

**STAFF REPORT
ZONING BOARD OF ADJUSTMENT
Wednesday, November 16, 2016
6:00 p.m.
Montana Expo Park
Family Living Center
400 3rd St. NW, Great Falls, Montana**

UUP #03 & 04-2016

Applicant/Subject Property Information

Name of Applicant:	Fox Solar, LLC 3250 Park Blvd., Suite 355 Santa Monica, CA 90405
Name of Owner:	Pierce Properties, LLC PO Box 129 Ronan, MT 59864
Geo Code:	3015-27-1-01-28
Parcel Number:	2186180
Existing Zoning:	Suburban Residential (SR-1)
Acreage:	30 acres (two separate tracts)
Requested Action:	Approval of Unclassified Use Permit for the installation/operation of a photovoltaic solar power generation facility
Adjacent Land Zoning:	North: Residential (SR1) South: Residential (SR1) East: Residential (SR1) West: Flood Rd/Residential (SR1)
Adjacent Land Uses:	North: grassland, undeveloped/ residential shop South: private event center (commercial) / Residential Uses East: Residential Uses/ grassland, undeveloped West: Flood Rd / Railroad Tracks/ Intermittently Rail Car Storage

Existing Land Use: grassland, currently not developed

Applicable Regulations: Section 8.9, Section 8.12, and Section 18, Cascade County Zoning Regulations

General Information:

The Cascade County Zoning Board of Adjustment is in receipt of an Unclassified Use Permit Application from the Applicant Fox Solar, LLC (a company owned/operated by Cypress Creek Renewables) and property owner Pierce Properties, LLC for the installation/operation of a photovoltaic solar power generation facility. The applicant is requesting that an Unclassified Use Permit be granted as required by Section 18.1 (9) of the Cascade County Zoning Regulations.

Special Information:

The application materials submitted by Fox Solar, LLC along with the staff report, a copy of the legal ad, affidavit of mailing, agency information request, correspondence between the applicant and planning staff, proponent correspondence, opponent correspondence, and informational correspondence, were made available to the public at the Cascade County Public Works Planning Division Office located at 121 4th Street North, Suite 2H/I on Friday, November 4, 2016. Additionally at that time, this information was also made available electronically on the Cascade County Website under the Public Works Department, Planning Division Tab.

Unclassified Use Permit Considerations:

Pursuant to Sections 8.9, 8.12, and 18 of the Cascade County Zoning Regulations an Unclassified Use Permit is authorized for:

Section 8.9 Power Plants providing they meet the following conditions:

1. must meet all state, federal, and local regulations regarding the uses.
2. must not have any advertising signage attached to them.
3. must not interfere with any electrical components of neighboring properties.
4. must be fenced or protected to prohibit unauthorized access.
5. must be located at least 1000 feet from any use listed in 7.1.1.1 (2).

Section 8.12 Power Plant, Solar, providing they meet the following conditions:

Based on the typical solar power plant design, uses tend to be low in intensity with minimal trip generation, low amounts of impervious cover, and low emission thus the use may be compatible in both urbanized and non-urbanized areas throughout the County. Standards for power plant generation by solar energy shall be subject to the administrative requirements of Section 18 and the following site development standards:

- (1) Lot coverage: All buildings including accessory buildings shall not cover more than thirty-five percent (35%) of a lot unless adjusted by the Zoning Board of Adjustment.
- (2) Setbacks: solar power plant structures shall be set back from all property lines at least thirty (30) feet from the front and six (6) feet from the side yards, and ten (10) feet from a rear yard.
- (3) Landscaping Buffer: as determined by the Zoning Board of Adjustment through the Unclassified Use Permit process with considerations of location, size of parcel and topography of parcel. Appropriate landscaping and/or screening materials may be required to help screen the solar power plant and accessory structures from major roads and neighboring residences.
- (4) No solar power plant tower or other tall structure associated with a solar power plant shall be lighted unless required by the Federal Aviation Administration (FAA). When lighting is required by FAA, it shall be the red, intermittent, glowing-style, rather than the white, strobe-style.
- (5) Siting requirements of any structure within the Height Military Overlay District (HMOD) must be met. Any variance requested for over-height must be presented to Malmstrom's reviewing staff and approved.
- (6) Safety/Access: An appropriate security fence (height and material to be determined through the Unclassified Use Permit process) shall be placed around the perimeter of the solar power plant.
- (7) Signage: appropriate warning signage shall be placed at the entrance and perimeter of the solar power plant project.

- (8) Noise: No operating solar power plant shall produce noise that exceeds any of the following limitations:
 - (a) Fifty dBA, as measured at the property line of any neighboring residentially-zoned lot;
 - (b) Forty-five dBA, as measured at any existing neighboring residence between the hours of nine p.m. and seven a.m.
 - (c) Sixty dBA, as measured at the property lines of any other project boundary.

- (9) Agreements/Easements: If the land on which the project is to be leased rather than owned by the solar energy development company, all property within the project boundary must be included in a recorded easement(s), lease(s), or consent agreement(s) specifying the applicable uses for the duration of the project and a copy provided with an Unclassified Use Permit application.

- (10) Removal: Structures that remain nonfunctional or inoperative for a continuous period of one year shall be deemed to be abandoned, shall constitute a public nuisance and shall be removed by the owner/operator.

Section 18 Unclassified Use Permits, providing they meet the following requirements.

Unclassified uses shall be subject to all applicable property development standards of the district in which they are to be located and to the provisions outlined within this section. In addition, the following uses may be permitted by Unclassified Use Permits except for any use, including a power generating plant, which utilizes coal, coke, or other coal-based fuel as an industrial fuel source.

Unclassified uses are hereby said to possess characteristics of such unique and special forms that each use shall be considered as an individual case regardless of their underlying zone district.

An Unclassified Use Permit may be issued only upon meeting all requirements in these regulations for a specific use which is explicitly mentioned as one of the "Uses Permitted Upon Issuance of an Unclassified Use Permit" as provided in this section. After the public hearing is closed, the Zoning Board of Adjustment can approve, deny, or approve with conditions the Unclassified Use Permit. A separate Unclassified Use Permit shall be required per each tract of land. The Unclassified Use Permit fee shall be \$450.00.

Section 18.5 Standards Applicable To All Unclassified Uses

Before the Board of Adjustment can approve any Unclassified Use Permit, it must first reach each of the following conclusions: (Conditions may be required that the Zoning Board of Adjustment determines, if implemented will mitigate potential conflicts in order to reach these conclusions.)

