

Shadow Flicker Report

Arkwright Summit Wind Farm

Towns of Arkwright and Pomfret, Chautauqua County, New York

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1.0 PROJECT OVERVIEW

Arkwright Summit Wind Farm, LLC (the Project Sponsor), a wholly owned subsidiary of EDP Renewables (or EDPR), is proposing to construct a wind energy generation facility (and associated necessary Project infrastructure) in the Towns of Arkwright and Pomfret in Chautauqua County, New York (see Figure 1). The Project Sponsor is proposing to develop a wind-powered generating facility consisting of up to 36 turbines, which includes, 2 turbines with a nameplate capacity of 2.0 megawatts (MW) and 34 turbines with a nameplate capacity of 2.2 megawatts (MW), for a total anticipated nameplate generating capacity of 78.8 MW. However, to allow for flexibility on final site selection, the Project Sponsor is evaluating and seeks approval for 38 turbine sites. The purpose of this report is to provide an assessment of the predicted shadow flicker that could be experienced at residences (or residential receptors) located in the vicinity of the Project.

The wind turbine generators that will ultimately be constructed for the Project have not been determined. However, the largest wind turbines presently being considered for the Project are the Vestas V-110 wind turbines. For the purpose of presenting a conservative analysis, this assessment assumes the Project will use Vestas V-110 wind turbines. Each wind turbine consists of three major mechanical components: the tower, nacelle, and rotor. Assuming use of the Vestas V-110 turbines, the anticipated tower height for the Project, or “hub height” (height from foundation to top of tower), is approximately 95 meters (312 feet). The V-110 has a rotor diameter of 110 meters (361 feet), resulting in a total height of 150 meters (492 feet).

In addition to the turbines, the Project will include construction and operation of one permanent meteorological tower, a system of gravel access roads, electrical collection and communication cable networks, a generator lead line, an operations and maintenance (O&M) facility, and a substation and associated point of interconnection (POI) switchyard. In addition to the permanent components of the Project, the Project will require a temporary laydown yard and construction work space, including, but not limited to, areas to store Project components (laydown yards), construction vehicle parking areas, and cleared areas for turbine assembly. The current Project layout is depicted in Figure 2.

The Project is located in northwestern corner of Chautauqua County, New York (Figure 1) approximately 5.2 miles southeast of Lake Erie, 4.8 miles southeast of the City of Dunkirk, 3.7 miles south-southeast of the Village of Fredonia, 3.4 miles southwest of the Village of Forestville, and 4.6 miles northeast of the Village of Cassadaga. Located within the Towns of Arkwright and Pomfret, the Project will occur on approximately 6,000 acres of leased land (the Project Site) located off of State Route 83, Center Road, Ball Road, Straight Road, Brainard Road, and Webster Road (Figure 2).

The Project Site is primarily situated at the western end of the Allegheny Plateau, north of the Canadaway Creek Wildlife Management Area. This area is characterized by topography with elevations ranging from approximately 1,700 feet above mean sea level to 2,100 feet above mean sea level. The land cover within the Project Area consists mainly of deciduous and mixed forests and agricultural pastures, with predominantly rural residential, agricultural, and recreational land use.

2.0 INTRODUCTION

Shadow flicker refers to the moving shadows that an operating wind turbine casts over an identified receptor at times of the day when the turbine rotor is between the sun and a receptor's position. Shadow flicker is most pronounced in northern latitudes during winter months because of the lower angle of the sun in the winter sky. However, it is possible to encounter shadow flicker anywhere for brief periods before sunset and after sunrise (U.S. Department of the Interior, 2005). During intervals of sunshine, wind turbine generators will cast a shadow on surrounding areas as the rotor blades pass in front of the sun, causing a flickering effect while the rotor is in motion. Shadow flicker does not occur when fog or clouds obscure the sun, or when turbines are not operating.

The distance between a wind turbine and a potential shadow-flicker receptor affects the intensity of the shadows cast by the blades, and therefore the intensity of flickering. Shadows cast close to a turbine will be more intense, distinct, and focused. This is because a greater proportion of the sun's disc is intermittently blocked by the turbine (BERR, 2009). Obstacles such as terrain, vegetation, and/or buildings occurring between receptors and wind turbines may significantly reduce or eliminate shadow-flicker effects. At distances beyond roughly 10 rotor diameters, approximately 1,100 meters based on the Vestas V110 turbine model used in this case, shadow-flicker effects are generally considered negligible (BERR, 2009; DECC, 2011).

Although shadow flicker has been alleged to cause or contribute to health effects, blade pass frequencies for modern commercial scale wind turbines are very low. According to the Epilepsy Society (2012), approximately five percent of individuals with epilepsy have sensitivity to light. Most people with photosensitive epilepsy are sensitive to flickering around 16-25 Hz (Hertz or Hz = 1 flash per second), although some people may be sensitive to rates as low as 3 Hz and as high as 60 Hz. Modern wind turbines (including the proposed Vestas V110) operate at a frequency of 1 Hz or less, and there is no evidence that wind turbines can trigger seizures. The primary concern with shadow flicker is the annoyance it can cause for adjacent homeowners. Annoyance can trigger physiological reactions of the autonomic nervous and/or endocrine systems that increase the risk of cardiovascular disorders. However, it is important to note that annoyance is not a disease or physical illness in of itself; rather it is a variable and subjective response to stimuli that can include many other things besides shadow flicker seizures (British Epilepsy Association, 2007; Ellenbogen et al., 2012; Parsons Brinckerhoff, 2011; NHMRC, 2010).

The location and duration of shadow flicker can be predicted using computer modeling programs and input data regarding turbine characteristics and weather conditions. A “worst-case” shadow-flicker scenario could be predicted based on the assumptions that there are no clouds or fog, wind conditions allow continuous turbine operation, the turbine rotor is continuously perpendicular to the sun, and the turbine rotor is positioned between the receptor and the sun. However, this “worst-case” scenario is not what would actually occur because turbines do not operate continuously, are not always aligned perpendicular to the sun, and are not always positioned between the receptor and the sun. In addition, sunlight intensity and duration vary daily and seasonally, and obstacles that block shadows (terrain, vegetation, and buildings) exist in the landscape.

The shadow-flicker analysis conducted for the proposed Project was based on the conservative assumption that turbines are in continuous operation during daylight hours, and that shadow flicker can be perceived at a receptor structure regardless of the presence or orientation of windows. The effects of surrounding buildings, forest vegetation, and yard/street trees are also not taken into account in the shadow flicker model. Altering these assumptions and considering these factors can result in the actual shadow flicker effect being substantially reduced, and in some instances completely eliminated. Local sunshine and wind direction frequency data are used to more accurately predict rotor alignment and the percent of daylight hours when shadows are likely to be cast (see Attachment A).

3.0 METHODS

Shadow Flicker Model

This shadow flicker analysis evaluated the potential impact of 38 Vestas V110 turbines, each with a rotor diameter of 110 meters and a hub height of 95 meters. Prior to conducting the shadow-flicker analysis, the Project Sponsor identified potential receptors in the vicinity of the Project. A study area of roughly 10 rotor diameters is typical for analysis of shadow-flicker effects. In the case of the Vestas V110 turbine used in this analysis, 10 rotor diameters equals 1,100 meters (3,675 feet). A maximum distance of potential effect of 1,100 meters was used for this analysis to ensure that all potentially impacted structures were assessed.

The shadow flicker analysis for the proposed Project used *WindPRO 2.8.579* software and associated Shadow module. *WindPRO* is a widely accepted modeling software package developed specifically for the design and evaluation of wind power projects. Input variables and assumptions used for shadow flicker modeling calculations for the proposed Project include:

- Latitude and longitude coordinates of 38 proposed wind turbine sites (provided by the Project Sponsor).

- Latitude and longitude coordinates for 206 potential receptors located in the vicinity of the Project (provided by the Project Sponsor).
- USGS 1:24,000 topographic mapping and USGS 10-meter resolution digital elevation model (DEM) data.
- The rotor diameter (110 meters) and hub height (95 meters) for the Vestas V110 turbine.
- Annual wind rose data (provided by the Project Sponsor), which is depicted in Table A1 of Attachment A (to determine the approximate directional frequency of rotor orientation throughout the year).
- To account for the occurrence of cloudy conditions, the average monthly percent of available sunshine for the nearest NOAA weather station in Buffalo, New York was used. Data was obtained from NOAA's "Comparative Climatic Data for the United States through 2012" (see Table A2 of Attachment A) (<http://www.ncdc.noaa.gov>).
- No allowance was made for wind being below or above generation speeds. Blades are assumed to be moving during all daylight hours when the sun's elevation is more than 3 degrees above the horizon. Shadow flicker is generally considered imperceptible when the sun is less than 3 degrees above the horizon (due to the scattering effect of the atmosphere on low angle sunlight) (States Committee for Pollution Control, 2002).
- The possible screening effect of trees and buildings adjacent to the receptors was not taken into consideration in the modeling. In addition, the number and/or orientation of windows in residential structures were not taken into consideration in the analysis. However, consideration of potential Project visibility (per the Project's viewshed analysis) is included in the discussion of potential shadow-flicker impacts (see Section 5.0).

Shadow-flicker effects on receptors are expressed in terms of predicted frequency (hours per year). Shadow isolines (i.e., contours indicating total number of hours of shadowing per average year) were calculated based on the data and assumptions outlined above. These isolines define the theoretical number of hours per year that shadow flicker would occur at any given location within a 1,100-meter radius of all proposed turbines (see Figure 3).

The model calculations include the cumulative sum of shadow hours for all Project turbines. This omni-directional approach reports total shadow flicker results at a receptor regardless of the presence or orientation of windows at that particular residence (i.e., it assumes shadows from all directions can be perceived at a residence, which may or may not be true). A receptor in this "greenhouse" model is defined as a one square meter area located one meter above ground; actual house dimensions are not taken into consideration. Therefore, the analysis presented herein is expected to be a conservative projection of the shadow-flicker effects at ground level.

Viewshed Analysis

In addition to the WindPro computer model, vegetation viewshed maps were created using ArcGIS modeling to define areas of potential Project visibility. They identify areas within the study area that could have an unobstructed line of sight from the viewer to any portion of one or more of the proposed turbines. Vegetation viewshed maps for the Project

were prepared using 10-meter resolution USGS DEM data, the 2011 USGS National Land Cover Dataset (NLCD), the location and height of all proposed turbines, and ESRI ArcGIS® software with the Spatial Analyst extension. Based on standard visual assessment practice, the mapped locations of forest land within the study area was assigned an assumed height of 40 feet and added to the DEM. Once the viewshed analysis was completed, the areas covered by the forest vegetation layer were designated as “not visible” on the resulting data layer. In most forested areas, views will be well screened by the overhead tree canopy. During the growing season the forest canopy will fully block views of the proposed turbines, and such views will typically be almost completely obscured, or at least significantly screened by tree trunks and branches, even under “leaf-off” conditions. It is worth noting that areas of mapped forest vegetation do not include the locations of individual trees, street trees, yard vegetation, other miscellaneous trees and shrubs, or any other structures/objects in the landscape. Therefore, the viewshed analysis overestimates the potential visibility of the Project, and therefore represents a conservative analysis.

Field Review

A field review was conducted on June 10, 2015 to identify and document the potential screening elements that currently exist adjacent to receptors. The presence of existing screening was specifically evaluated at all receptor modeled to receive over 30 hours of shadow flicker per year, and documented with field notes and photographs. Photographs obtained during the June 10, 2015 field review are included in Figure 4.

4.0 RESULTS

Output from the WindPro model includes the following information:

- Calculated shadow-flicker time (days per year, maximum hours per day, and total hours per year when shadow flicker is expected) at each of the 206 receptors located in the vicinity of the Project.
- Tabulated and plotted time of day that structures are predicted to receive shadow flicker.
- Shadow isolines, which are used to create maps showing turbine locations, receptors, and projected shadow-flicker duration (hours per year) without taking into consideration the effect of screening provided by vegetation and structures (see Figure 3).

These data are presented in the tables and calendars included in Attachment C.

A summary of the projected shadow flicker at each of the 206 receptors is presented below:

- 32 (15.5%) of the receptors are not expected to experience any shadow flicker,
- Two (1.0%) of the receptors may be affected 0-1 hour/year,

- 92 (44.7%) of the receptors may be affected 1-10 hours/year,
- 43 (20.9%) of the receptors may be affected 10-20 hours/year,
- 23 (11.2%) of the receptors may be affected 20-30 hours/year,
- 14 (6.8%) of the receptors may be affected for more than 30 hours/year.

As these results indicate, 61.2% of the receptors are predicted to receive 10 hours of shadow flicker or less per year. Of these, 32 (or approximately 15.5% of all receptors) are predicted to receive no shadow flicker. At most receptor locations that experience shadow flicker, the effect will occur primarily in the early morning or late afternoon and will generally last less than 1 hour per day. The maximum daily duration of shadow flicker predicted at any receptor is 1 hour and 29 minutes (at receptor 387).

Attachment B provides a summary of the predicted shadow flicker at each structure calculated to experience more than 10 hours of shadow flicker per year. The times of day and duration of shadow flicker experienced by each structure will vary throughout the calendar year based on the position of the sun in the sky and the direction of prevailing winds. See Attachment C for a table indicating the amount of shadow flicker expected at each receptor and for detailed calendars that illustrate the specific times of year and day that shadow flicker may occur.

5.0 DISCUSSION

No consistent national, state, county, or local standards exist for allowable frequency or duration of shadow flicker from wind turbines at the proposed Project site. In general, quantified limits on shadow flicker are uncommon in the United States because studies have not shown it to be a significant issue (USDOE, 2008, 2012; NRC, 2007). However, standards developed by some states and countries provide guidance in this regard. The New Hampshire Office of Energy and Planning (2008) issued a model ordinance for small wind energy systems (<100kW) that defines significant shadow flicker impacts as more than 30 hours per year on abutting occupied buildings. A model wind ordinance prepared by the North Carolina Wind Working Group in 2008 suggests a limit of 30 hours per year (generally less than 1% of annual daylight hours) at any occupied building on a non-participating landowner's property (NCWWG, 2008). The Wisconsin Administrative Code (WAC) specifies a limit of 30 hours per year at any non-participating residence or occupied community building (Wisconsin Public Service Commission, 2012). The WAC also requires mitigation for non-participating residences or occupied community buildings experiencing 20 hours or more per year of shadow flicker. The Ohio Power Siting Board uses 30 annual hours of shadow flicker as a threshold of acceptability in reviewing commercial wind power projects (OPSB, 2011a, 2011b, 2012). Additionally, international guidelines from Europe and Australia have suggested 30 hours of shadow flicker per year as the threshold of significant impact, or the point at which shadow flicker is commonly perceived as an annoyance (NRC, 2007; DECC, 2011; DPCD, 2012). Accordingly,

a threshold of 30 shadow flicker hours per year was applied to the analysis of the proposed Project to identify any potentially significant impacts on area residences.

The results of this analysis indicate that 14 receptors are predicted to exceed the 30-hour threshold. However, seven of these receptors are Project participants. Of the remaining seven, the Project Sponsor is currently pursuing setback/neighbor agreements with each of them. The details regarding anticipated shadow flicker at these structures are summarized below in Table 1.

Table 1. Structures Exceeding 30 Hours of Shadow Flicker per Year.

