind direction(s) at the source(s) are within 45 degrees of one another. In other words, measurements are only valid when the wind is blowing from the source(s) toward the measurement location. In addition to satisfying this criterion, the difference in the two directions for each such measurement shall be recorded. These data and standard defensible regression methods shall be used to develop background and compliance-period sound levels as a function of wind speed for each measurement location.
- h. For each measurement location, the results of simulations of sound levels during facility operation shall be evaluated in the context of the background sound level function, which will generally be a smooth curve – valid only at that location – and the ordinance  $L_{A90,10}$  criteria.
- i. Results from compliance-period sound level monitoring for each measurement location during facility operation, which will generally yield a smooth curve – valid only at that location – shall be evaluated in the context of the background sound level function for that location, as determined above, and the ordinance  $L_{A90,10}$  criteria.
- j. For each measurement location, provide the number of data “triplets”, where a triplet consists of a background sound pressure level measurement, averaged for a specified period of time, the corresponding average wind speed at the facility site over the same time period, and the average angular difference identified above.
- k. Identify and explain regression methods used to develop background sound level as a function of wind speed at the facility site, and provide complete regression analysis results, including correlation coefficients.
- l. Measurement receivers shall be located on the property boundary and at other locations as identified by County staff.
- m. Sound measurements shall be made using industry-standard equipment, methods and techniques.
- n. Quantitatively address uncertainties present in sound pressure level measurements.
- o. Utilize outdoor sound pressure level measurements only.
- p. Use only those data corresponding to precipitation-free periods.
- q. Consider seasonality of prevailing wind direction that may be relevant to the selection of measurement periods and to the interpretation of measurement results.
- r. Provide descriptions of sound-level measuring equipment used (including microphones and windscreens), including manufacturer, model and type, as well as valid calibration records for equipment, microphones and windscreens.

- s. Address wind-induced microphone noise.
- t. Utilize narrow-band monitoring.
- u. Provide times and durations of monitoring.
- v. Provide descriptions of sound measurement locations, with microphone heights above ground, wind speeds, distances to nearest site features (buildings, trees, etc.), distances to nearest Renewable Energy Generation facility sources, discussion of audible sounds such as due to equipment/construction operations, landscape maintenance, seasonal sources (bird talk, insect sounds, leaf rustle), etc.
- w. Provide facility site atmospheric conditions – specifically wind speed at 10 m, as well as wind direction, barometric pressure, humidity and temperature.
- x. Provide measurement sampling duration(s).
- y. For post-development period monitoring, provide information on which sources were in operation.
- z. Provide graphs for each measurement location that indicate sound pressure level versus hub-height wind speed data, regression results, correlation coefficients, forecast sound level versus hub-height wind speed, and threshold criteria identified in the ordinance.
- aa. Provide electronic records in non-proprietary format, of sound pressure level time histories, unweighted spectra and corresponding weighted sound pressure levels.
- bb. Provide map(s) with locations of monitoring, as well as monitoring site photographs with equipment in the foreground and key site features in the background. Include the following:
  - (1) Indicate locations used for wind measurements and sound level measurements.
  - (2) Indicate locations of affected structures within two miles of any source.
  - (3) Provide coordinates for all locations identified herein.
  - (4) Indicate  $L_{A90}$  for each measurement point.
- cc. Furnish graphical and tabular data presentation, together with analysis and interpretation, to facilitate understanding by County staff, professionals and the public.