- (1) The proposed development will not materially endanger the public health or safety

Considerations:

- a. Traffic conditions in the vicinity, including the effect of additional traffic on streets and street intersections, and sight lines at street intersections and approaches.
- b. Provision of services and utilities, including sewer, water, electrical, telecommunications, garbage collection, and fire protection.
- c. Soil erosion, sedimentation, and stormwater run-off
- d. Protection of public, community, or private water supplies, including possible adverse effects on surface waters or groundwater.

- (2) The proposed development is a public necessity, or will not substantially impact the value of adjoining property.

Considerations:

- a. The relationship of the proposed use and the character of development to surrounding uses and development, including possible conflicts between them and how these conflicts will be resolved.
- b. Whether the proposed development is so necessary to the public health, safety, and general welfare of the community or County as a whole as to justify it regardless of its impact on the value of adjoining property.

- (3) The proposed development will be in harmony with the area in which it is located.

Considerations:

- a. The relationship of the proposed use and the character of development to surrounding uses and development, including possible conflicts between them and how these conflicts will be resolved.

- (4) The proposed development will be consistent with the Cascade County Growth Policy.

Considerations:

- a. Consistency with the Growth Policy objectives for the various planning areas.
- b. Consistency with the municipal and joint land use plans incorporated by the Growth Policy.

Section 18.6 Operations

Operations in connection with the Unclassified Use Permits shall not be more objectionable to nearby properties by reason of noise, fumes, vibrations, or flashing lights, than would be the operation of any permitted use.

Findings with Respect to the Analysis Criteria:

Staff provides that the following analysis, findings and conclusion for each of the required criteria and conclusions provided under the controlling sections of the Zoning Regulations.

- 1. The proposed development will not materially endanger the public health or safety.***

Considerations:

- a. Traffic conditions in the vicinity, including the effect of additional traffic on streets and street intersections, and sight lines at street intersection and approaches.***

APPLICANT: The proposed solar farm will operate without employees on site, and the only vehicle trips generated will be quarterly maintenance inspections by technicians in a single vehicle. Fox Solar has presented studies and materials confirming the traffic will be minimal and relatively insignificant. Vehicle site visits will be required only 1 to 3 times per quarter. Tab 4 “Maintenance” & “Safety”¹, Tab 5. The project will not impede sight lines at intersections or approaches. The proposed location is set back from all intersections and approaches. Tabs 2 & 10. The applicant will work with the county to assure traffic safety during installation of the facility.

STAFF: Based upon the application materials submitted, the project is not expected to materially endanger the public health or safety with respect to traffic conditions in the vicinity including the proposed anticipated traffic involved with initial construction, and the proposed anticipated traffic generated once the facility is in operation.

- b. Provision of services and utilities including sewer, water, electrical, garbage Collections, and fire protection.***

APPLICANT: No water, wastewater, telecommunications, or garbage collection is required for the site after construction. Electrical service and the need for fire protection is minimal when compared with other permitted uses, such as public buildings or educational facilities. Tab 4, "Safety." The site will be monitored remotely and checked regularly by licensed electricians to ensure it is operating safely.

STAFF: The application materials demonstrate that the project will not affect the provision of services and utilities including sewer, water, electrical, garbage collection and fire protection based upon the application materials submitted, as this facility does not have a need for potable water, wastewater, telecommunications, or garbage collection after construction. Based on the landscape and buffer plan there would be a need for maintenance including watering in order to sustain the landscaping and buffering components. Fire Protection Services will be provided by Gore Hill Fire District.

c. Soil erosion and sedimentation.

APPLICANT: Fox Solar has submitted materials providing the measures that will prevent soil erosion, sedimentation, and stormwater run-off. Tabs 3 & 4. These include minimizing disturbed vegetation and soils, employing sediment basins and drainage features, and performing erosion control measures. Tab 4, "Stormwater Erosion and Sediment Control" & "Soil Protection." A detailed erosion and sedimentation control plan is developed for every project. Tab 4, "Soil Protection." Local vegetation is planted across the site, which will also prevent any issues in this area. Tab 4 "Dust and Weed Control."

STAFF: The application materials proposal for stormwater management as well as required compliance with Montana Department of Environmental Quality (MDEQ) regulations would indicate that the project will not affect soil erosion and sedimentation, either during the construction phase or after construction during the operational period based upon a detailed erosion and sedimentation control plan. The applicant does not intend to compact soils, which can prevent water from entering the ground thus causing an increase in runoff. During construction, temporary erosion and sedimentation will be mitigated through straw bales, hay coil logs, run-off channels, silt fencing and sediment basins. Natural vegetative growth is encouraged after construction and the soil the panels are placed on is not considered impervious. Erosion during construction due to dry conditions or wind will be controlled by limiting heavy equipment traffic and keeping the roads wet to reduce dust. Montana Department of Environmental Quality is the authority that administers Storm Water permits locally. The applicant will need to obtain a Storm Water permit from MT DEQ for construction activities including grading, clearing, excavation or other earth disturbing activities that disturb one or more acres.

d. Protection of public, community, or private water supplies, including possible adverse effects on surface waters or groundwater.

APPLICANT: No water supplies will be affected by the project. As explained above, extensive measures will be taken to avoid soil erosion, sedimentation, and stormwater run-off. Tabs 3 & 4. The materials used in the project are not toxic. Tab 4, "No Toxicity." The Missouri River is approximately .8 miles away from the project and will not be affected. See <http://svc.mt.gov/msl/mtcadastral/>.

Fox Solar has satisfied all necessary requirements. No information in the record rebuts any of these required elements.

In addition to the required considerations above, Fox Solar has presented additional information regarding the safety of the facilities. They are built according to applicable codes and specifications by the utility and include a safety fence. For additional details, see Tab 4, "Safety." Soil is also protected. Tab 3 & 4, "Soil Protection." There are no electro-magnetic fields (EMFs) outside safe limits. Tab 4, "Electro-Magnetic (EMF)." Fox Solar has also submitted a decommissioning plan; however, this is not expected for more than 30 years. Tabs 4, "Decommissioning" & 9.

Fox Solar has also obtained a Determination of No Hazard to Air Navigation from the Federal Aviation Commission. See Tab 8.

STAFF: The project will not interfere with the protection of public, community, or private water supplies, including possible adverse effects on surface waters or groundwater based on the application materials submitted and the requirements of compliance with the MDEQ regulations regarding these criteria. In addition, there are no surface waters or community water supplies in the near vicinity of the project. The panels do not contain toxic materials that could contaminate water supplies including surface water or groundwater.

2. The proposed development is a public necessity, or will not substantially impact the value of adjoining property.

Considerations:

a. The relationship of the proposed use and the character of the development to surrounding uses and development, including possible conflicts between them and how these conflicts will be resolved.

b. Whether the proposed development is so necessary to the public health, safety, and general welfare of the community or

County as a whole as to justify it regardless of its impact on the value of adjoining property.