Receptor ID	Project Status	Predicted Shadow Flicker (hh:mm/year)	Predicted Shadow Flicker (days/year)	Predicted Shadow Flicker (hh:mm/day)	Turbines Contributing Shadow Flicker	Approximate Times of Day Receptor Potentially Affected by Flicker ¹
44	Non-participant	38:20:00	171	0:55	21, 66, 114	6:00AM - 8:30AM
						6:45PM - 8:15PM
103	Participant	53:04:00	258	0:58	19, 21, 66	7:00AM – 9:45AM
						3:00PM – 4:30PM
104	Non-participant	39:56:00	193	0:52	19, 21, 66	6:45AM - 9:00AM
						3:45PM – 5:45PM
113	Non-participant	41:06:00	224	0:52	29, 30, 33, 115	6:30AM – 9:30AM
						7:30PM – 8:30PM
114	Participant	48:09:00	236	1:19	29, 30, 33, 100, 115	6:00AM – 10:15AM
						7:15PM – 8:15PM
125	Non-participant	35:39:00	112	1:02	36, 51	6:00AM – 7:00AM
						7:15PM - 8:15PM
126	Non-participant	30:08:00	118	0:51	36, 51	6:00AM – 7:00AM
						7:15PM - 8:15PM
135	Participant	37:38:00	87	1:19	36, 51, 111	6:00AM – 7:00AM
						7:30PM – 8:30PM
136	Participant	35:26:00	133	1:08	36, 51, 101, 111	6:00AM – 7:00AM
						5:30AM – 7:00PM
						7:30PM – 8:45PM
153	Participant	30:55:00	149	1:21	41, 43, 112, 115	6:15AM – 79:15AM
231	Non-participant	36:16:00	266	0:43	41, 43, 101, 112	6:30AM – 9:15AM
232	Non-participant	32:59:00	197	0:38	41, 43, 10	6:15AM - 9:15AM
233	Participant	52:14:00	257	1:03	11, 15, 16, 114	7:45AM - 9:15AM
						5:30PM - 6:45PM

Receptor ID	Project Status	Predicted Shadow Flicker (hh:mm/year)	Predicted Shadow Flicker (days/year)	Predicted Shadow Flicker (hh:mm/day)	Turbines Contributing Shadow Flicker	Approximate Times of Day Receptor Potentially Affected by Flicker ¹
						7:00PM - 8:30PM
387	Participant	49:01:00	251	1:29	28, 29, 30, 100, 115	6:15AM – 8:15AM
						8:30AM - 10:45AM
						7:00PM – 7:45PM

¹The times of day presented in Table 1 represent the range of times during which each structure could potentially experience shadow flicker throughout the year; however, no structures will experience shadow flicker every day during all those hours. See Attachment B for detailed calendars that illustrate the specific times of year and day that each structure may experience shadow flicker.

Although shadow flicker at these receptors exceeds the 30-hour per year threshold, these calculations do not take into account the actual location and orientation of windows, or the screening effects associated with existing, site-specific conditions and obstacles such as vegetation and/or buildings. Further, this analysis assumes turbine rotors are continuously in motion during daylight hours. Given these assumptions, the predicted shadow-flicker frequency represents a conservative scenario, and almost certainly overstates the actual frequency of shadow flicker that would be experienced at any given receptor location. In addition, many of the modeled shadow flicker hours are expected to be low intensity because they would occur during the early morning or late afternoon hours when the sun is low in the sky. As the sun sinks below the horizon, more of its light is scattered by the atmosphere, which has the effect of dampening its brightness and therefore reducing its ability to cast dark shadows (EMD, 2013).

To provide a more realistic prediction of where shadow flicker will actually be perceived, model results were compared to the results of the viewshed analysis conducted for the Project as well as the results of field review. As described in Section 3.0, the vegetation viewshed analysis takes into consideration the screening effect of mapped forest vegetation with an assumed average height of 40 feet (EDR, 2015). The viewshed analysis indicates that 8 of the 14 receptors predicted to experience over 30 hours of shadow flicker will not have views of the Project (see Table 2 and Figure 4). Additionally, field verification determined that of the 6 remaining receptors not excluded by the viewshed analysis, six would most likely have no or limited visibility of the Project (see Table 2 and Figure 4). Therefore, these receptors would experience either no shadow flicker, or in the instances where receptors have partial or limited visibility of the Project, the shadow flicker received by that receptor would be far less than predicted by the model.

Table 2. Visibility of Structures Exceeding 30 Hours of Shadow Flicker per Year.

Receptor ID	Project Status	Residential Type	Vegetation Viewshed Analysis	Field Reconnaissance	Figure
44	Non-Participant	Occupied	Project Visible	Minimal Visibility - Screening on North, East, and West Sides	Figure 4 - Sheet 6
103	Participant	Appears Unoccupied	Project Visible	Minimal Visibility - Screening on East Side	Figure 4 - Sheet 5
104	Non-Participant	Occupied	Project Visible	Minimal Visibility - Screening on North and East Sides	Figure 4 - Sheet 5
113	Non-Participant	Occupied	Project Not Visible	Minimal Visibility - Screening on West Side	Figure 4 – Sheet 3
114	Participant	Occupied	Project Partially Visible	Project Not Visible	Figure 4 - Sheet 3
125	Non-Participant	Occupied	Project Not Visible	Project Not Visible	Figure 4 - Sheet 2
126	Non-Participant	Occupied	Project Not Visible	Project Not Visible	Figure 4 – Sheet 2
135	Participant	Occupied	Project Not Visible	Project Not Visible	Figure 4 - Sheet 2
136	Participant	Occupied	Project Not Visible	Project Not Visible	Figure 4 - Sheet 2
153	Participant	Appears Seasonal	Project Not Visible	Minimal Visibility – Screening on North and West Sides	Figure 4 – Sheet 4
231	Non-Participant	Appears Seasonal	Project Not Visible	Project Not Visible	Figure 4 - Sheet 1
232	Non-Participant	Appears Seasonal	Project Not Visible	Project Not Visible	Figure 4 - Sheet 1
233	Participant	Seasonal (Summer Camp)	Project Partially Visible	Minimal Visibility - Screening on North and South Sides	Figure 4 - Sheet 7
387	Participant	Occupied	Project Partially Visible	Project Not Visible	Figure 4 - Sheet 3

As indicated in Table 2 above (and depicted in Figure 4), receptors 113, 125, 135, 136, 153, 231, 232, and 387 are not anticipated to receive any shadow flicker due to the extent of screening by intervening vegetation. For the remainder of the receptors (44, 103, 104, 114, 233, and 387) visibility of the Project is also anticipated to be completely or significantly screened by intervening vegetation. Therefore, it is anticipated that these receptors will receive no shadow-flicker, or are expected to experience minimal shadow flicker from visual screening provided by existing structures and nearby trees (Figure 4 – Sheets 4, 5, 6, and 8). There are no receptors within the study area predicted to receive greater than 30 hours of shadow flicker where existing vegetation will not completely or significantly screen views of the Project. Consequently, for the most part the Project avoids significant impacts from shadow flicker on residential receptors.

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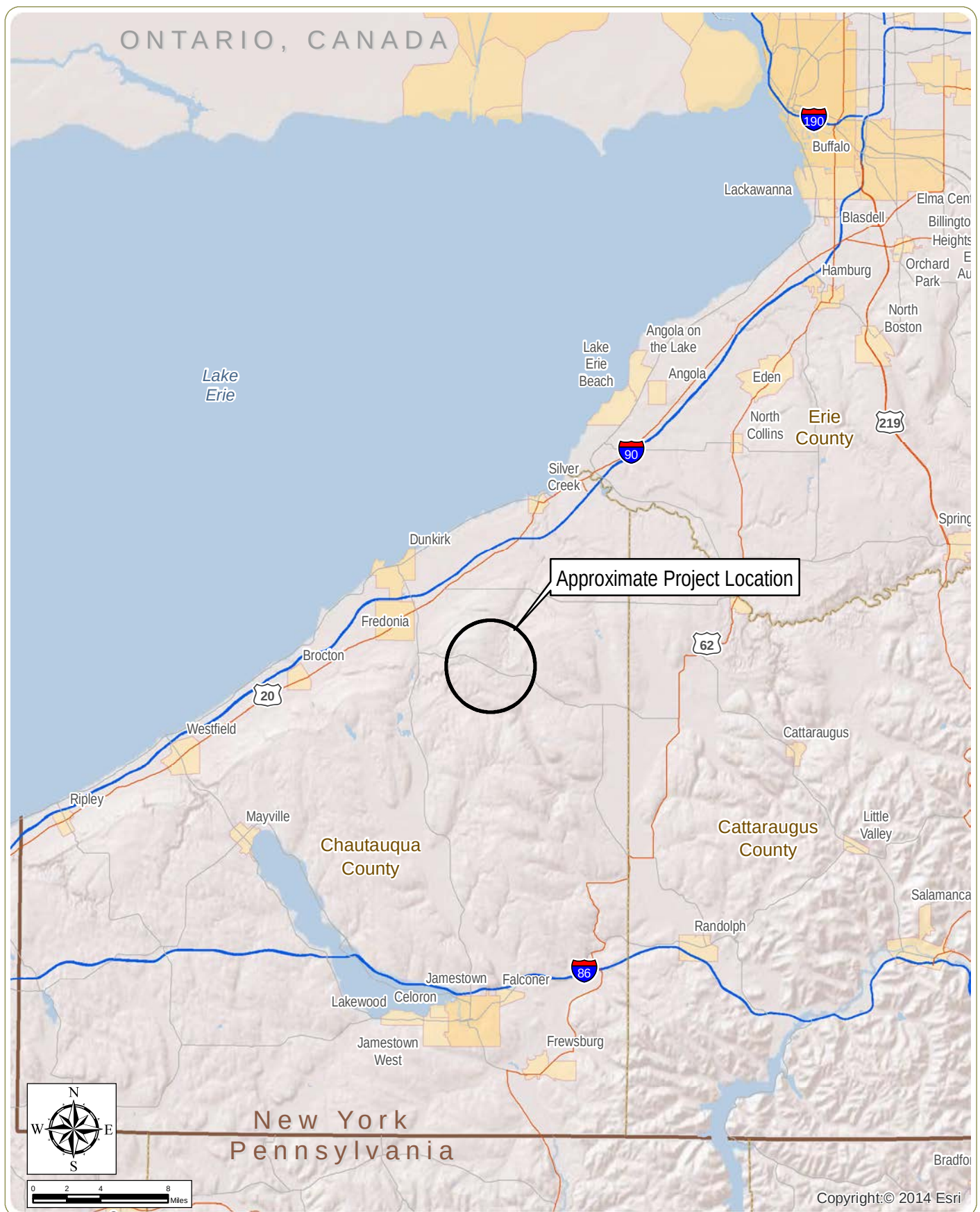
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Figures



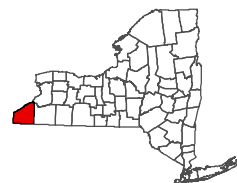
Arkwright Summit Wind Farm

Towns of Arkwright and Pomfret - Chautauqua County, New York

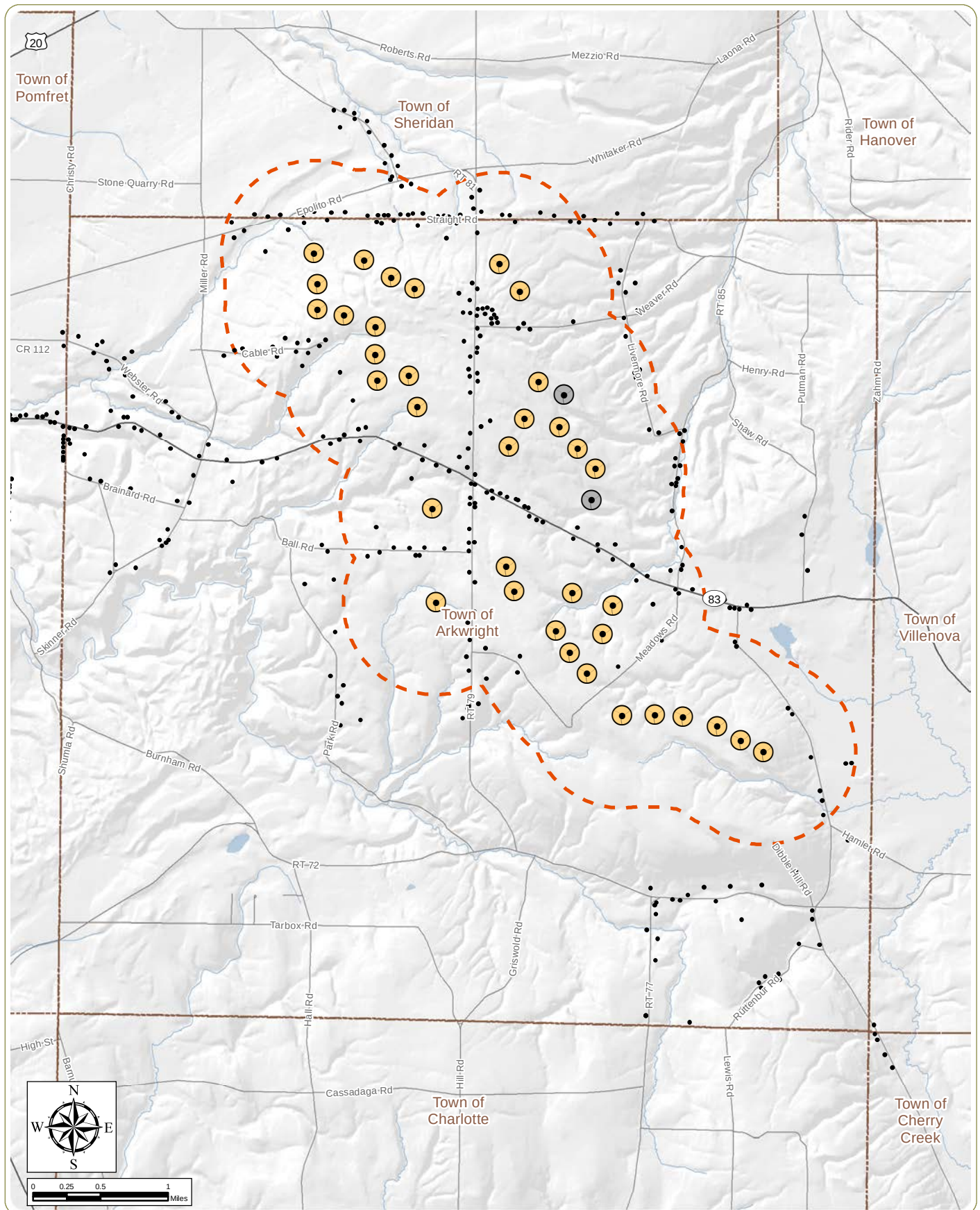
Figure 1: Regional Project Location

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Notes: 1. Basemap: ESRI ArcGIS Online "World Shaded Relief" Map Service and ESRI StreetMap North America, 2008.
2. This is a color graphic. Reproduction in grayscale may misrepresent the data.



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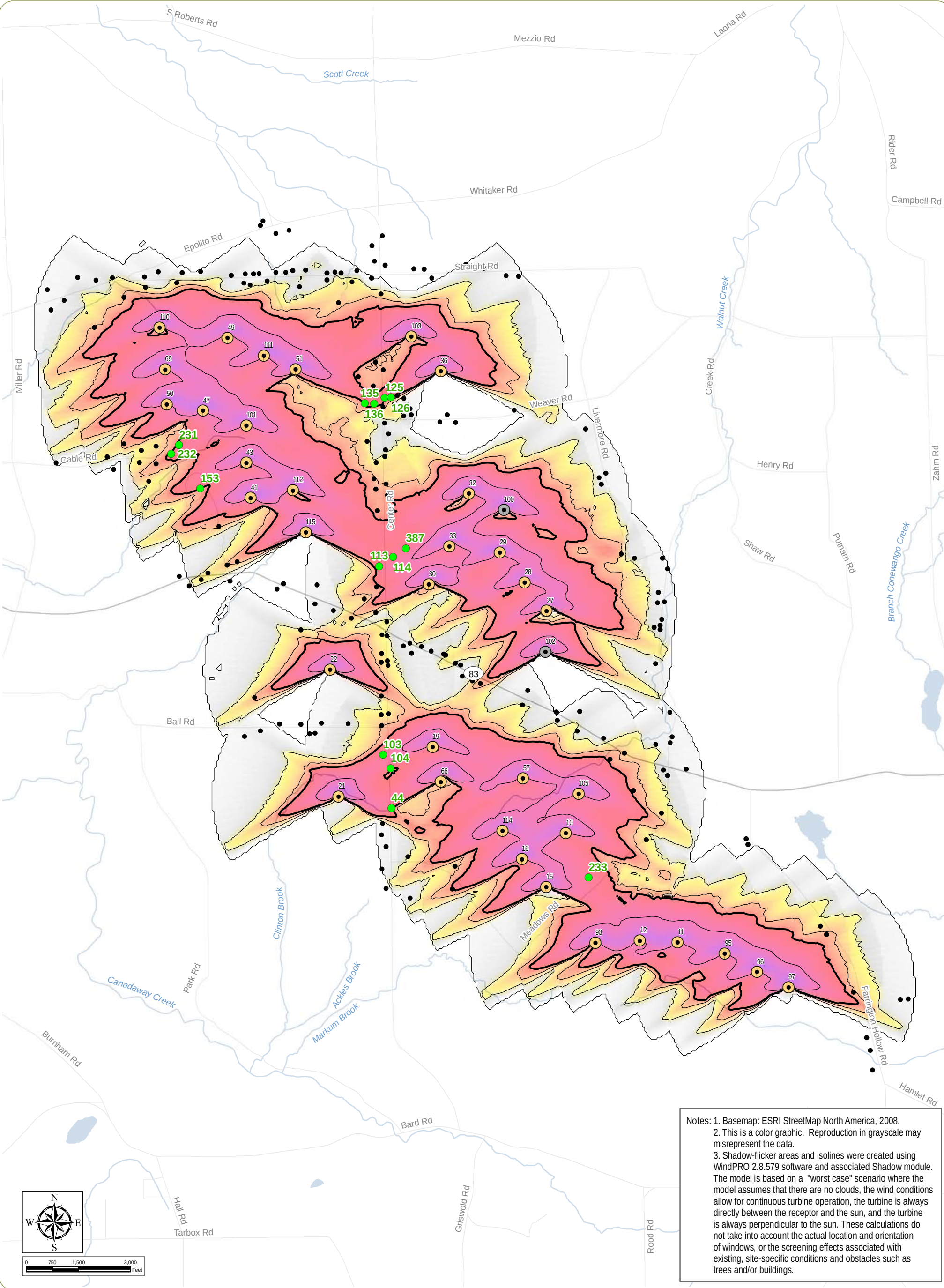
Towns of Arkwright and Pomfret - Chautauqua County, New York

Figure 2: Proposed Turbine Layout

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Notes: 1. Basemap: Hillshade generated from USGS digital elevation model data and ESRI StreetMap North America, 2008.
2. This is a color graphic. Reproduction in grayscale may misrepresent the data.

-  Proposed Wind Turbine
-  Alternate Wind Turbine
-  1100-meter Radius
-  Town Boundary



Notes: 1. Basemap: ESRI StreetMap North America, 2008.
2. This is a color graphic. Reproduction in grayscale may misrepresent the data.
3. Shadow-flicker areas and isolines were created using WindPRO 2.8.579 software and associated Shadow module. The model is based on a "worst case" scenario where the model assumes that there are no clouds, the wind conditions allow for continuous turbine operation, the turbine is always directly between the receptor and the sun, and the turbine is always perpendicular to the sun. These calculations do not take into account the actual location and orientation of windows, or the screening effects associated with existing, site-specific conditions and obstacles such as trees and/or buildings.

Arkwright Summit Wind Farm
Chautauqua County, New York

Figure 3: Projected Shadow Flicker

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- Receptor receiving < 30 hours/year
- Receptor receiving > 30 hours/year
- Proposed Wind Turbine
- Alternate Wind Turbine

Shadow Flicker Isolines (hours/year)

- 0
- 10
- 20
- 30
- 100

Shadow Flicker (hours/year)

- < 1
- 1 - 10
- 10 - 20
- 20 - 30
- 30 - 100
- > 100



Arkwright Summit
Wind Farm

Towns of Arkwright and
Pomfret - Chautauqua County,
New York

Figure 4: Receptors Receiving
Over 30 Hours of
Shadow Flicker - Index

September 2015

- Receptors > 30 Hours of Shadow Flicker
- Alternate Wind Turbine
- Wind Turbine
- Project Site

Notes:
1. Basemap:
2. This is a color graphic. Reproduction in
grayscale may misrepresent the data.



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Arkwright Summit Wind Farm

Towns of Arkwright and Pomfret - Chautauqua County, New York

Figure 4: Receptors Receiving Over 30 Hours of Shadow Flicker - Sheet 1

September 2015

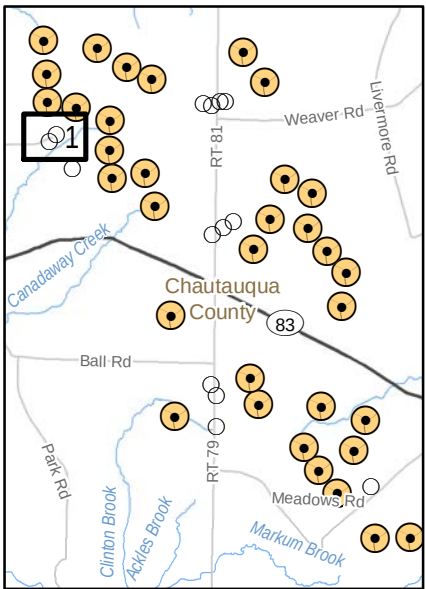
Vegetation Viewshed

- Project Screened
- Project Potentially Visible

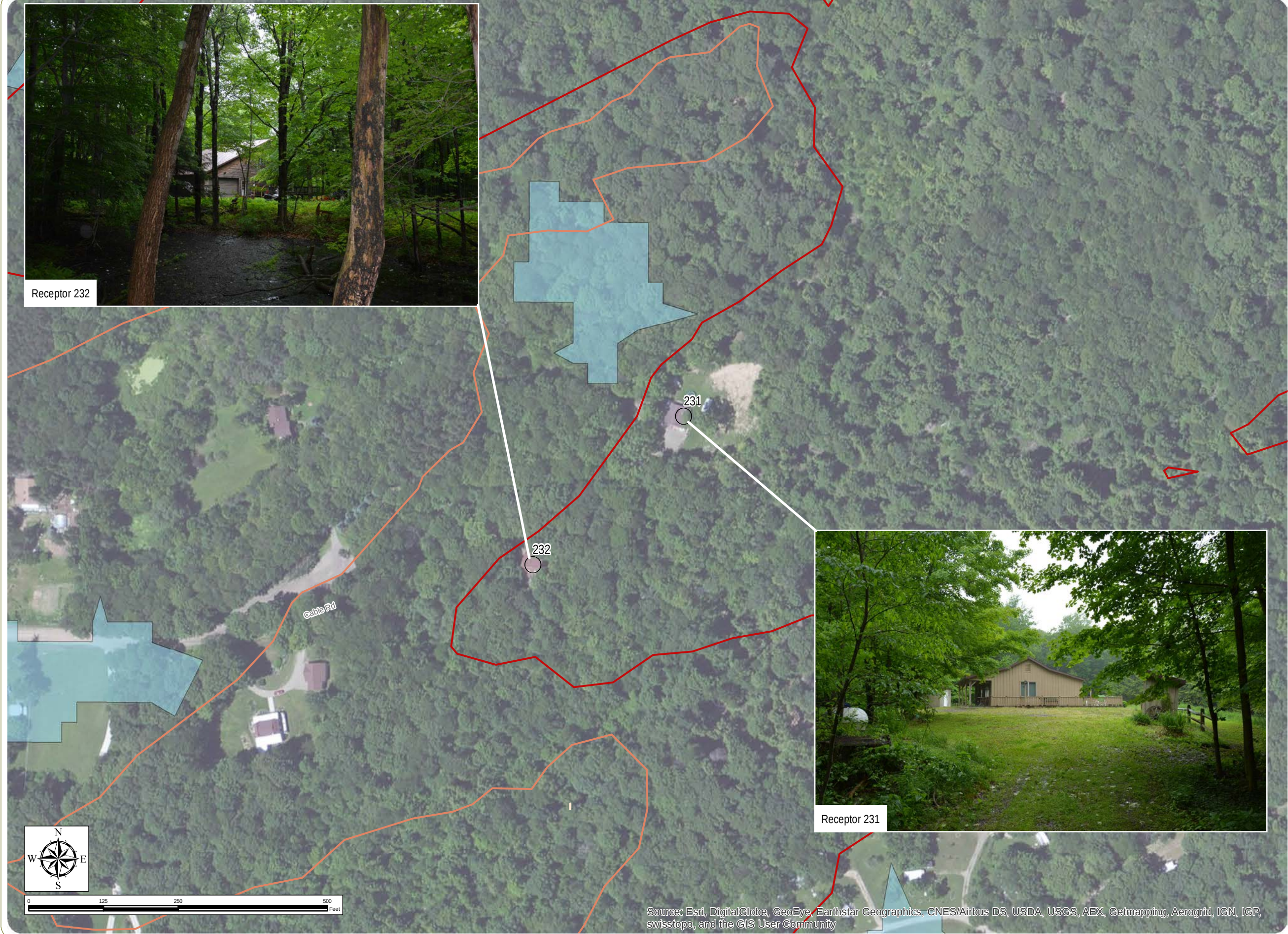
Shadow Flicker Contours

- > 10 Hours
- > 20 Hours
- > 30 Hours

- Receptors > 30 Hours of Shadow Flicker
- Wind Turbine
- Alternate Wind Turbine



Notes:
1. Basemap: ESRI ArcGIS "Imagery" map service.
2. This is a color graphic. Reproduction in grayscale may misrepresent the data.



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Arkwright Summit Wind Farm

Towns of Arkwright and Pomfret - Chautauqua County, New York

Figure 4: Receptors Receiving Over 30 Hours of Shadow Flicker - Sheet 2

October 2015

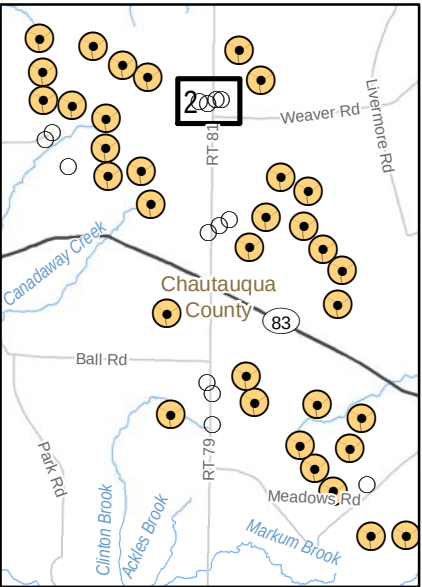
Vegetation Viewshed

- Project Screened
- Project Potentially Visible

Shadow Flicker Contours

- > 10 Hours
- > 20 Hours
- > 30 Hours

- Receptors > 30 Hours of Shadow Flicker
- Wind Turbine
- Alternate Wind Turbine



Notes:
1. Basemap: ESRI ArcGIS "Imagery" map service.
2. This is a color graphic. Reproduction in grayscale may misrepresent the data.



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Arkwright Summit
Wind Farm

Towns of Arkwright and
Pomfret - Chautauqua County,
New York

Figure 3: Receptors Receiving
Over 30 Hours of
Shadow Flicker - Sheet 3

September 2015

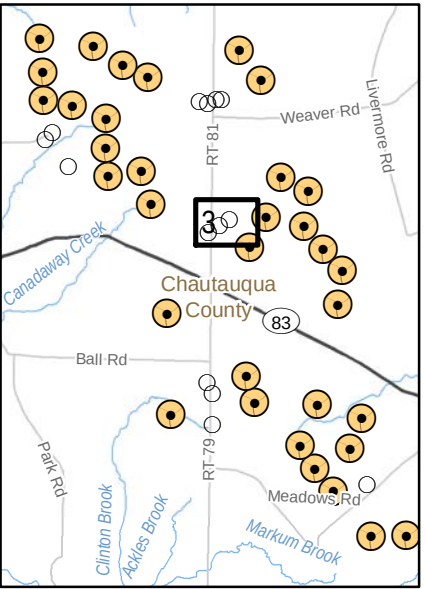
Vegetation Viewshed

- Project Screened
- Project Potentially Visible

Shadow Flicker Contours

- > 10 Hours
- > 20 Hours
- > 30 Hours

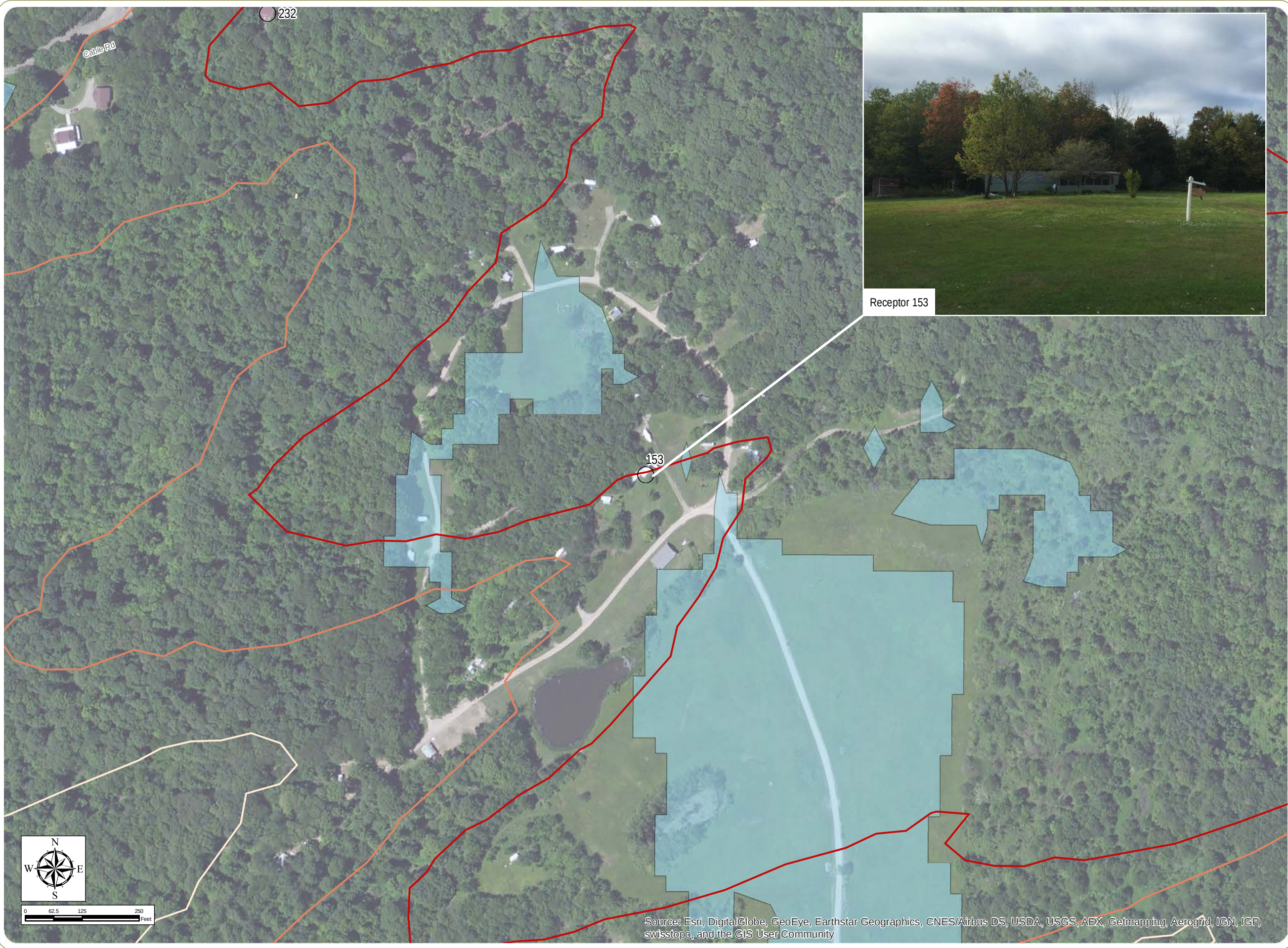
- Receptors > 30 Hours of Shadow Flicker
- Wind Turbine
- Alternate Wind Turbine



Notes:
1. Basemap: ESRI ArcGIS "Imagery" map service.
2. This is a color graphic. Reproduction in grayscale may misrepresent the data.