APPLICANT: This requirement is satisfied as shown by the impact studies and endorsements of these studies. The project is approximately 30 acres which includes two different array areas. Tab 2. The project's landowners own parcels on the north, south, and east of the property. Tab 2. I provided an impact study as Tab 6 by Richard C. Kirkland, Jr., MAI of Kirkland Appraisals, LLC. This study proves that the installation of a solar project does not have a substantial impact on adjoining property and is in harmony with agricultural and residential uses. Tab 5.

I have also attached a letter from Montana general certified appraiser Tim Moore, MAI of Moore Appraisals, Inc. in Helena, Montana, which states "that the proposed projects will not substantially impact the value of the adjoining property and, that given the lack of impact from noise, traffic, odor, etc., the proposed developments will be in harmony with the area in which they are located." Tab 6, pg. 3. The letter is based on a very similar study by Mr. Kirkland, which is included with Tab 7. We plan to submit an updated letter from Mr. Moore as soon as it is available.

Mr. Kirkland's studies have also been endorsed by William M. Miller, MAI of Real Property Consultants in Medford, OR. His letter is attached as Tab 7 for the Board's consideration with the referenced study.

The studies are directly on point and provide a solid basis for approval of the project. The studies considered property very similar to the property at issue here, including multi-acre parcels surrounded by agricultural and residential use (for example the Alamo II project in San Antonio, TX; AM Best Solar project in Goldsboro, NC; and the Mulberry solar project in Selmer, TN). For example Tab 5, pgs. 9, 12-23. These studies include the impact of solar facilities that are "clearly visible" by the adjoining properties. See Tab 5, pgs. 13, 22-23.

Similarly, the facility proposed by Fox Solar is surrounded by property zoned SR-1, which allows for residential use, general agricultural uses, and limited agricultural uses as permitted principal uses. Cascade County Zoning Regs. 7.1.2.1. The proposed Fox Solar project is similar to the solar facilities in the studies, and some cases is smaller in size. For example Tab 5, pg. 4.

The studies show that the solar farms have had "no impact on sale price for residential, agricultural, or vacant residential land that adjoins or abuts the existing solar farms included in [the] study." Tab 5, pg. 12. They demonstrate that homes in the studied areas are appreciating or selling with no impact on sellout rate or time required to sell. Tab 5, pgs. 12, 14, 23.

It is also important to note this type of study is not yet feasible within Montana, as we are unaware of any similar solar project here. However, Cascade County has operating wind farms, which should further inform the Board's conclusion that proposed solar facility will not have substantially impact adjoining property values.

Wind farms are much more intrusive than solar farms and have a greater impact on viewshed, for example. However, a number of studies show “[r]egardless of model specification, we find no statistical evidence that home values near turbines were affected in the post-construction or post-announcement/pre-construction periods.” *A Spatial Hedonic Analysis of the Effects of Wind Energy Facilities on Surrounding Property Values in the United States*, U.S. Department of Energy (Aug. 2013). These studies are available at <http://www.realtor.org/field-guides/field-guide-to-wind-farms-their-effect-on-property-values> and are incorporated by reference into the record for the Board’s review.

No evidence in the record indicates that the proposed facility would reduce the value of adjoining properties. The desire to maintain current views, or the desire that the land be used for another purpose, is not evidence of a “substantial impact” on value. It is also important to note the view surrounding the proposed site is not unblemished. The view shed also includes a railroad track, substation, and other visible construction. See <http://svc.mt.gov/msl/mtcadastral/>. However, in an effort to work with adjoining property owners, Fox Solar remains committed to communicating with them regarding appropriate screening.

The proposed project satisfies this requirement for UUP application approval. No information in the record rebuts these studies or endorsements.

STAFF: The proposed development is not a public necessity. Staff finds that the application materials, the impact analysis performed, and the proposed mitigation techniques collectively can be found to demonstrate that the proposed development will not substantially impact the value of adjoining property. The application materials included an impact study which was conducted by Richard Kirkland of Kirkland Appraisals, LLC. Mr. Kirkland used statistics throughout the United States in similar demographics of which he has appraised over 200 solar project impacts. While he states that he has not been asked to assign any specific value to any specific property, he has used neighborhood analysis and paired sales analysis for the basis of his conclusions. The impact study that was put together by Kirkland Appraisals, LLC has been evaluated and reviewed by Tim Moore of Moore Appraisals Inc located in Helena, MT as well as William M. Miller of Real Property Consultants located in Medford, OR. Both individuals reviewed Mr. Kirkland’s impact study and his “paired sales analysis” which researched and analyzed sales of single family properties adjacent to or nearby solar farms and compared them to sales that are similar but do not have a potential valuation influence from the solar project. Both individuals supported and endorsed Mr. Kirkland’s analysis and conclusions that there is no support for any impact on the value of adjoining property.

The applicant has expressed that the proposed development is not necessary to the public health, safety, and general welfare of the community or County as a whole as to justify it regardless of its impact on the value of adjoining property.

3. The proposed development will be in harmony with the area in which it is located.

Consideration:

a. The relationship of the proposed use and the character of the development to surrounding uses and development, including possible conflicts between them and how these conflicts will be resolved.

APPLICANT: The same study by Mr. Kirkland, MAI and additional information presented by Fox Solar, and the facts regarding permissible and existing uses of the surrounding area demonstrate Fox Solar has satisfied this requirement. The study notes that agricultural and residential use are the most common uses of property surrounding solar facilities. Tab 5, pg. 1. It states “[t]he data [Kirkland Appraisals, LLC] collected and provide in [its] report supports the compatibility of solar farms with adjoining agricultural and residential uses.” Tab 5, pg. 24. This is confirmed in the letter provided by Moore Appraisals, Inc. Tab 6, pg. 3.

The detailed analyses of the factors impacting harmony of use, also demonstrate Fox Solar’s proposed project satisfies this requirement:

Hazardous material: There is no potential hazardous waste byproduct as a part of normal operations and there are no pending environmental impacts associated with development and operation. Tab 5, pg. 27. The panels contain no toxic materials. Tab 4, “No Toxicity.”

Odor: Solar farms do not produce any noticeable odor. Tab 5, pg. 27.

Noise: There is no audible sound from the facilities at appropriate setbacks, which are contemplated in the Fox Solar project. Tab 5, pg. 27; Tab 4, “Audibility.”

Traffic: Vehicle site visits will be minimal and are required only 3 times per quarter. Relative to other permitted principal uses, traffic will be insignificant. Tab 5, pg. 27; Tab 4, “Maintenance” & “Safety.”

Stigma: Solar facilities do not suffer from any specific stigma and are generally favored. Tab 5, pgs. 27-28.