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



Receptor 153

Arkwright Summit Wind Farm

Towns of Arkwright and Pomfret - Chautauqua County, New York

Figure 4: Receptors Receiving Over 30 Hours of Shadow Flicker - Sheet 4

October 2015

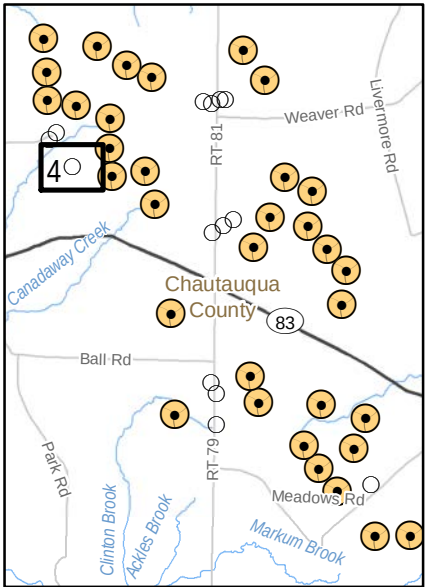
Vegetation Viewshed

- Project Screened
- Project Potentially Visible

Shadow Flicker Contours

- > 10 Hours
- > 20 Hours
- > 30 Hours

- Receptors > 30 Hours of Shadow Flicker
- Wind Turbine
- Alternate Wind Turbine



Notes:
1. Basemap: ESRI ArcGIS "Imagery" map service.
2. This is a color graphic. Reproduction in grayscale may misrepresent the data.



Arkwright Summit Wind Farm

Towns of Arkwright and Pomfret - Chautauqua County, New York

Figure 4: Receptors Receiving Over 30 Hours of Shadow Flicker - Sheet 5

September 2015

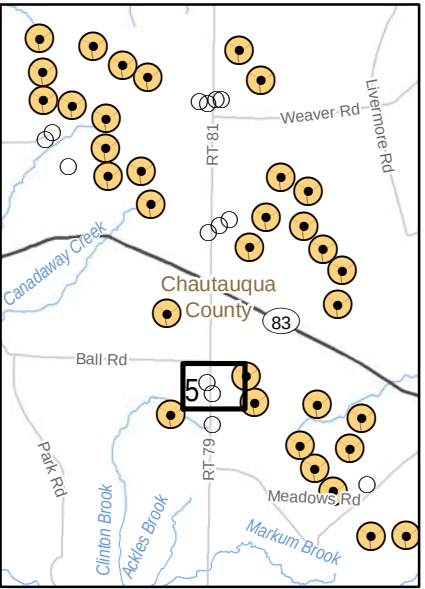
Vegetation Viewshed

- Project Screened
- Project Potentially Visible

Shadow Flicker Contours

- > 10 Hours
- > 20 Hours
- > 30 Hours

- Receptors > 30 Hours of Shadow Flicker
- Wind Turbine
- Alternate Wind Turbine



Notes:
1. Basemap: ESRI ArcGIS "Imagery" map service.
2. This is a color graphic. Reproduction in grayscale may misrepresent the data.



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Arkwright Summit Wind Farm

Towns of Arkwright and Pomfret - Chautauqua County, New York

Figure 4: Receptors Receiving Over 30 Hours of Shadow Flicker - Sheet 6

September 2015

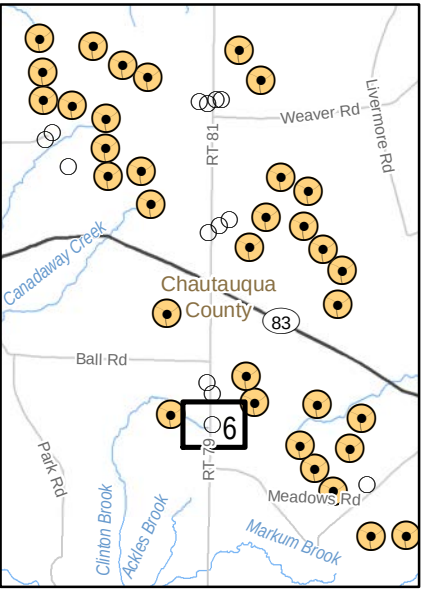
Vegetation Viewshed

- Project Screened
- Project Potentially Visible

Shadow Flicker Contours

- > 10 Hours
- > 20 Hours
- > 30 Hours

- Receptors > 30 Hours of Shadow Flicker
- Wind Turbine
- Alternate Wind Turbine



Notes:
1. Basemap: ESRI ArcGIS "Imagery" map service.
2. This is a color graphic. Reproduction in grayscale may misrepresent the data.



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Arkwright Summit Wind Farm

Towns of Arkwright and Pomfret - Chautauqua County, New York

Figure 4: Receptors Receiving Over 30 Hours of Shadow Flicker - Sheet 7

September 2015

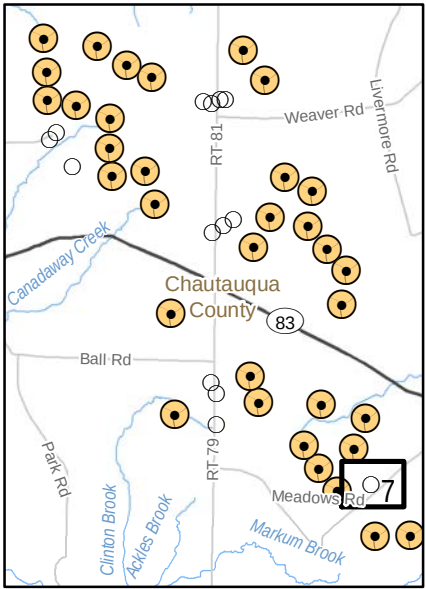
Vegetation Viewshed

- Project Screened
- Project Potentially Visible

Shadow Flicker Contours

- > 10 Hours
- > 20 Hours
- > 30 Hours

- Receptors > 30 Hours of Shadow Flicker
- Wind Turbine
- Alternate Wind Turbine



Notes:
1. Basemap: ESRI ArcGIS "Imagery" map service.
2. This is a color graphic. Reproduction in grayscale may misrepresent the data.



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Attachment A

Wind Rose and Sunshine Data

Table A1. Wind Rose Data

SECTOR	N	NNE	NE	ENE	E	ESE	SE	SSE
Frequency	3.03	3.25	3.07	3.03	2.76	2.86	3.73	4.85
Hours of Operation	265	284	269	265	242	250	327	425

SECTOR	S	SSW	SW	WSW	W	WNW	NW	NNW
Frequency	10.37	13.25	10.55	12.69	12.76	6.17	4.40	3.25
Hours of Operation	908	1,160	924	1,111	1,117	541	386	285

Source: Wind rose data provided by Arkwright Summit Wind, LLC.

Table A2. Sunshine Probability Data¹

Month	JAN	FEB	MAR	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
Sunshine Probability ²	0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

¹Source: NOAA Comparative Climatic Data for the United States through 2012 – Buffalo, NY Weather Station.

²Defined by NOAA as the total time that sunshine reaches the surface of the earth, expressed as the percentage of the maximum amount possible from sunrise to sunset with clear sky conditions.

Attachment B

Receptors Expected to Receive Over 10 Hours per Year

Arkwright Summit Wind Project			
Shadow Flicker Summary for Receptors Receiving Greater than 10hrs/year			
Receptor ID	Shadow days per year	Max Hrs/Day (hh:mm/day)	Predicted (hh:mm:ss/year)
81	68	0:45	10:15
69	108	0:30	10:32
134	82	0:27	10:35
391	107	0:29	10:47
2	77	1:01	10:48
83	90	0:41	11:09
145	63	0:30	11:40
82	79	0:48	11:41
119	117	0:46	11:43
41	107	1:00	11:58
388	69	0:38	12:01
149	112	0:28	12:07
224	88	0:36	12:08
366	73	0:28	12:38
142	76	1:06	12:40
184	108	0:57	12:43
43	78	1:24	13:02
72	83	0:35	13:06
94	119	0:49	13:07
237	63	0:49	13:07
95	108	0:54	13:13
50	129	0:33	13:26
121	125	0:58	13:26
90	66	0:49	13:50
148	119	0:27	13:52
150	114	0:30	14:02
392	84	0:29	14:28
225	102	0:35	14:45
92	68	0:53	14:49
140	76	1:27	15:30
152	136	0:32	15:34
221	137	0:37	15:50
91	72	0:55	16:48
227	137	0:48	17:28
235	109	0:43	17:33
84	80	0:36	18:09
110	113	0:43	18:21
384	146	0:56	18:44
93	128	0:44	19:05

212	86	0:36	19:38
183	85	1:16	19:45
96	145	0:52	19:52
117	184	0:55	19:55
39	130	1:05	20:32
37	170	0:44	20:53
213	109	0:38	21:19
382	95	0:38	21:31
112	83	0:42	21:50
182	73	1:26	22:22
55	79	1:10	22:36
116	153	0:59	22:55
197	168	0:47	23:00
115	186	0:53	23:25
71	136	0:40	23:47
138	71	1:28	24:23:00
124	126	0:54	24:51:00
147	147	0:36	25:10:00
128	117	0:49	25:38:00
118	214	0:58	25:53:00
151	169	0:32	25:56:00
236	184	0:44	25:59:00
389	133	0:52	26:40:00
226	129	1:11	27:50:00
111	128	0:41	27:59:00
139	125	1:10	28:40:00
190	162	1:02	28:58:00
126	118	0:51	30:08:00
153	149	1:21	30:55:00
232	197	0:38	32:59:00
136	133	1:08	35:26:00
125	112	1:02	35:39:00
231	266	0:43	36:16:00
135	87	1:19	37:38:00
44	171	0:55	38:20:00
104	193	0:52	39:56:00
113	224	0:52	41:06:00
114	236	1:19	48:09:00
387	251	1:29	49:01:00
233	257	1:03	52:14:00
103	258	0:58	53:04:00

Attachment C

WindPRO Overview Reports and Calendars

SHADOW - Main Result

Calculation: 2015-08-31 Arkwright Summit SFA Vestas V110

Assumptions for shadow calculations

Maximum distance for influence	1,100 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	1 minutes

Sunshine probability S/S_0 (Sun hours/Possible sun hours) □

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW
265	284	269	265	242	250	327	425	908	1,160	924	1,111

W	WNW	NW	NNW	Sum
1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

A ZVI (Zones of Visual Influence) calculation is performed before flicker calculation so non visible WTG do not contribute to calculated flicker values.

A WTG will be visible if it is visible from any part of the receiver window. The

ZVI calculation is based on the following assumptions:

Height contours used: Height Contours: 5m_contours.wpo (1)

Obstacles not used in calculation

Eye height: 1.5 m

Grid resolution: 10.0 m

WTGs

UTM (north)-NAD27 (US) Zone: 17

East	North	Z	Row data/Description
------	-------	---	----------------------

WTG type

[illegible]

To be continued on next page...

Project:

2015-08-31_Arkwright Summit_SFA

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EDR

217 Montgomery St.

US-SYRACUSE, NY 13202

(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Main Result**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110

...continued from previous page

UTM (north)-NAD27 (US) Zone: 17					WTG type						
	East	North	Z	Row data/Description	Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	RPM
			[m]					[kW]	[m]	[m]	[RPM]
100	646,164	4,697,312	470.0	VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (T...	Yes	VESTAS	V110-2.0-2,000	2,000	110.0	95.0	0.0
101	643,902	4,698,054	490.0	VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (T...	Yes	VESTAS	V110-2.0-2,000	2,000	110.0	95.0	0.0
102	646,529	4,696,066	461.3	VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (T...	Yes	VESTAS	V110-2.0-2,000	2,000	110.0	95.0	0.0
103	645,353	4,698,851	455.0	VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (T...	Yes	VESTAS	V110-2.0-2,000	2,000	110.0	95.0	0.0
105	646,821	4,694,819	490.5	VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (T...	Yes	VESTAS	V110-2.0-2,000	2,000	110.0	95.0	0.0
110	643,140	4,698,914	412.4	VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (T...	Yes	VESTAS	V110-2.0-2,000	2,000	110.0	95.0	0.0
111	644,068	4,698,647	479.0	VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (T...	Yes	VESTAS	V110-2.0-2,000	2,000	110.0	95.0	0.0
112	644,312	4,697,484	512.2	VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (T...	Yes	VESTAS	V110-2.0-2,000	2,000	110.0	95.0	0.0
114	646,152	4,694,496	542.5	VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (T...	Yes	VESTAS	V110-2.0-2,000	2,000	110.0	95.0	0.0
115	644,425	4,697,116	515.0	VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (T...	Yes	VESTAS	V110-2.0-2,000	2,000	110.0	95.0	0.0

Shadow receptor-Input

UTM (north)-NAD27 (US) Zone: 17									
No.	East	North	Z	Width	Height	Height a.g.l.	Degrees from south cw	Slope of window	Direction mode
			[m]	[m]	[m]	[m]	[°]	[°]	
1	645,131	4,694,353	538.4	1.0	1.0	1.0	0.0	90.0	"Green house mode"
2	644,383	4,696,258	490.1	1.0	1.0	1.0	0.0	90.0	"Green house mode"
3	643,760	4,696,684	494.9	1.0	1.0	1.0	0.0	90.0	"Green house mode"
7	646,295	4,699,361	405.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
9	646,187	4,699,368	405.3	1.0	1.0	1.0	0.0	90.0	"Green house mode"
10	645,993	4,699,433	416.2	1.0	1.0	1.0	0.0	90.0	"Green house mode"
11	645,832	4,699,463	420.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
12	645,533	4,699,345	427.6	1.0	1.0	1.0	0.0	90.0	"Green house mode"
13	645,465	4,699,425	430.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
14	645,376	4,699,426	425.4	1.0	1.0	1.0	0.0	90.0	"Green house mode"
15	645,124	4,699,458	425.6	1.0	1.0	1.0	0.0	90.0	"Green house mode"
16	644,612	4,699,330	435.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
17	644,373	4,699,269	433.8	1.0	1.0	1.0	0.0	90.0	"Green house mode"
18	644,087	4,699,320	420.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
19	643,883	4,699,301	417.5	1.0	1.0	1.0	0.0	90.0	"Green house mode"
20	643,938	4,699,284	419.9	1.0	1.0	1.0	0.0	90.0	"Green house mode"
21	643,504	4,699,404	407.1	1.0	1.0	1.0	0.0	90.0	"Green house mode"
22	643,896	4,699,382	415.1	1.0	1.0	1.0	0.0	90.0	"Green house mode"
23	644,016	4,699,384	416.3	1.0	1.0	1.0	0.0	90.0	"Green house mode"
24	643,967	4,699,383	416.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
25	644,163	4,699,397	415.3	1.0	1.0	1.0	0.0	90.0	"Green house mode"
26	644,252	4,699,396	421.2	1.0	1.0	1.0	0.0	90.0	"Green house mode"
27	644,312	4,699,410	422.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
28	644,426	4,699,416	425.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
29	644,611	4,699,390	431.5	1.0	1.0	1.0	0.0	90.0	"Green house mode"
30	644,683	4,699,399	429.7	1.0	1.0	1.0	0.0	90.0	"Green house mode"
31	644,874	4,699,412	427.2	1.0	1.0	1.0	0.0	90.0	"Green house mode"
32	645,030	4,699,493	423.8	1.0	1.0	1.0	0.0	90.0	"Green house mode"
33	642,190	4,699,067	350.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
34	642,159	4,699,242	349.1	1.0	1.0	1.0	0.0	90.0	"Green house mode"
35	642,423	4,699,350	355.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
36	642,306	4,699,152	350.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
37	642,569	4,698,911	377.1	1.0	1.0	1.0	0.0	90.0	"Green house mode"
38	642,729	4,699,349	360.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
39	642,828	4,699,177	382.3	1.0	1.0	1.0	0.0	90.0	"Green house mode"
40	643,010	4,699,356	385.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
41	643,019	4,699,264	389.6	1.0	1.0	1.0	0.0	90.0	"Green house mode"

To be continued on next page...

Project:

2015-08-31_Arkwright Summit_SFA

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217 Montgomery St.

US-SYRACUSE, NY 13202

(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Main Result**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110

...continued from previous page

UTM (north)-NAD27 (US) Zone: 17

No.	East	North	Z	Width	Height	Height a.g.l.	Degrees from south cw	Slope of window	Direction mode
			[m]	[m]	[m]	[m]	[°]	[°]	
42	643,131	4,699,401	388.7	1.0	1.0	1.0	0.0	90.0	"Green house mode"
43	643,293	4,699,304	401.2	1.0	1.0	1.0	0.0	90.0	"Green house mode"
44	645,177	4,694,693	540.9	1.0	1.0	1.0	0.0	90.0	"Green house mode"
49	647,061	4,697,631	395.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
50	647,197	4,696,922	409.1	1.0	1.0	1.0	0.0	90.0	"Green house mode"
55	649,235	4,693,073	431.3	1.0	1.0	1.0	0.0	90.0	"Green house mode"
62	647,566	4,695,024	438.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
63	647,604	4,694,978	439.6	1.0	1.0	1.0	0.0	90.0	"Green house mode"
64	647,042	4,695,304	454.9	1.0	1.0	1.0	0.0	90.0	"Green house mode"
65	646,810	4,695,366	465.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
66	646,831	4,695,542	460.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
67	646,634	4,695,463	475.6	1.0	1.0	1.0	0.0	90.0	"Green house mode"
68	646,626	4,695,534	475.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
69	646,329	4,695,596	485.2	1.0	1.0	1.0	0.0	90.0	"Green house mode"
70	646,375	4,695,725	484.6	1.0	1.0	1.0	0.0	90.0	"Green house mode"
71	645,960	4,695,787	498.7	1.0	1.0	1.0	0.0	90.0	"Green house mode"
72	645,888	4,695,808	500.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
73	645,802	4,695,848	502.6	1.0	1.0	1.0	0.0	90.0	"Green house mode"
74	645,786	4,695,947	502.4	1.0	1.0	1.0	0.0	90.0	"Green house mode"
75	645,738	4,695,963	502.8	1.0	1.0	1.0	0.0	90.0	"Green house mode"
76	645,444	4,696,109	505.3	1.0	1.0	1.0	0.0	90.0	"Green house mode"
77	645,353	4,696,050	507.6	1.0	1.0	1.0	0.0	90.0	"Green house mode"
78	645,529	4,696,070	504.6	1.0	1.0	1.0	0.0	90.0	"Green house mode"
79	645,635	4,696,044	502.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
80	645,342	4,696,139	504.1	1.0	1.0	1.0	0.0	90.0	"Green house mode"
81	645,138	4,696,204	500.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
82	645,096	4,696,213	499.6	1.0	1.0	1.0	0.0	90.0	"Green house mode"
83	645,138	4,696,328	500.5	1.0	1.0	1.0	0.0	90.0	"Green house mode"
84	644,829	4,696,359	504.9	1.0	1.0	1.0	0.0	90.0	"Green house mode"
85	644,670	4,696,427	507.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
86	644,507	4,696,485	502.9	1.0	1.0	1.0	0.0	90.0	"Green house mode"
87	644,526	4,696,652	512.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
88	644,229	4,696,662	500.1	1.0	1.0	1.0	0.0	90.0	"Green house mode"
89	644,175	4,696,615	500.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
90	645,148	4,695,944	505.5	1.0	1.0	1.0	0.0	90.0	"Green house mode"
91	645,088	4,695,973	505.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
92	645,092	4,696,049	500.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
93	645,090	4,695,676	515.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
94	645,090	4,695,511	516.8	1.0	1.0	1.0	0.0	90.0	"Green house mode"
95	645,151	4,695,518	521.3	1.0	1.0	1.0	0.0	90.0	"Green house mode"
96	645,095	4,695,418	522.9	1.0	1.0	1.0	0.0	90.0	"Green house mode"
97	644,799	4,695,434	512.7	1.0	1.0	1.0	0.0	90.0	"Green house mode"
98	644,564	4,695,438	509.8	1.0	1.0	1.0	0.0	90.0	"Green house mode"
99	644,506	4,695,347	515.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
100	644,195	4,695,430	495.9	1.0	1.0	1.0	0.0	90.0	"Green house mode"
101	643,889	4,695,318	496.6	1.0	1.0	1.0	0.0	90.0	"Green house mode"
102	644,027	4,695,371	495.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
103	645,104	4,695,162	527.2	1.0	1.0	1.0	0.0	90.0	"Green house mode"
104	645,169	4,695,044	534.3	1.0	1.0	1.0	0.0	90.0	"Green house mode"
105	645,101	4,694,556	540.8	1.0	1.0	1.0	0.0	90.0	"Green house mode"
106	645,092	4,694,455	539.8	1.0	1.0	1.0	0.0	90.0	"Green house mode"
107	645,131	4,693,985	515.7	1.0	1.0	1.0	0.0	90.0	"Green house mode"
109	645,322	4,694,263	550.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
110	645,736	4,694,179	557.3	1.0	1.0	1.0	0.0	90.0	"Green house mode"

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Project:

2015-08-31_Arkwright Summit_SFA

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Jacob Runner / jrunner@edrdpc.com

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SHADOW - Main Result**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110

...continued from previous page

UTM (north)-NAD27 (US) Zone: 17

No.	East	North	Z	Width	Height	Height a.g.l.	Degrees from south cw	Slope of window	Direction mode
			[m]	[m]	[m]	[m]	[°]	[°]	
111	645,712	4,693,981	546.9	1.0	1.0	1.0	0.0	90.0	"Green house mode"
112	643,825	4,696,854	503.6	1.0	1.0	1.0	0.0	90.0	"Green house mode"
113	645,070	4,696,818	517.7	1.0	1.0	1.0	0.0	90.0	"Green house mode"
114	645,191	4,696,901	520.3	1.0	1.0	1.0	0.0	90.0	"Green house mode"
115	645,042	4,697,493	508.8	1.0	1.0	1.0	0.0	90.0	"Green house mode"
116	645,026	4,697,581	505.7	1.0	1.0	1.0	0.0	90.0	"Green house mode"
117	645,131	4,697,537	505.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
118	645,143	4,697,439	509.1	1.0	1.0	1.0	0.0	90.0	"Green house mode"
119	645,119	4,697,779	503.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
120	645,125	4,697,838	502.4	1.0	1.0	1.0	0.0	90.0	"Green house mode"
121	644,964	4,697,909	502.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
122	645,151	4,697,979	494.8	1.0	1.0	1.0	0.0	90.0	"Green house mode"
123	645,117	4,698,072	495.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
124	645,105	4,698,217	495.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
125	645,118	4,698,296	495.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
126	645,173	4,698,301	495.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
127	645,204	4,698,240	495.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
128	645,228	4,698,315	495.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
129	645,288	4,698,289	495.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
130	645,316	4,698,232	495.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
131	645,279	4,698,190	495.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
132	645,343	4,698,197	495.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
133	645,353	4,698,144	495.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
134	645,287	4,698,133	493.7	1.0	1.0	1.0	0.0	90.0	"Green house mode"
135	645,026	4,698,245	495.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
136	644,943	4,698,250	495.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
137	644,383	4,695,427	512.1	1.0	1.0	1.0	0.0	90.0	"Green house mode"
138	645,020	4,698,399	495.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
139	644,885	4,698,480	492.4	1.0	1.0	1.0	0.0	90.0	"Green house mode"
140	645,086	4,699,206	439.3	1.0	1.0	1.0	0.0	90.0	"Green house mode"
141	645,003	4,699,347	433.6	1.0	1.0	1.0	0.0	90.0	"Green house mode"
142	644,832	4,699,312	435.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
143	642,328	4,697,748	412.7	1.0	1.0	1.0	0.0	90.0	"Green house mode"
144	642,234	4,697,724	401.6	1.0	1.0	1.0	0.0	90.0	"Green house mode"
145	642,683	4,697,776	453.1	1.0	1.0	1.0	0.0	90.0	"Green house mode"
146	642,740	4,697,664	459.1	1.0	1.0	1.0	0.0	90.0	"Green house mode"
147	642,829	4,697,890	465.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
148	642,966	4,697,726	475.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
149	642,982	4,697,832	475.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
150	643,048	4,697,560	466.1	1.0	1.0	1.0	0.0	90.0	"Green house mode"
151	643,112	4,697,716	475.5	1.0	1.0	1.0	0.0	90.0	"Green house mode"
152	643,110	4,697,868	476.9	1.0	1.0	1.0	0.0	90.0	"Green house mode"
153	643,499	4,697,501	487.4	1.0	1.0	1.0	0.0	90.0	"Green house mode"
175	649,351	4,692,676	435.4	1.0	1.0	1.0	0.0	90.0	"Green house mode"
176	649,405	4,692,391	435.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
177	649,382	4,692,564	434.1	1.0	1.0	1.0	0.0	90.0	"Green house mode"
179	642,583	4,699,327	353.3	1.0	1.0	1.0	0.0	90.0	"Green house mode"
182	645,107	4,698,538	490.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
183	645,038	4,698,607	485.1	1.0	1.0	1.0	0.0	90.0	"Green house mode"
184	645,044	4,697,727	505.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
188	647,003	4,697,592	398.9	1.0	1.0	1.0	0.0	90.0	"Green house mode"
189	647,020	4,697,534	397.9	1.0	1.0	1.0	0.0	90.0	"Green house mode"
190	647,098	4,695,119	455.5	1.0	1.0	1.0	0.0	90.0	"Green house mode"
197	648,998	4,693,581	435.2	1.0	1.0	1.0	0.0	90.0	"Green house mode"

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Project:

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SHADOW - Main Result**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110

...continued from previous page

UTM (north)-NAD27 (US) Zone: 17

No.	East	North	Z	Width	Height	Height a.g.l.	Degrees from south cw	Slope of window	Direction mode
			[m]	[m]	[m]	[m]	[°]	[°]	
198	647,627	4,695,264	430.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
199	647,643	4,695,317	430.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
200	645,740	4,698,075	480.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
201	643,772	4,699,370	413.7	1.0	1.0	1.0	0.0	90.0	"Green house mode"
202	643,340	4,699,394	400.4	1.0	1.0	1.0	0.0	90.0	"Green house mode"
204	647,520	4,696,585	387.7	1.0	1.0	1.0	0.0	90.0	"Green house mode"
205	647,515	4,696,494	389.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
206	647,577	4,696,501	385.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
207	647,536	4,696,258	390.9	1.0	1.0	1.0	0.0	90.0	"Green house mode"
208	647,498	4,695,958	402.4	1.0	1.0	1.0	0.0	90.0	"Green house mode"
209	647,538	4,696,295	390.8	1.0	1.0	1.0	0.0	90.0	"Green house mode"
210	647,552	4,696,349	390.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
211	647,485	4,696,278	395.6	1.0	1.0	1.0	0.0	90.0	"Green house mode"
212	643,736	4,696,826	497.4	1.0	1.0	1.0	0.0	90.0	"Green house mode"
213	643,663	4,697,166	498.2	1.0	1.0	1.0	0.0	90.0	"Green house mode"
214	648,308	4,694,372	439.6	1.0	1.0	1.0	0.0	90.0	"Green house mode"
215	648,292	4,694,422	439.3	1.0	1.0	1.0	0.0	90.0	"Green house mode"
216	646,258	4,698,184	427.7	1.0	1.0	1.0	0.0	90.0	"Green house mode"
217	645,668	4,698,144	482.4	1.0	1.0	1.0	0.0	90.0	"Green house mode"
218	645,604	4,698,080	490.5	1.0	1.0	1.0	0.0	90.0	"Green house mode"
219	647,313	4,696,885	402.8	1.0	1.0	1.0	0.0	90.0	"Green house mode"
220	647,624	4,695,532	425.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
221	648,945	4,693,653	434.3	1.0	1.0	1.0	0.0	90.0	"Green house mode"
224	647,417	4,694,413	482.7	1.0	1.0	1.0	0.0	90.0	"Green house mode"
225	647,551	4,694,648	460.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
226	647,302	4,694,845	460.2	1.0	1.0	1.0	0.0	90.0	"Green house mode"
227	647,224	4,695,176	450.2	1.0	1.0	1.0	0.0	90.0	"Green house mode"
228	647,603	4,696,792	375.8	1.0	1.0	1.0	0.0	90.0	"Green house mode"
229	645,006	4,699,629	415.3	1.0	1.0	1.0	0.0	90.0	"Green house mode"
230	645,099	4,699,717	411.9	1.0	1.0	1.0	0.0	90.0	"Green house mode"
231	643,312	4,697,881	476.6	1.0	1.0	1.0	0.0	90.0	"Green house mode"
232	643,243	4,697,803	474.8	1.0	1.0	1.0	0.0	90.0	"Green house mode"
233	646,909	4,694,084	529.4	1.0	1.0	1.0	0.0	90.0	"Green house mode"
235	644,942	4,696,529	519.7	1.0	1.0	1.0	0.0	90.0	"Green house mode"
236	645,054	4,697,302	520.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
237	645,143	4,695,986	504.1	1.0	1.0	1.0	0.0	90.0	"Green house mode"
239	647,502	4,695,252	435.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
242	647,559	4,696,885	379.2	1.0	1.0	1.0	0.0	90.0	"Green house mode"
255	644,281	4,699,765	394.2	1.0	1.0	1.0	0.0	90.0	"Green house mode"
256	644,164	4,699,739	394.4	1.0	1.0	1.0	0.0	90.0	"Green house mode"
257	644,028	4,699,806	385.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
258	644,052	4,699,847	380.7	1.0	1.0	1.0	0.0	90.0	"Green house mode"
366	643,509	4,696,697	477.7	1.0	1.0	1.0	0.0	90.0	"Green house mode"
367	643,404	4,696,643	474.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
370	643,317	4,696,726	470.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
382	643,978	4,695,663	481.5	1.0	1.0	1.0	0.0	90.0	"Green house mode"
383	644,734	4,699,389	429.2	1.0	1.0	1.0	0.0	90.0	"Green house mode"
384	644,716	4,699,131	442.1	1.0	1.0	1.0	0.0	90.0	"Green house mode"
386	646,885	4,698,022	395.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
387	645,304	4,696,973	524.4	1.0	1.0	1.0	0.0	90.0	"Green house mode"
388	645,041	4,696,408	511.8	1.0	1.0	1.0	0.0	90.0	"Green house mode"
389	645,046	4,696,633	517.6	1.0	1.0	1.0	0.0	90.0	"Green house mode"
390	645,284	4,696,114	505.4	1.0	1.0	1.0	0.0	90.0	"Green house mode"
391	645,656	4,696,035	501.4	1.0	1.0	1.0	0.0	90.0	"Green house mode"

To be continued on next page...