Appearance: The visual impact of a solar facility is similar to a greenhouse, which is a permitted use under the Cascade County Zoning Regulations. Tab 5, pg. 28; Cascade County Zoning Regs. 7.1.2.1. The panels are shorter than a typical residential dwelling, which is also a permitted use in this area. Tab 7, pg. 28; Cascade County Zoning Regs. 7.1.2.1. The panels are treated with an anti-reflective coating, and produce an effect similar to a body of water. Tab 4, “Glare”. The

Missouri River is present in photos of the site taken by Planning Staff. Tab 10. This body of water is already in the viewshed, and the proposed project will produce a similar effect.

It is also essential to note that under SR-1, property in the area may be used for public buildings, educational facilities, or public institutions. Cascade County Regs. 7.1.2.1. It may be put to general agricultural uses, including raising hogs, dairy and beef cattle, and goats, or producing livestock products for the production of income. Cascade County Zoning Regs. 7.1.2.1 & Section 2 "Agricultural Use." The proposed facility will create far less construction, noise, traffic, odors, or hazardous materials than these permitted uses. It will be less visible and will mitigate any resulting disturbance to the viewshed.

In addition, the surrounding area already includes other uses of land, such as an electrical substation owned by NorthWestern Energy Corporation and a railroad. Fox Solar will connect to this substation as part of its operation. Accordingly, electrical facilities are already onsite, permitted by the County, and considered by adjoining land owners.

The proposed facility is in harmony with the surrounding area. It cannot be reasonably argued that the proposed facility does not meet this prong.

STAFF: With nearby Suburban Residential (housing and common accessory buildings, sheds, shops, garages), Worship Facilities (Churches), Education Facilities (Small Private School), Agricultural (horses, grazing land), Commercial (communication tower, private event center), Industrial (railroad, storage of rail cars on existing tracks) and Utility (electrical substation, overhead electrical power lines, residential solar structures, residential wind structures) type uses visible throughout the area, it appears that the project as presented could be considered to be in harmony with the surrounding area which does include a variety of uses other than just suburban residential. The Cascade County Zoning Regulations allow by right several permitted principal uses within SR1 that could be considered to be less harmonious with the surrounding area zoning and surrounding area uses. For example, Educational Facilities, Public Buildings, Day Cares, Group Homes, Day Care Centers, Retirement Homes, Nursing Homes, and Public Institutions; all of which have the potential to have significant traffic volumes, noise, lights, glare, etc. that could be deemed to be less harmonious with the surrounding properties than the use proposed with this application. With the small size of this solar powered electrical generation facility that is proposed, the minimal impact from traffic, noise, glare, etc that this facility would produce during operation, along with the mitigation techniques proposed for softening the impact of its presence, staff finds that the proposed development can be considered to be in harmony with the area in which it is located.

4. The proposed development will be consistent with the Cascade County Growth Policy.

Considerations:

a. Consistency with the Growth Policy objectives for the various planning areas.

b. Consistency with the municipal and joint land use plans incorporated by the Growth Policy.

APPLICANT: The proposed project is directly in line with the County's Growth Policy. It provides local investment to produce renewable, emission-free clean energy. The project will sustain and strengthen the economic well-being of the community by bringing local investment, a diversified and increased tax base, construction jobs, and increased demand for local business to Cascade County. It will protect and maintain the character and historic relationship with natural resource development, maintain the agricultural economy, and preserve and enhances the rural, friendly and independent lifestyle of Cascade County.

STAFF: The applicant has responded to the goals and objectives of the Cascade County Growth Policy 2014 update.

GOAL 1: Sustain and strengthen the economic well-being of Cascade County's citizens.

A. Stimulate the retention and expansion of existing businesses, new businesses, value-added businesses, wholesale and retail businesses, and industries including agriculture, mining, manufacturing/processing and forest products.

APPLICANT: Generally, the construction of the proposed solar farm will create opportunities for temporary high paying construction related jobs, thereby stimulating the local economy. Local businesses will likely be utilized for supplies, lodging, meals, and other goods and services during the 6-12 week period during construction. The project creates possibilities for local landscape maintenance to be hired for long-term ongoing weed mitigation and vegetation maintenance. Increased solar technology installed in Cascade County and the development of the facility advance the market for solar jobs in Montana. The energy produced will help meet regional demands including those from employment centers and businesses in Cascade County.

STAFF: The project could be considered to stimulate the retention of existing businesses in that existing companies may be used for construction and maintenance. A local landscape company may be hired to work on or complete the landscape buffer, an arborist may be hired as a consultant due to their knowledge of native trees, shrubs and grasses that grow well in the region. Expansion of existing businesses would be

short term due to the initial construction and possibly expansion of existing businesses due to maintenance needs of the proposed facilities. The other types of business such as new businesses, value added businesses, wholesale and retail businesses and industries including agriculture, mining, manufacturing/processing and forest products would probably not be impacted positively or negatively by this application. The plant may increase solar technology by promoting further expansion in the county of these types of facilities.

B. Stabilize and diversify the county's tax base by encouraging the sustainable use of its natural resources.

APPLICANT: The proposed solar farm will help stabilize and diversify Cascade County's tax base by providing increased long term additional revenue and by producing renewable emission-free energy from a sustainable resource: the sun. Once installed, the facility will be valued and taxed as commercial property and business equipment, which should increase the tax revenues to Cascade County for years to come. The Department of Revenue estimated a ten-year tax revenue of more than \$324,000 for a similar project to be installed in Lewis & Clark County, considering tax abatements. This estimate is attached as Tab 11. A similar estimate will be provided to the County if the project moves forward and will depend on the specifics of the project. The proposed land is currently classified as nonqualified agricultural land, which returns substantially lower tax revenues. The natural resource values from retaining the soil quality will continue after the life cycle of the facility, and thus sustain those natural resource values. Tab 4, "Soil Protection."

STAFF: Based on the application materials submitted, the county's tax base would be helped by the diversity of this industry as Cascade County does not have commercial solar facilities. These would promote stabilizing the tax base as there would be an increase due to the property being taxed as commercial property and business equipment. This would be a higher tax than is currently being assessed on the land which is classified nonqualified agricultural land. In comparison, the value of this land would also increase if it were built out to full Suburban Residential housing units thus also stabilizing the tax base but not diversifying it.

C. Identify and pursue primary business development that complements existing business, which is compatible with communities, and utilizes available assets. Identify and pursue targeted business development opportunities to include, but not limited to, manufacturing/heavy industry, telecommunications, and youth/social services.

As stated above, the proposed solar farm will benefit the local economy by creating opportunities for local construction and maintenance jobs, and the generation of renewable energy that will be utilized locally to offset carbon emissions. It is compatible with (in harmony with) the community in which it is proposed, as shown in

the materials submitted with the application. Tabs 4-6. The facility utilizes available land in a manner that will increase and diversify County tax revenues.