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SHADOW - Main Result**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110

...continued from previous page

UTM (north)-NAD27 (US) Zone: 17

No.	East	North	Z	Width	Height	Height a.g.l.	Degrees from south cw	Slope of window	Direction mode
			[m]	[m]	[m]	[m]	[°]	[°]	
392	643,566	4,696,756	483.2	1.0	1.0	1.0	0.0	90.0	"Green house mode"
393	644,458	4,695,343	515.0	1.0	1.0	1.0	0.0	90.0	"Green house mode"
395	647,766	4,695,033	438.2	1.0	1.0	1.0	0.0	90.0	"Green house mode"
402	645,095	4,694,156	522.5	1.0	1.0	1.0	0.0	90.0	"Green house mode"
404	645,344	4,693,900	521.7	1.0	1.0	1.0	0.0	90.0	"Green house mode"
405	649,649	4,693,011	422.3	1.0	1.0	1.0	0.0	90.0	"Green house mode"
406	649,718	4,693,015	421.4	1.0	1.0	1.0	0.0	90.0	"Green house mode"

Calculation Results

Shadow receptor

No.	Shadow, worst case			Shadow, expected values	
	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]	
1	10:29	34	0:25	3:42	
2	65:18	77	1:01	10:48	
3	0:00	0	0:00	0:00	
7	11:36	37	0:25	3:04	
9	14:59	43	0:27	3:31	
10	33:34	72	0:32	6:49	
11	4:25	21	0:16	0:50	
12	0:00	0	0:00	0:00	
13	0:00	0	0:00	0:00	
14	0:00	0	0:00	0:00	
15	0:00	0	0:00	0:00	
16	38:50	80	0:50	7:36	
17	40:02	83	0:47	9:02	
18	36:36	86	0:39	8:11	
19	18:25	49	0:32	4:42	
20	30:26	74	0:44	7:10	
21	6:56	24	0:21	1:20	
22	19:50	56	0:30	4:16	
23	12:54	43	0:27	3:04	
24	15:11	48	0:28	3:27	
25	12:34	36	0:27	2:27	
26	25:58	54	0:35	5:12	
27	28:54	60	0:34	5:49	
28	48:33	93	0:48	9:27	
29	48:14	99	0:49	8:44	
30	45:28	103	0:32	8:10	
31	6:49	26	0:20	1:04	
32	0:00	0	0:00	0:00	
33	11:20	34	0:26	3:23	
34	10:21	33	0:25	2:45	
35	20:02	50	0:31	4:00	
36	28:28	81	0:29	6:28	
37	82:28	170	0:44	20:53	
38	56:08	86	0:45	9:27	
39	99:02	130	1:05	20:32	
40	21:54	58	0:30	3:51	
41	65:09	107	1:00	11:58	
42	35:15	72	0:33	5:52	
43	76:41	78	1:24	13:02	

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2015-08-31_Arkwright Summit_SFA

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8/31/2015 10:27 AM/2.9.285

SHADOW - Main Result**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110

...continued from previous page

No.	Shadow, worst case		Shadow, expected values	
	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
44	105:09	171	0:55	38:20
49	11:52	35	0:27	3:42
50	49:01	129	0:33	13:26
55	63:24	79	1:10	22:36
62	31:07	82	0:32	8:55
63	28:16	75	0:31	8:33
64	17:52	43	0:32	5:27
65	39:19	75	0:41	8:59
66	30:04	60	0:35	6:04
67	19:36	42	0:35	3:51
68	0:00	0	0:00	0:00
69	44:19	108	0:30	10:32
70	23:53	76	0:27	5:36
71	65:33	136	0:40	23:47
72	31:40	83	0:35	13:06
73	16:16	50	0:29	6:16
74	17:03	78	0:28	6:22
75	22:03	95	0:25	8:44
76	22:30	89	0:31	7:28
77	19:59	45	0:35	6:19
78	17:45	52	0:28	5:37
79	27:45	99	0:30	9:50
80	20:21	45	0:35	6:13
81	39:23	68	0:45	10:15
82	48:08	79	0:48	11:41
83	54:11	90	0:41	11:09
84	42:00	80	0:36	18:09
85	18:41	49	0:29	7:13
86	11:22	36	0:25	4:06
87	10:32	32	0:26	3:26
88	0:00	0	0:00	0:00
89	0:00	0	0:00	0:00
90	41:19	66	0:49	13:50
91	50:45	72	0:55	16:48
92	45:58	68	0:53	14:49
93	77:10	128	0:44	19:05
94	64:53	119	0:49	13:07
95	67:54	108	0:54	13:13
96	89:57	145	0:52	19:52
97	34:58	89	0:33	8:10
98	10:53	33	0:26	3:04
99	9:54	31	0:25	3:02
100	0:00	0	0:00	0:00
101	19:59	57	0:27	3:28
102	28:12	62	0:31	4:38
103	177:52	258	0:58	53:04
104	124:14	193	0:52	39:56
105	12:35	48	0:24	4:10
106	8:59	32	0:24	2:57
107	0:00	0	0:00	0:00
109	27:42	80	0:30	9:56
110	54:53	113	0:43	18:21
111	69:08	128	0:41	27:59
112	50:41	83	0:42	21:50

To be continued on next page...

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SHADOW - Main Result**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110

...continued from previous page

No.	Shadow, worst case		Shadow, expected values	
	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
113	120:36	224	0:52	41:06
114	173:40	236	1:19	48:09
115	97:28	186	0:53	23:25
116	96:46	153	0:59	22:55
117	78:05	184	0:55	19:55
118	104:24	214	0:58	25:53
119	47:57	117	0:46	11:43
120	36:04	95	0:42	8:24
121	54:33	125	0:58	13:26
122	46:39	108	0:32	8:37
123	39:16	84	0:38	7:23
124	68:45	126	0:54	24:51
125	87:20	112	1:02	35:39
126	73:11	118	0:51	30:08
127	22:41	62	0:30	8:06
128	61:59	117	0:49	25:38
129	14:34	45	0:28	5:01
130	14:51	48	0:27	5:14
131	19:40	61	0:28	7:04
132	14:37	49	0:26	5:12
133	16:54	58	0:25	6:06
134	28:28	82	0:27	10:35
135	93:14	87	1:19	37:38
136	90:32	133	1:08	35:26
137	0:00	0	0:00	0:00
138	68:33	71	1:28	24:23
139	85:00	125	1:10	28:40
140	88:00	76	1:27	15:30
141	1:25	11	0:10	0:13
142	70:16	76	1:06	12:40
143	0:00	0	0:00	0:00
144	6:36	29	0:17	2:56
145	26:35	63	0:30	11:40
146	0:00	0	0:00	0:00
147	63:20	147	0:36	25:10
148	40:54	119	0:27	13:52
149	39:04	112	0:28	12:07
150	38:59	114	0:30	14:02
151	70:55	169	0:32	25:56
152	53:29	136	0:32	15:34
153	96:10	149	1:21	30:55
175	0:00	0	0:00	0:00
176	0:00	0	0:00	0:00
177	0:00	0	0:00	0:00
179	32:21	68	0:37	5:59
182	68:03	73	1:26	22:22
183	62:54	85	1:16	19:45
184	49:16	108	0:57	12:43
188	13:30	37	0:29	4:17
189	26:06	78	0:28	7:11
190	119:59	162	1:02	28:58
197	92:37	168	0:47	23:00
198	14:49	41	0:28	4:08
199	14:45	43	0:27	3:42

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SHADOW - Main Result**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110

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No.	Shadow, worst case		Shadow, expected values	
	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
200	0:00	0	0:00	0:00
201	38:10	93	0:34	7:52
202	19:18	38	0:44	3:04
204	11:16	34	0:26	3:39
205	21:55	66	0:27	6:58
206	10:32	33	0:25	3:29
207	24:37	75	0:26	8:16
208	13:00	39	0:26	4:29
209	23:35	71	0:26	7:54
210	21:54	68	0:26	7:19
211	27:07	78	0:28	9:07
212	45:51	86	0:36	19:38
213	54:01	109	0:38	21:19
214	0:00	0	0:00	0:00
215	0:00	0	0:00	0:00
216	0:00	0	0:00	0:00
217	0:00	0	0:00	0:00
218	0:00	0	0:00	0:00
219	27:45	77	0:30	8:05
220	25:21	68	0:26	5:08
221	61:42	137	0:37	15:50
224	36:34	88	0:36	12:08
225	43:06	102	0:35	14:45
226	85:30	129	1:11	27:50
227	71:22	137	0:48	17:28
228	8:57	30	0:23	2:48
229	0:00	0	0:00	0:00
230	0:00	0	0:00	0:00
231	127:39	266	0:43	36:16
232	97:01	197	0:38	32:59
233	163:27	257	1:03	52:14
235	45:11	109	0:43	17:33
236	84:56	184	0:44	25:59
237	40:07	63	0:49	13:07
239	20:38	50	0:32	5:15
242	9:50	32	0:24	2:56
255	0:00	0	0:00	0:00
256	0:00	0	0:00	0:00
257	0:00	0	0:00	0:00
258	0:00	0	0:00	0:00
366	29:07	73	0:28	12:38
367	0:00	0	0:00	0:00
370	0:00	0	0:00	0:00
382	51:06	95	0:38	21:31
383	37:55	66	0:50	6:26
384	83:52	146	0:56	18:44
386	24:41	62	0:27	4:59
387	183:41	251	1:29	49:01
388	29:30	69	0:38	12:01
389	70:13	133	0:52	26:40
390	24:04	49	0:38	7:25
391	29:56	107	0:29	10:47
392	33:51	84	0:29	14:28
393	9:01	30	0:23	2:47

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SHADOW - Main Result**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110

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No.	Shadow, worst case		Shadow, expected values	
	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
395	11:08	33	0:26	3:33
402	0:00	0	0:00	0:00
404	16:25	50	0:26	6:37
405	12:52	39	0:26	4:26
406	10:59	36	0:24	3:47

Total amount of flickering on the shadow receptors caused by each WTG

No.	Name	Worst case [h/year]	Expected [h/year]
10	VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (122)	77:02	23:49
11	VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (137)	27:14	4:28
12	VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (138)	0:00	0:00
15	VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (124)	111:10	35:52
16	VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (128)	165:58	63:24
19	VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (132)	351:21	98:57
21	VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (133)	233:40	59:41
22	VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (140)	366:09	105:08
27	VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (125)	134:05	42:51
28	VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (126)	27:30	9:02
29	VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (127)	40:40	11:58
30	VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (139)	357:01	99:12
32	VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (121)	122:39	30:56
33	VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (116)	207:16	63:00
36	VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (130)	182:06	62:47
41	VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (136)	150:28	36:32
43	VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (142)	114:50	38:37
47	VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (143)	51:23	22:12
49	VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (150)	256:48	51:19
50	VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (141)	31:20	7:01
51	VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (149)	184:39	61:32
57	VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (129)	140:03	35:31
66	VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (120)	200:23	50:44
69	VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (151)	41:27	8:35
93	VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (117)	0:00	0:00
95	VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (119)	24:06	7:49
96	VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (123)	68:44	21:16
97	VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (118)	125:34	33:25
100	VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (134)	68:32	19:19
101	VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (144)	144:22	56:40
102	VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (146)	133:02	49:57
103	VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (148)	233:23	45:31
105	VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (115)	280:32	75:51
110	VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (147)	334:59	73:32
111	VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (152)	157:35	40:57
112	VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (145)	226:46	69:42
114	VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (131)	62:14	21:20
115	VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (135)	281:42	89:20

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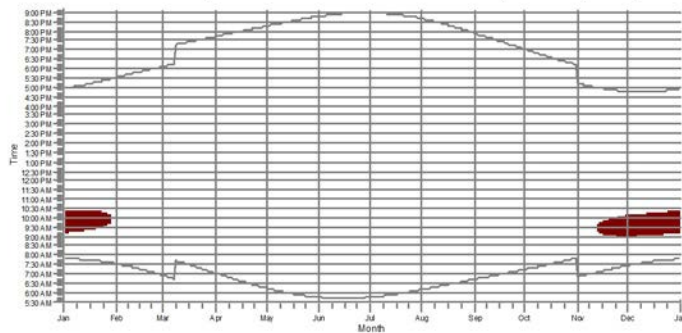
Calculated:

8/31/2015 10:27 AM/2.9.285

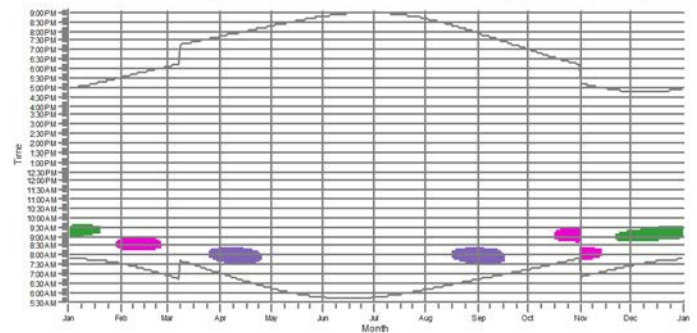
SHADOW - Calendar, graphical

Calculation: 2015-08-31_Arkwright Summit SFA_Vestas V110

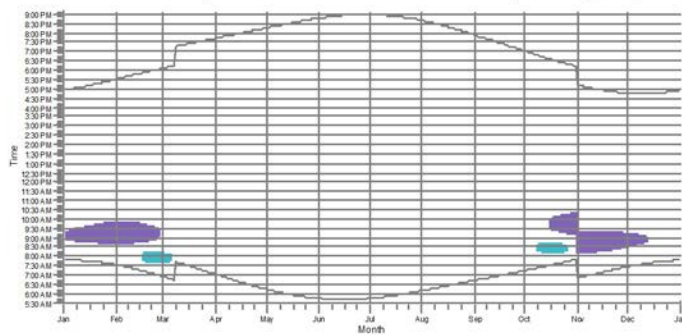
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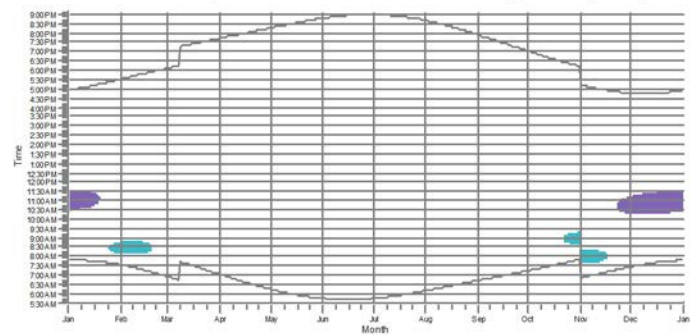
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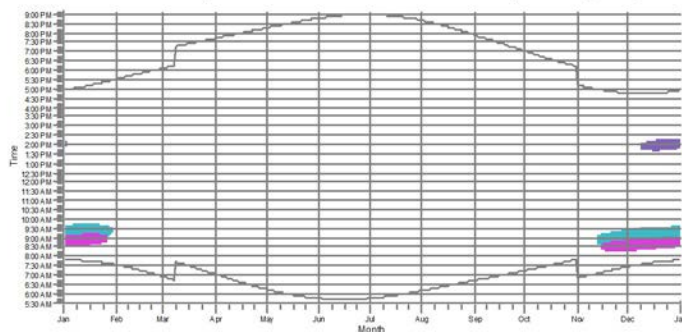
39: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1250)



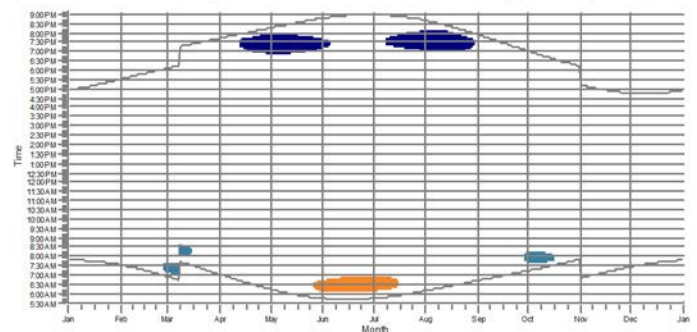
41: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1252)



43: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1254)



44: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1255)



WTGs

21: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (133)

22: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (140)

49: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (150)

50: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (141)

66: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (120)

69: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (151)

110: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (147)

111: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (152)

114: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (131)

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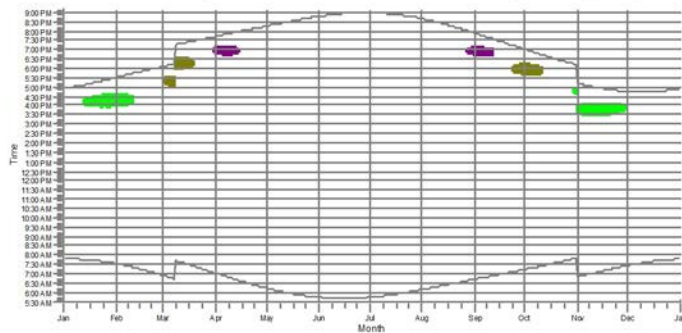
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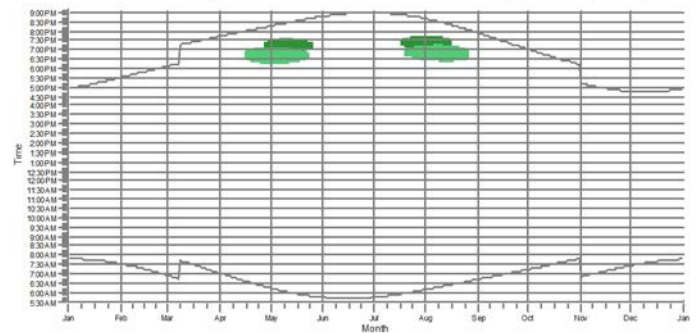
SHADOW - Calendar, graphical

Calculation: 2015-08-31_Arkwright Summit SFA_Vestas V110

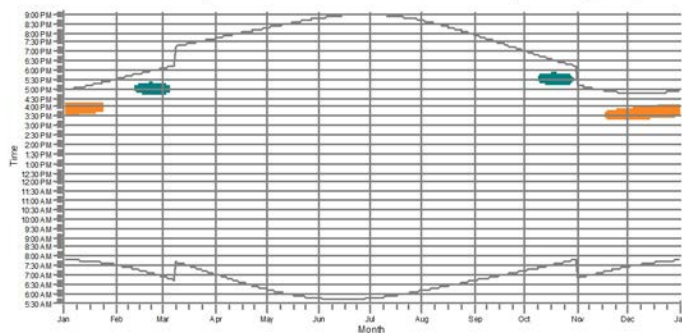
50: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1257)