One of the concerns voiced from members of the public is the potential impact of the facility on property values. Please see the study and supporting letters regarding solar farm impact on property values and supporting letters in Tabs 5-6. As explained above, this information shows “the proposed projects will not substantially impact the value of the adjoining property and, that given the lack of impact from noise, traffic, odor, etc., the proposed developments will be in harmony with the area in which they are located.” Tab 6, pg. 3.

In addition, a 2014 study of the impacts of wind generation facilities on property values has been compiled.² After evaluating 50,000 residential real estate transactions near wind generation facilities in 27 counties across nine states, the study’s authors found, “no statistical evidence that home prices near wind turbines were affected in either post-construction or post-announcement/pre-construction periods.” While wind generating facilities are different from solar farms, we feel wind facilities would have a higher impact on real estate prices than solar facilities due to turbine heights having greater visibility over long distances. Based in part on this study and on our experience across the US, we feel the solar facility is compatible with neighboring development in part because it will not have a negative impact on home sales or property values in the area.

STAFF: Based on the application materials submitted, the project could be considered to identify and pursue business development that complements existing businesses. The existing businesses may be used for the construction and maintenance of one the first solar generating power plants facilities. This also identifies and pursues a new business development around solar generation facilities in Cascade County. It would also be expected that business development would be compatible with communities and utilize available assets as using local products would be preferred. Identifying and pursuing targeted business development opportunities to include, but not limited to manufacturing/heavy industry, telecommunications and youth/social services would not be impacted positively or negatively by this application.

D. Promote the development of cultural resources and tourism to broaden Cascade County’s economic base.

The proposed solar farm is compatible with cultural or natural resources and will not be contrary or interfere with Cascade County’s recreational and tourism economy. The renewable energy produced has environmental benefits, such as carbon offset and sustaining clean air, land, and water. These environmental benefits, as clean energy, promote the cultural and natural resource values, and thus help promote and further the tourism industry in Cascade County.

STAFF: Based on the application materials submitted, the project is not expected to promote the development of cultural resources as the project does not have any

historic buildings or cultural value at the location proposed and would not broaden Cascade County's economic base. Also, this project is not expected to promote tourism and therefore will not have an immediate impact on tourism to broaden Cascade County's economic base.

E. Foster and stimulate well-planned entrepreneurship among the county's citizenry.

Renewable energy production in the form of solar facilities locating on resource land is a new industry in Cascade County. Not only will the technology and development of the facilities create the opportunity for jobs, but the energy produced at this site will contribute to the regional economy without any pollution.

STAFF: Based on the application materials submitted, the project may foster and stimulate well-planned entrepreneurship among the county's citizenry. While it does bring new ideas, technology, and energy production to the county, it cannot be determined if this will foster or stimulate well planned entrepreneurship among county citizens. This new industry has the potential to stimulate current farmers/ranches to explore this type of energy production, during a time when agriculture prices are at a low.

F. Promote a strong local business environment. Encourage and strengthen business support mechanisms such as chambers of commerce, development organizations and business roundtable organizations.

As discussed, renewable energy production in Cascade County will strengthen the local economy by helping to meet the energy demands of Cascade County, diversifying and increasing the County's tax base, and creating opportunities for local jobs. This in turn strengthens the business environment in Cascade County.

STAFF: Based on the application materials submitted, the project may promote a strong local business environment, by encouraging and strengthening business support mechanisms such as chambers of commerce, development organizations and business roundtable organizations as this is a new industry to the county. By having a solar power plant, other similar business models and plans may be brought to Cascade County. This project could be used as a template model and as a business model for other companies to bring proposals to Cascade County.

G. Improve local trade capture for Cascade County businesses. Promote local shopping as well as well-planned businesses and new businesses.

As mentioned, renewable emission-free energy production in Cascade County will help in efforts to capture local trade for businesses by helping to meet the energy demands of the community. The project creates the potential for local contractors to

be part of the construction and maintenance of the facility. The contractors will likely spend money in the local economy, thereby increasing economic activity and supporting other jobs in Cascade County.

STAFF: Based on the application materials submitted, this project would improve local trade capture for Cascade County businesses, as existing businesses may be utilized for construction materials or other necessities. Those items may be purchased locally which would promote local shopping and well planned businesses or new businesses as stores may diversify what they offer or current product lines they carry to meet the needs of the solar generation facility and the workers. It is not projected that the project would promote new businesses as the demand for miscellaneous purchases is not anticipated to be high in volume.

H. Network with and support other economic development efforts in the region and statewide, in recognition of Cascade County's interdependence with other communities and to leverage available local resources.

This project furthers the Governor Bullock's Energy Blueprint, which is a statewide economic development effort that includes a "goal . . . to double the current solar development in the state by 2025." The plan is available at <https://governor.mt.gov/Newsroom/ArtMID/28487/ArticleID/4325>. The applicant is new to Cascade County, and is willing to network with and support other economic development efforts in the County recognizing community values and to assist in leveraging available local resources.

STAFF: Based on the application materials submitted, the project would be a starting point to build a network with and support economic development efforts in the region and statewide, as the solar industry is new to Cascade County and Montana. Cascade County may be able to provide a statewide model that hopefully brings local resources such as construction, landscape and electrical workers or businesses to fill jobs that are available when bringing clean energy to their communities. As wind energy development in Cascade County has led to economic development efforts, collaboration with local educational facilities, and an increase in networking amongst professionals, solar projects of this type may also lead to similar results.

I. Encourage the growth of the agricultural economy.

The facility is compatible with agricultural uses in surrounding property. It is a safe, quiet, low-profile, environmentally friendly option, which will not impact the agricultural use of the surrounding property. See Tab 4-6. In comparison with other land uses that are allowed in this district, such as residences, a Solar site will not generate conflicts with nearby agricultural landowners because there will be no complaints regarding herbicide and pesticide use, no conflicts with cattle moving down county roads, no

conflicts over irrigation or fencing, or other potential concerns. Noxious weed will be managed and the soils will be conserved for future agricultural production.

According to a Finding in Cascade County's Growth Policy Update, Economic Condition 5, "... some farms have found they support their main agricultural endeavor farming and lease out portion of their ground to support wind energy." In terms of wind energy, state research has shown there are several environmental benefits for the environment, including the removal of tons of carbon dioxide.

Renewable clean energy from solar allows agricultural owner to better weather the bad years of farming, and enhancing the sustainability and longevity of the remaining agricultural use.

STAFF: Based on the application materials submitted, the growth of the agricultural economy would not be affected positively or negatively. The proposed location for this site is not in the vicinity of any large agricultural operations and would not have an impact. The growth of the agricultural economy may not be encouraged in the County, as farmers and ranchers are facing low returns on agricultural products and may attempt to incorporate a solar farm on what once was a high dollar wheat field or cattle operation in order to cut losses.

J. Stimulate the growth of the economy by encouraging the use of alternate methods of energy production, including wind energy.

This facility is exactly the type of project Cascade County's Growth Policy seeks under this objective. The proposed solar farm will stimulate the growth of the economy by being an alternative method of producing renewable energy, as described above, by creating the possibility of local jobs, increasing local demand for services, increasing and diversifying the County's tax base, and helping meet Cascade County's growing energy needs. See Tabs 4, 11.

STAFF: Based on the application materials submitted, the project would stimulate the growth of the economy by encouraging the use of alternative methods of energy production, but rather than including wind energy, this energy production includes solar energy.

Goal 1 of the Growth Policy analysis by staff, concludes the applicant has demonstrated relative information for a determination that they have met, in part or in whole, objectives A, B, C, D, F, H and J. With regards to Goal 1, Objective E to "foster and stimulate well-planned entrepreneurship among the County's citizenry", and Objective G to "improve local trade capture for Cascade County businesses. Promote local shopping as well as well-planned businesses and new

businesses”, staff finds that these are subjective for the application submitted. Analysis of Objective I, “encourage the growth of the agricultural economy,” it can be found that this project does not hinder or promote the agricultural economy.

GOAL 2: Protect and maintain Cascade County’s rural character and the community’s historic relationship with the natural resource development.

Objectives:

A. Foster the continuance of agriculture and forestry in recognition of their economic contribution and the intrinsic natural beauty of grazing areas, farmlands and forests.

The solar project is completely compatible with farming and other agricultural uses in the area by not creating air or noise quality or glare issues. In effect, the land use is a non-traditional type of agriculture that harvests renewable energy from the sun without the use of herbicides, pesticides, irrigation water or fertilizers. As explained in the application materials, the facility will include local vegetation, is not toxic, will protect soil and wildlife, and will prevent storm-water runoff. See Tab 3-4. The project is will not cause any change or increase in the cost of surrounding agriculture.

STAFF: Based on the application materials submitted, the project does not positively or negatively foster the continuance of agriculture and forestry in recognition of their economic contribution and the intrinsic natural beauty of grazing areas, farmlands and forests as the project is not proposed near agriculture or forestry operations. Therefore, it is not expected to have a positive or negative effect of their economic contribution nor the intrinsic natural beauty of grazing areas, farmlands, and forests.

B. Preserve Cascade County’s scenic beauty and conserve its forests, rangelands and streams, with their abundant wildlife and good fisheries.

The site is located away from the Missouri River and Interstate 15. No forests, rangelands or streams will be affected by the proposed solar farm. As explained in the application materials, the facility will include local vegetation, is not toxic, will protect soil and wildlife, and will prevent storm-water runoff. See Tab 3-4.

STAFF: Based on the application materials submitted, the project would conserve Cascade County’s forests, rangelands and streams, with their abundant wildlife and good fisheries. The panels are not toxic, and are not expected to have a detrimental impact. There is reasonable evidence that this objective will be met with the implementation of proposed mitigation conditions.

C. Preserve Cascade County’s open space setting by encouraging new development to locate near existing towns and rural settlements and by

discouraging poorly designed, land subdivisions and commercial development.

The proposed solar facility is located in an existing rural settlement less than one mile from urban development. The project is well designed by licensed engineers and landscape architects and experts. This project does not represent urban sprawl and will not have any of the typical impacts of poorly designed subdivisions or commercial developments. It is compatible with surrounding land uses, as demonstrated in the application materials. See Tab 4-6.

STAFF: Based on the application materials submitted, there is reasonable evidence that this goal to preserve Cascade County's open space setting by encouraging new development to locate near existing towns and rural settlements and by discouraging poorly designed, land subdivisions and commercial development is met by this proposed use. The tracts of land proposed for this development would amount to infilling and are located near the existing Great Falls community.

D. Assure clean air, clean water, a healthful environment and good community appearance.

The solar project is completely compatible with farming and other uses in the area by not creating air, water, land, or noise quality or glare issues. The facility will include local vegetation, is not toxic, will protect soil and wildlife, and will prevent storm-water runoff. See Tab 3-4.

STAFF: Based on the application materials submitted, the project should not inhibit the assurance of clean air and clean water, a healthful environment and good community appearance. This is a reasonable finding with the implementation of proposed mitigation conditions. While producing energy in a way that reduces carbon emissions, Cascade County is promoting a green energy resource. The applicant also plans to install a landscape buffer around the facility which may help promote good community appearance of the facility within the county, by surrounding the site with local vegetation and trees.

E. Support the development of natural resources including but not limited to timber, mining, oil and gas production, and renewable energy production.

Again, this facility is precisely the type of project the Cascade County Growth Policy seeks under this objective. The proposed use is to produce renewable energy from natural resources with the use of photovoltaic solar panels.

STAFF: Based on the application materials submitted, the project supports the development of natural resources in renewable energy production.

F. Continue to work with federal and state agencies to redevelop properties within Cascade County which are currently undergoing Superfund and Brownfields process.

The subject property is not a Superfund or Brownfields site. Due to the lack of toxins, fuels or other contaminants, the project will not create a new Superfund or Brownfield site.

STAFF: Based on the application materials submitted, this use would not have an impact positively or negatively on this goal.

Goal 2 of the Growth Policy analysis by staff, concludes the applicant has demonstrated relative information for a determination that they have met, in part or in whole, Objectives B, C, D, and E. Objective A “foster the continuance of agriculture and forestry in recognition of their economic contribution and the intrinsic natural beauty of grazing areas, farmlands and forests” is not promoted or hindered by the proposed use. Objective F does not apply to this application as this site is not a Brownfield or Superfund site.

GOAL 3: Maintain Agricultural economy

A. Protect the most productive soil types.

The proposed solar farm will protect productive soil types. The application materials provide detailed information regarding the methodology Fox Solar will utilize to ensure soil compaction is mitigated, and stormwater erosion and sediment are controlled. See Tabs 3-4.

In addition, no prime farmland soils being impacted by the proposed solar farm. Attached as Tab 12 is the NRCS Custom Soil Resource Report for Cascade County Area, Montana and as Tab 13 the corresponding Fox Area Soil Map. The two predominate soil types making up the proposed solar area is 68% Marias silty clay (141), which is rates as “not prime farmland.” Another 26.7% of the proposed solar area is Kobar silty clay (115), which is “prime farmland if irrigated.” The subject property is not being irrigated at this time. As explained in the application materials, the soil will protected and available for use, if and when the project is no longer in use. Therefore, the most productive soil types are preserved for future use.