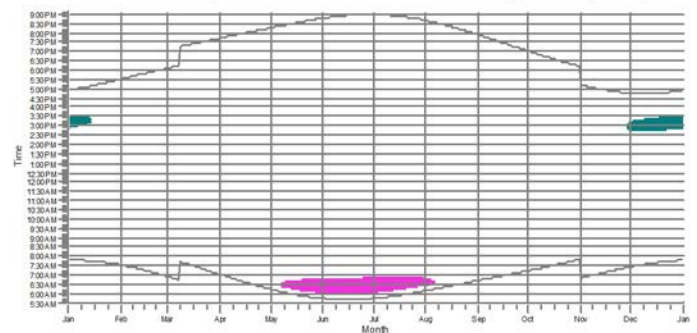
55: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1258)



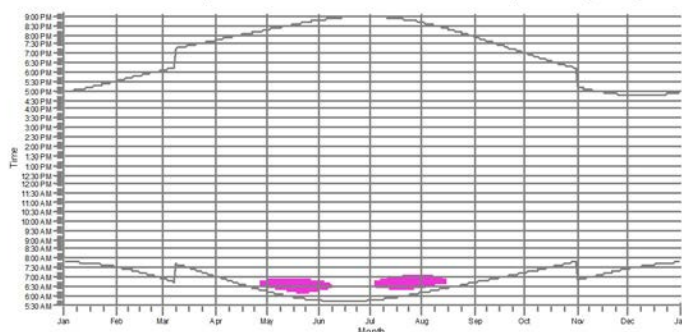
69: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1266)



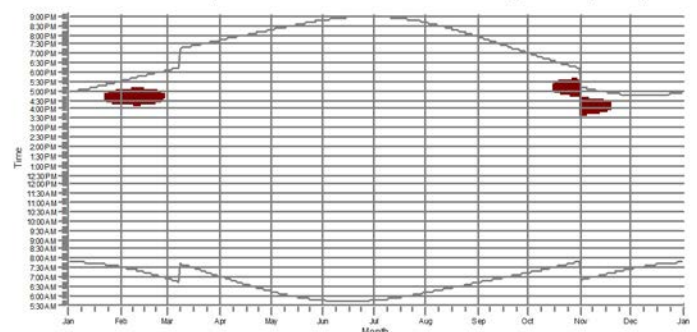
71: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1268)



72: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1269)



81: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1278)



WTGs

19: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (132)
22: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (140)
27: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (125)

28: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (126)
29: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (127)
66: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (120)

96: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (123)
97: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (118)
102: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (146)

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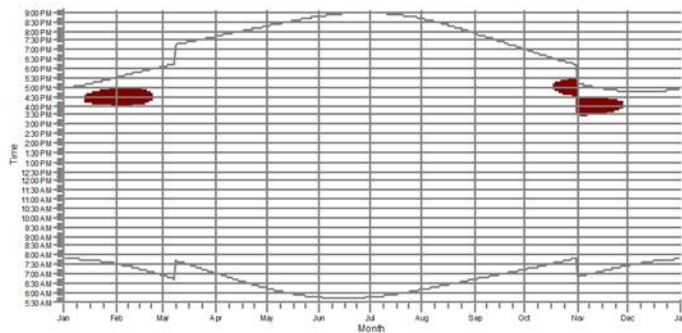
Calculated:

8/31/2015 10:27 AM/2.9.285

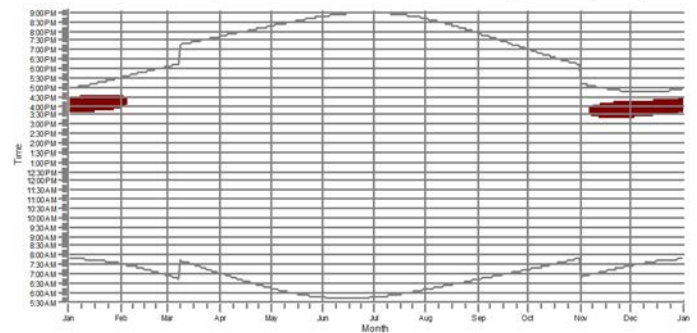
SHADOW - Calendar, graphical

Calculation: 2015-08-31_Arkwright Summit SFA_Vestas V110

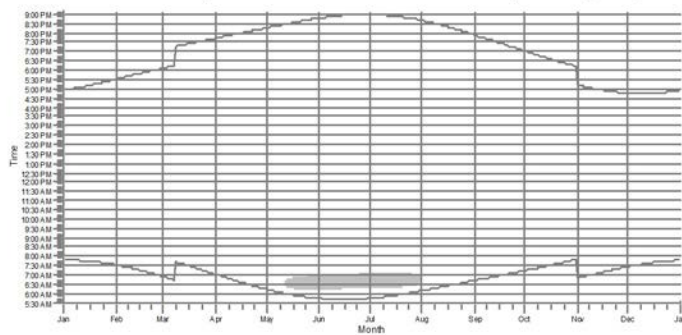
82: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1279)



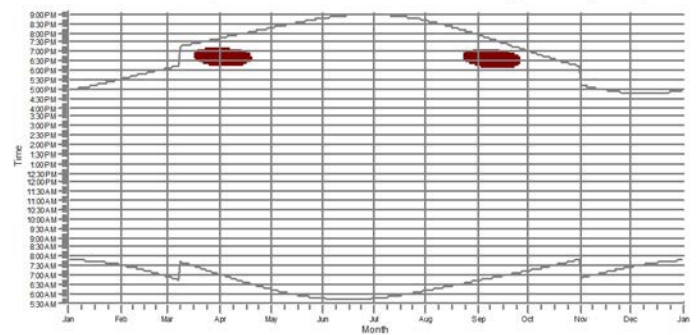
83: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1280)



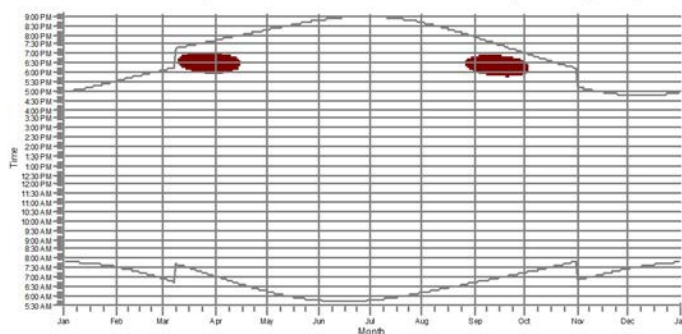
84: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1281)



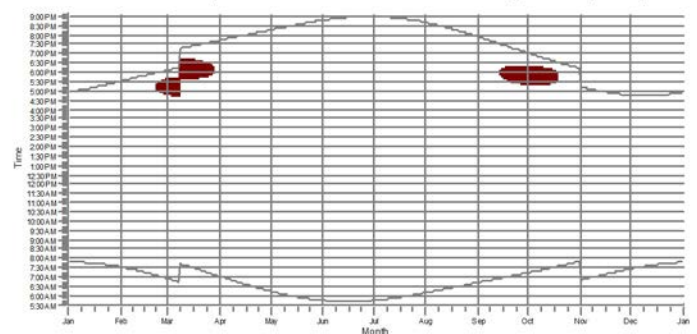
90: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1287)



91: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1288)



92: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1289)



WTGs

22: VESTAS V110-2.0 2000 110.0 IOI hub: 95.0 m (TOT: 150.0 m) (140)

30: VESTAS V110-2.0 2000 110.0 IOI hub: 95.0 m (TOT: 150.0 m) (139)

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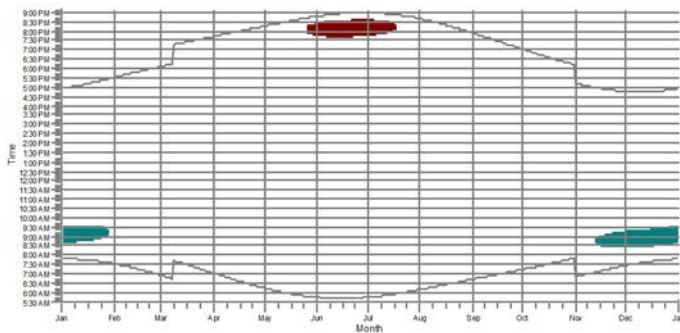
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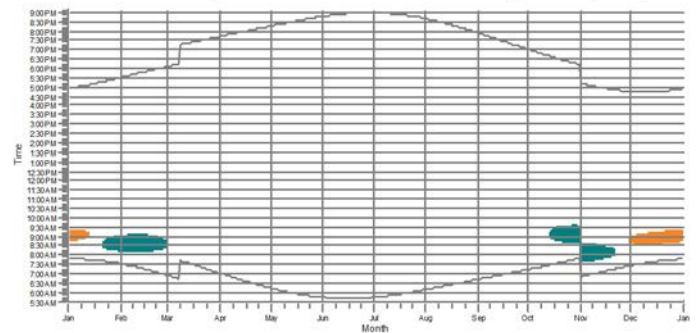
SHADOW - Calendar, graphical

Calculation: 2015-08-31_Arkwright Summit SFA_Vestas V110

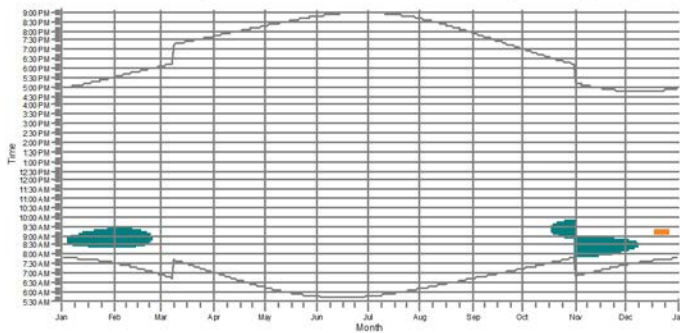
93: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1290)



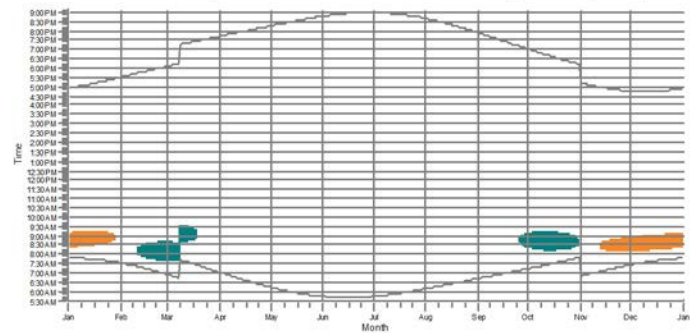
94: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1291)



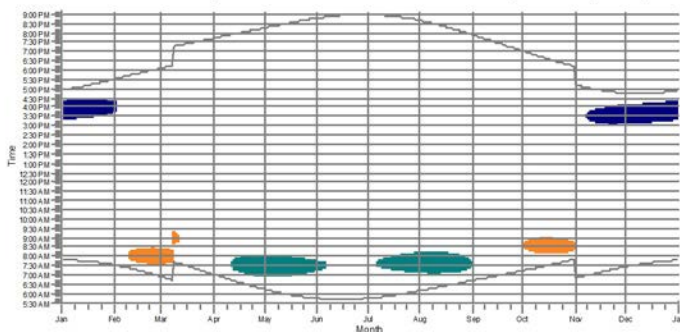
95: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1292)



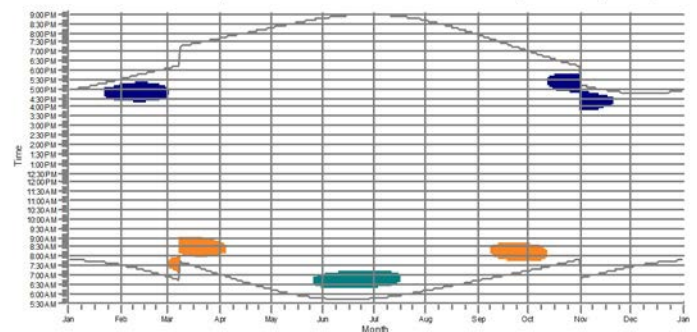
96: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1293)



103: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1300)



104: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1301)



WTGs

19: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (132)

21: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (133)

22: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (140)

66: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (120)

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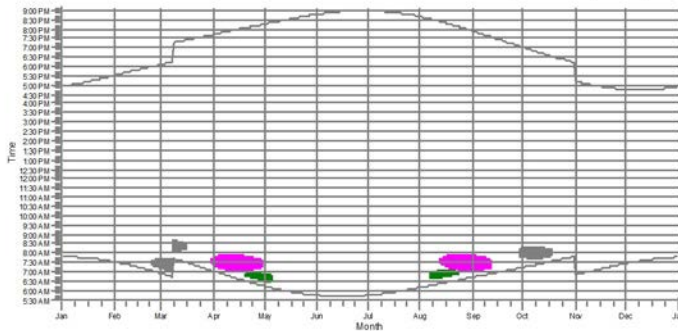
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8/31/2015 10:27 AM/2.9.285

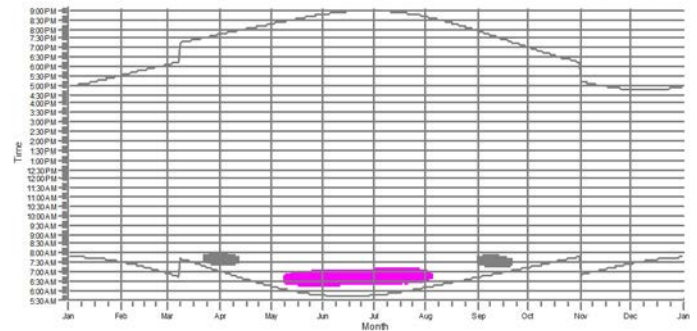
SHADOW - Calendar, graphical

Calculation: 2015-08-31_Arkwright Summit SFA_Vestas V110

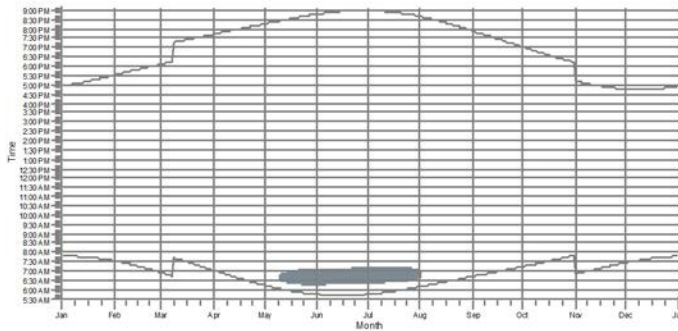
110: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1306)



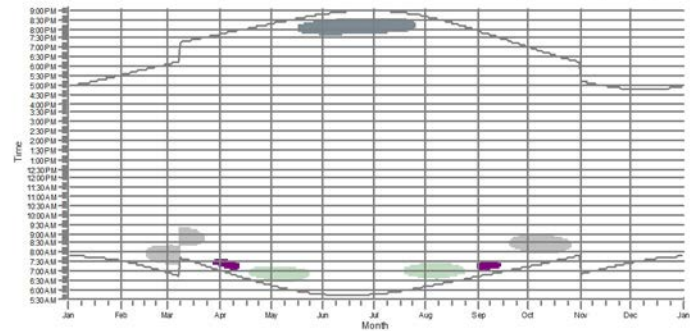
111: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1307)



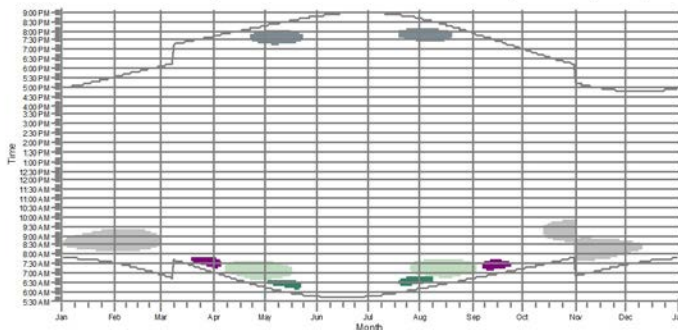
112: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1308)