STAFF: Based on the application materials submitted, there are no soil types that are prime farmland, except for one type, if irrigated. However, there is not irrigation on that property at this time. The current use of the land is not being farmed but could be considered available to be grazed if the owners desired. The proposed use will prevent this property from being used for agricultural purposes in the area in which the panels would be located.

B. Continue to protect soils against erosion.

Fox Solar submitted an erosion, sediment, and soil compaction plan that demonstrates the methods employed to manage soils onsite. Tabs 3-4. Solar farms are low impact and the site will be reseeded to restore all temporary disturbance after construction.

STAFF: Based on the application materials submitted, the proposed use will continue to protect soils against erosion. Any disturbed soils will be reseeded after construction, a landscape buffer will be completed to help against soil erosion, and all storm water run-off will be required to be kept on-site. The applicant will have to maintain the site properly in order for proposed landscaping and buffer areas to remain in a condition that would prevent and protect soils against erosion.

C. Protect the floodplain from non-agricultural development.

The proposed solar farm is not within the floodplain.

STAFF: Based on the application materials submitted and review of the sites by the Cascade County Floodplain Administrator, the proposed solar facility is not located within the 100 year FEMA regulated floodplain and will protect the floodplain from nonagricultural development.

D. Support the development of value-added agricultural industry in Cascade County utilizing the products from the regional area.

Local products, where available, will be utilized. Again, the solar project is completely compatible with farming and other uses in the area by not creating air, water, land, or noise quality or glare issues. The facility will include local vegetation, is not toxic, will protect soil and wildlife, and will prevent storm- water runoff. Tabs 3-4.

STAFF: Based on the application materials submitted, the project will not utilize agricultural products from the regional area. There is no evidence that this proposal will support the development of value added agricultural industry in Cascade County.

Goal 3 of the Growth Policy analysis by staff, concludes the applicant has demonstrated relative information for a determination that they have met, in part or in whole, Objective B with proper maintenance, and Objective C by not being located within the floodplain. It does not meet Objective A as the tracts of land will not be used for agricultural use, and it does not meet Objective D as it would not support the development of value-added agricultural industry in the County utilizing the products from the regional area.

GOAL 4: Retain the presence of the US Military in Cascade County.

Objectives:

- A. Encourage the federal congressional delegation to actively support maintaining the current mission status at a minimum.***
- B. Promote the location of additional military missions in Cascade County.***
- C. Encourage the reactivation of the runway at Malmstrom Air Force Base for fixed wing operations.***
- D. Refer to the Joint Land Use Study for resolving conflicts and promoting mission compatible development.***

Goal 4 and its Objectives A through D relating to US Military facilities in the county are not directly applicable to the proposed solar farm. The proposed solar farm is completely compatible with these objectives. It has been reviewed by the F.A.A. and no concerns have been identified. See Determinations of No Hazard to Air Navigation. Tab 8

STAFF: Based on the application materials submitted, the proposed solar farm will not impact US military facilities in the county and the solar farm is compatible with the above objectives.

Goal 4 of the Growth Policy analysis by staff concludes that the project does not impact positively or negatively the military's presence in Cascade County.

GOAL 5: Preserve and enhance the rural, friendly and independent lifestyle currently enjoyed by Cascade County's citizens.

Objectives:

A. Maintain Cascade County's citizens independent lifestyle and minimize local governmental intervention, to the extent possible, consistent with the requirements of a continually evolving economy and constantly changing population.

The introduction of solar facilities does not impede the independence of Cascade County residents and does not require local government regulation or intervention. It also fits within evolving industry in Cascade County and reflects the independent lifestyle of a changing community. The facility is new to Cascade County, will increase and diversify County tax revenues for years to come, and provides power for Cascade County's changing population.

STAFF: Based on the application materials submitted, it would be expected that the project would not interfere with the ability to maintain Cascade County's citizens independent lifestyle and minimize local government intervention due to increasing the diversity of the economy.

B. Preserve and promote Cascade County's rich cultural heritage, rooted in natural resource development and reflected in its numerous cultural/historic sites and archaeological areas.

The proposed solar facility is exactly what the County's Growth Policy seeks under this objective. The solar facility develops the County's natural resources, which the objective states is the root of the County's rich cultural heritage. The facility will accomplish exactly what this Policy intends.

STAFF: Based on the application materials submitted, this project would not have an impact on preserving or promoting the county's rich cultural heritage or cultural/historic sites as this proposed site does not have any historical or cultural significance. The proposed use by this application would promote natural resource development.

C. Promote fire prevention measures throughout the county, giving special emphasis to the extreme fire hazards present at the wild land/urban interface.

The proposed solar farm is designed with fire prevention in mind. It is built to comply with the National Electric Code. Inverters will be provided with exterior shut off switches that will not require the use of ladders or stairs for access. The Great Falls Fire Department's fire station is located less than 3 miles from the project. All vegetation on site will be consistently maintained and weeds will be controlled and eliminated. Panels will be constructed and installed in standards practice. The proposed use will not significantly increase fire hazards or significantly increase fire suppression cost or significantly increase risks to fire suppression personnel.

STAFF: Based on the application materials submitted, the project is considered to meet this objective as the proposed use will not increase fire hazards significantly, and may be considered a good location given the close proximity of the Fox Farm Fire Station of the Gore Hill Fire District.

D. Encourage the continued development of educational programs and facilities, recreational opportunities and spaces and health services for all county residents.

Opportunities to educate and inform the local community on renewable energy production through the use of solar will be available during the review and development of the project. The applicant has explored the opportunities to partner with the local school district. April Senger a High School Science teacher in Great Falls has relayed all of her experience and progress with solar and education for her students. She has also offered several educational opportunities for the applicant to explore.

In addition, the facility will significantly enhance the tax base while requiring few public services. For example, the facility will not result in significant impacts to county roads or students requiring public educational services. Attached as Tab 14 is a spreadsheet showing tax revenues to local and state governments from wind energy

sites in Montana. While wind harvesting is different from solar harvesting in terms of the taxable values, this spreadsheet provides a basis for evaluating potential tax revenues.

STAFF: Based on the application materials submitted, the project would support the continued development of educational programs and facilities specifically with respect to local educational interactions. The project would probably not have a significant impact on increasing recreational opportunities and health services for all county residents.

Goal 5 of the Growth Policy analysis by staff, concludes the applicant has demonstrated relative information for a determination that they have met, in part or in whole, Objectives B, C, and D. Objective A “Maintain the citizen’s independent lifestyle or minimize local governmental intervention” would not have an effect.

STAFF: Based on the application materials submitted, staff finds that the application can be considered to be generally consistent with the applicable Growth Policy goals and objectives and the use could be determined to be in conformity with the application of the analysis of the Growth Policy. Staff also finds that the application is consistent with our municipal and joint land use plans incorporated by the Growth Policy, specifically the Joint Land Use Study and the Development Coordination Area as the proposed use is not located within an area that would be in conflict with these functions.

Section 18.6 Operations

Operations in connection with the unclassified use permits shall not be more objectionable to nearby properties by reason of noise, fumes, vibrations, or flashing lights, than would be the operation of any permitted use.

STAFF: Based on the application materials submitted, the operation of a solar power plant would not be more objectionable to nearby properties or current allowed uses which include Suburban Residential (housing and common accessory buildings, sheds, shops, garages), Worship Facilities (Churches), Education Facilities (Small Private School), Agricultural (horses, grazing land), Commercial (communication tower, private event center), Industrial (railroad, storage of rail cars on existing tracks) and Utility (electrical substation, overhead electrical power lines, residential solar structures, residential wind structures) type uses which are visible throughout the area. The operation does not produce audible sounds from the property boundaries, does not produce any fumes or offensive odors during the process, there are no vibrations associated with the project and no flashing lights would be placed on the property or equipment as part of this project. Therefore, it can be determined that this project would

not be any more objectionable to nearby properties by reason of noise, fumes, vibrations, or flashing lights, than would be the operation of any permitted use.

RECOMMENDATION:

The following alternative motions are provided for the board's consideration.

- A. Alternative 1: Move the Unclassified Use Permit to allow a solar power plant business of producing and selling electricity on the properties be **denied** due to (ZBOA member proposing denial must delineate legal reason that the application be denied): or,
- B. Alternative 2: Move the Board adopt the staff report and **approve** the Unclassified Use Permit to allow a Solar Power Plant on the properties, subject to the following conditions:
 - 1. Comply with applicable requirements in Section 8.9 "Power Plants" and Section 8.12 "Solar Power Plants" and Section 18 "Unclassified Use Permits" of the Cascade County Zoning Regulations.
 - 2. Final approval from the Montana Public Service Commission to generate and sell power.
 - 3. All Storm Water generated will remain on the property being developed. All required permits must be obtained prior to construction.
 - 4. Mitigate or alleviate any requirements by the F.A.A.
 - 5. Provide routine maintenance of landscaping and buffer areas including proper weed control to prevent soil erosion, and properly maintain appearance.
 - 6. Obtain an approach permit from the Cascade County Public Works Department.
 - 7. The applicant obtains all required county, state, or federal permits and comply with regulations associated with any other permits.
 - 8. Obtain an address for the site as required by Cascade County Public Works Department.

Attachments:

- Unclassified Use Permit Application
 - Tab 1. Cascade County UUP Application completed by Fox Solar
 - Tab 2. Fox Solar Site Plan
 - Tab 3. Stormwater Erosion and Sediment Control Plan
 - Tab 4. Technical Memorandum
 - Tab 5. Fox Solar Impact Study by Kirkland Appraisals, LLC dated June 28, 2016
 - Tab 6. Moore Appraisals Inc. Letter regarding Fox Solar and Portage Solar Sites Impact on Surrounding Property Values dated June 23, 2016
 - Tab 7. Real Property Consultants review of Kirkland Appraisals, LLCs Impact Study dated February 9, 2016 (with referenced study attached)
 - Tab 8. Determination of No Hazard to Air Navigation dated May 5, 2016
 - Tab 9. Decommissioning Memorandum (Engineer's Opinion of Costs)
 - Tab 10. Photos of Proposed Site
 - Tab 11. Green Meadow Solar Project 10 Year Tax Estimate
 - Tab 12. Custom Soil Resource Report for Cascade County Area, Montana
 - Tab 13. Soil Map for Cascade County Area, Montana
 - Tab 14. Tax Revenues Summary Provided by Montana Department of Environmental Quality
 - Tab 15. Letter from Tim Moore, MAI 10-25-2016
 - Tab 16. Fox Solar Landscape Plan
 - Tab 17. Fox Solar Landscape Renderings (Callouts, Camera Point 5)
Letter Regarding Additional Materials submitted on 10-28-2016

Additional Reference Material links provided by the applicant

- Electric Power Research Institute and California Energy Commission. (2003). *Potential health and environmental impacts associated with the manufacture and use of photovoltaic cells*. Sacramento, CA: <http://www.energy.ca.gov/reports/500-04-053.PDF>
- Massachusetts Clean Energy Center. (2012). *Study of acoustic and EMF levels from solar photovoltaic projects*. Boston, MA: <http://files.masscec.com/research/StudyAcousticEMFLevelsSolarPhotovoltaicProjects.pdf>
- Riley, E. & Olson, S. (2011). *A study of hazardous glare potential to aviators from utility-scale flat-plate photovoltaic systems*. ISRN Renewable Energy, 2011: <http://www.hindawi.com/journals/isrn/2011/651857/>
- National Renewable Energy Laboratory. (2013). *Overview of opportunities for co-location of solar energy technologies and vegetation* (Report No. DE-AC36-08GO28308). Golden, CO: <http://www.nrel.gov/docs/fy14osti/60240.pdf>
- Turney, D. & Fthenakis, V. (2011). *Environmental impacts from the installation and operation of large-scale power plants*. Renewable and Sustainable Energy Review, 15, 3261-3270: https://www.bnl.gov/pv/files/pdf/229_RSER_WildLife_2011.pdf
- National Rural Electric Cooperative Association. (2015). *Cooperative utility PV manual*:
Volume I: <http://www.nreca.coop/wp-content/uploads/2015/02/NRECA-Cooperative-Utility-Field-Manual-Volume-I-Final.pdf>

Volume II: <http://www.nreca.coop/wp-content/uploads/2015/02/NRECA-Cooperative-Utility-PV-Field-Manual-Vol-II-Final.pdf>

Volume III: <http://www.nreca.coop/wp-content/uploads/2015/02/NRECA-Cooperative-Utility-PV-Field-Manual-Volume-III-Final.pdf>. This version has been updated as of February 2016.
- Jeff Court. (2014). *Photovoltaic solar safety management for utilities*. Incident Prevention Magazine, November 2014, available at <http://incident-prevention.com/ip-articles/safety-management/photovoltaic-solar-safety-management-for-utilities>
- National Fire Prevention Agency. (2015). *National electric code* (pp. 690.1-91, 370.1-120, 376.1-120, 408.1-58, 450.1-48, 480, 490.1-74, 705.1-135, 728, 750). Quincy, MA: National Fire Prevention Agency: <http://www.nfpa.org/codes-and-standards/all-codes-and-standards/list-of-codes-and-standards?mode=code&code=70&tab=about>. We have provided the online 2014 version, in case you are unable to access this code.