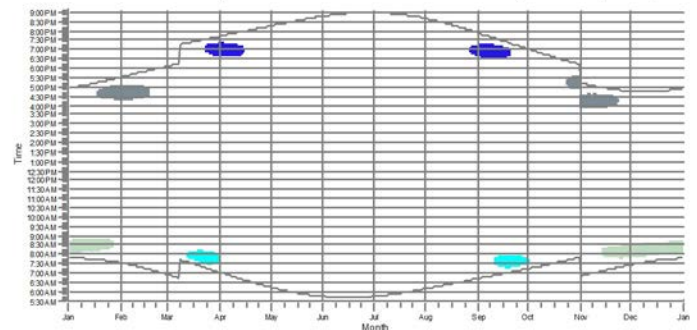
113: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1309)



114: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1310)



115: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1311)



WTGs

10: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (122)
 15: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (124)
 16: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (128)
 29: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (127)

30: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (139)
 32: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (121)
 33: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (116)
 100: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (134)

112: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (145)
 115: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (135)

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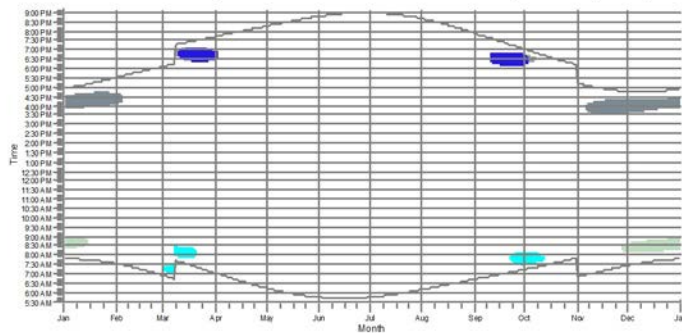
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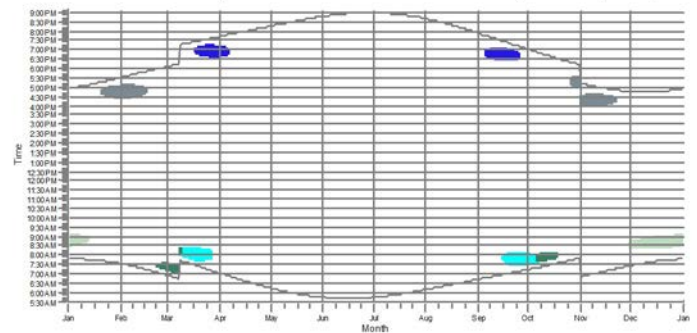
SHADOW - Calendar, graphical

Calculation: 2015-08-31_Arkwright Summit SFA_Vestas V110

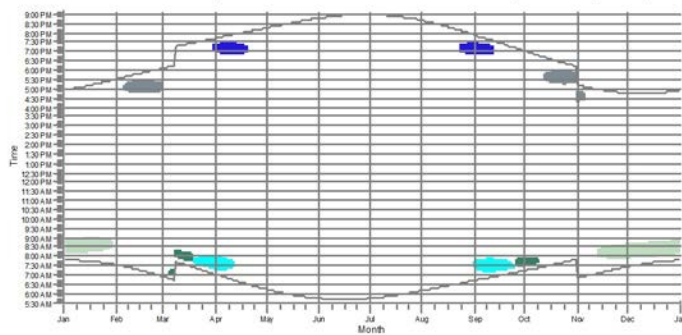
116: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1312)



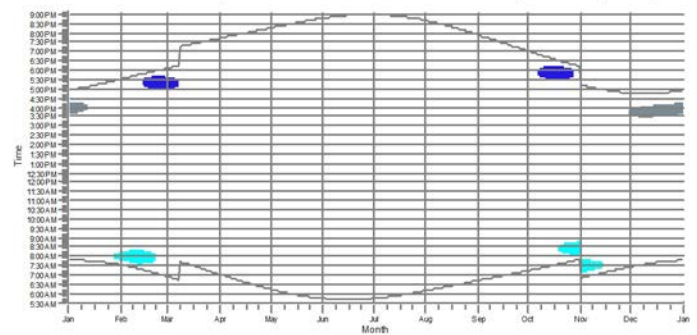
117: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1313)



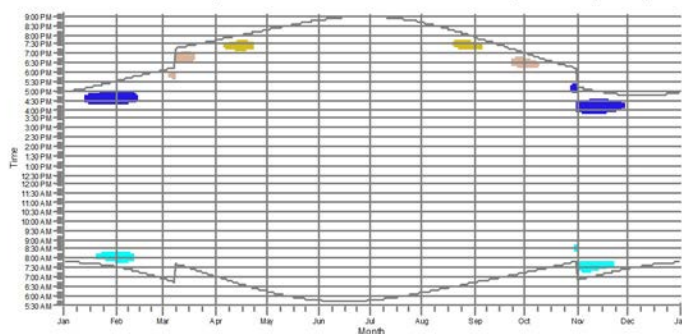
118: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1314)



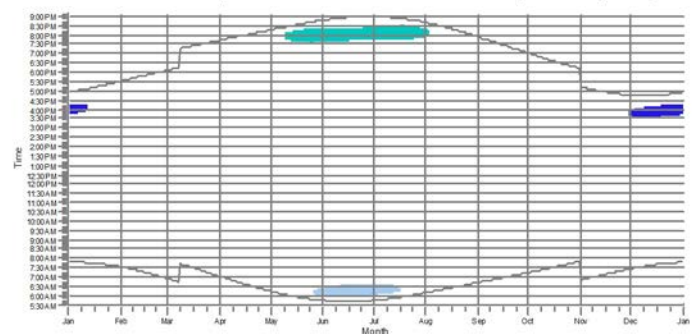
119: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1315)



121: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1317)



124: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1320)



WTGs

32: VESTAS V110-2.0 2000 110.0 IOI hub: 95.0 m (TOT: 150.0 m) (121)

33: VESTAS V110-2.0 2000 110.0 IOI hub: 95.0 m (TOT: 150.0 m) (116)

36: VESTAS V110-2.0 2000 110.0 IOI hub: 95.0 m (TOT: 150.0 m) (130)

41: VESTAS V110-2.0 2000 110.0 IOI hub: 95.0 m (TOT: 150.0 m) (136)

43: VESTAS V110-2.0 2000 110.0 IOI hub: 95.0 m (TOT: 150.0 m) (142)

51: VESTAS V110-2.0 2000 110.0 IOI hub: 95.0 m (TOT: 150.0 m) (149)

100: VESTAS V110-2.0 2000 110.0 IOI hub: 95.0 m (TOT: 150.0 m) (134)

101: VESTAS V110-2.0 2000 110.0 IOI hub: 95.0 m (TOT: 150.0 m) (144)

112: VESTAS V110-2.0 2000 110.0 IOI hub: 95.0 m (TOT: 150.0 m) (145)

115: VESTAS V110-2.0 2000 110.0 IOI hub: 95.0 m (TOT: 150.0 m) (135)

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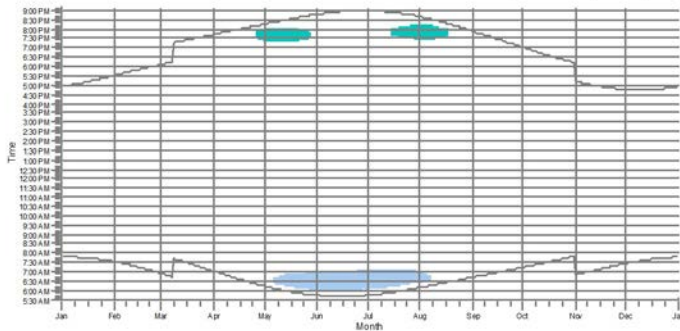
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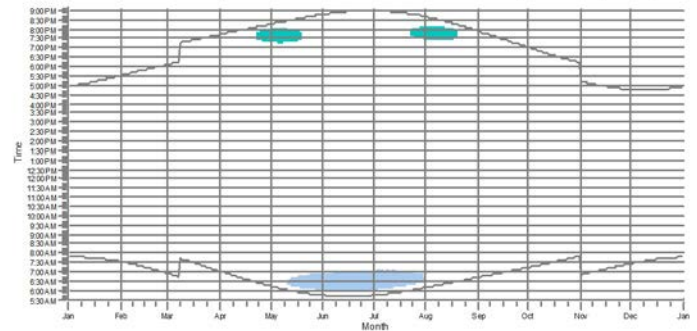
SHADOW - Calendar, graphical

Calculation: 2015-08-31_Arkwright Summit SFA_Vestas V110

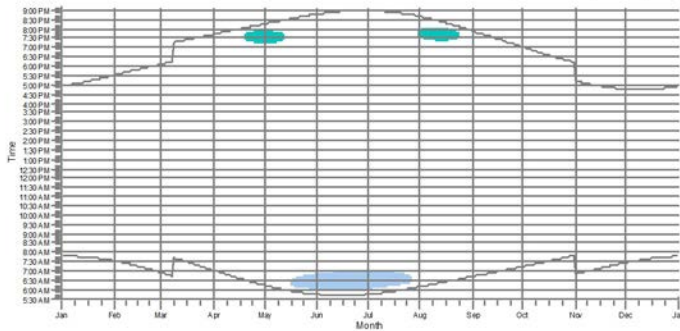
125: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1321)



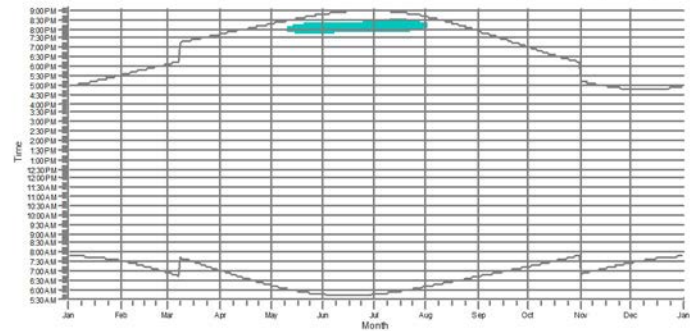
126: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1322)



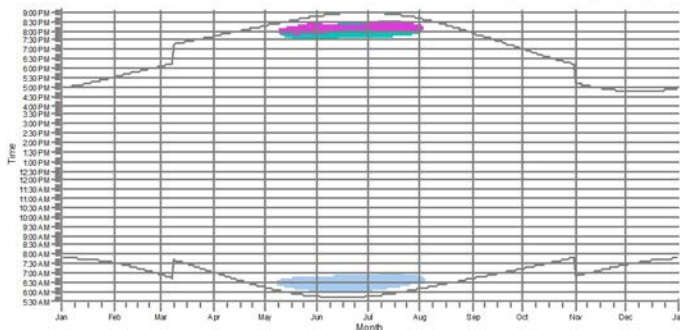
128: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1324)



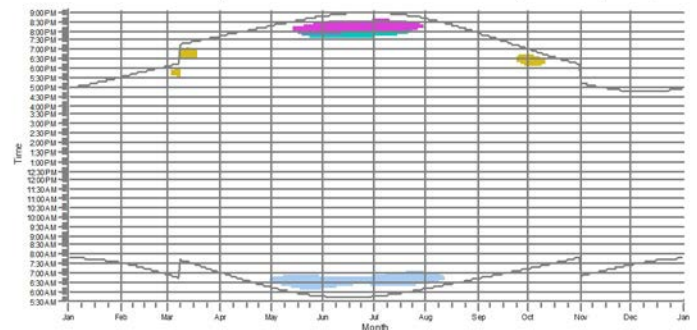
134: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1330)



135: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1331)



136: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1332)



WTGs

36: VESTAS V110-2.0 2000 110.0 IOI hub: 95.0 m (TOT: 150.0 m) (130)
51: VESTAS V110-2.0 2000 110.0 IOI hub: 95.0 m (TOT: 150.0 m) (149)

101: VESTAS V110-2.0 2000 110.0 IOI hub: 95.0 m (TOT: 150.0 m) (144)
111: VESTAS V110-2.0 2000 110.0 IOI hub: 95.0 m (TOT: 150.0 m) (152)

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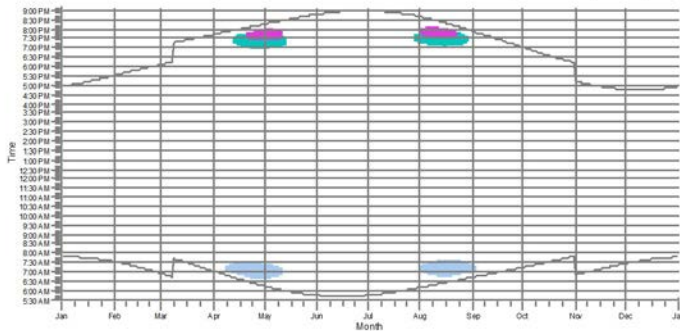
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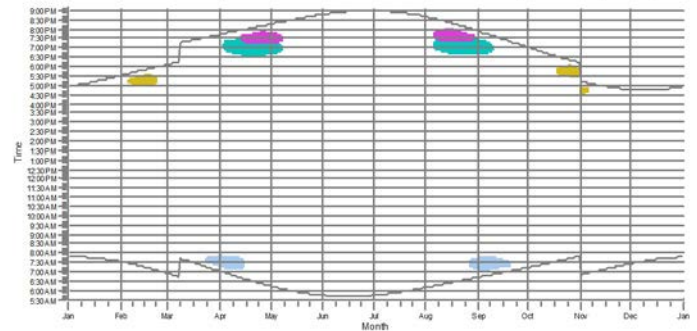
SHADOW - Calendar, graphical

Calculation: 2015-08-31_Arkwright Summit SFA_Vestas V110

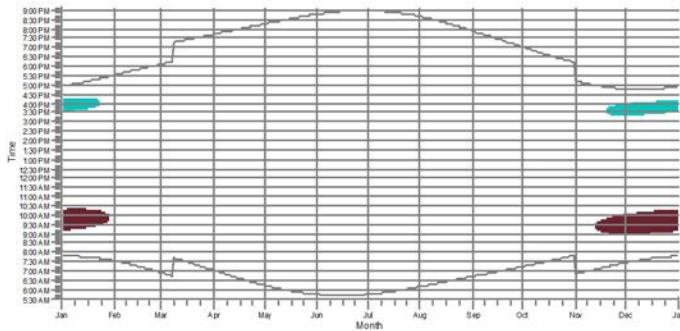
138: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1334)



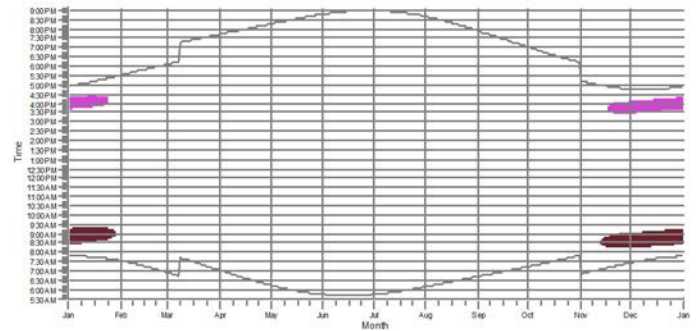
139: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1335)



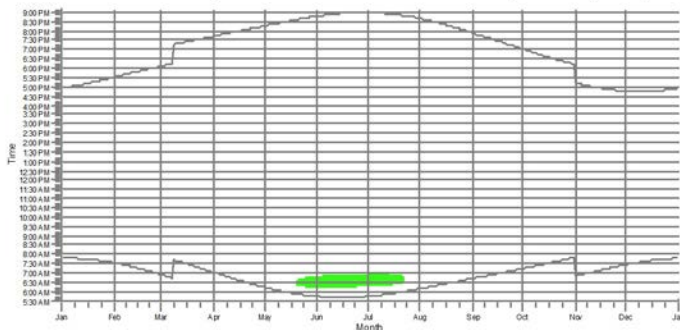
140: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1336)



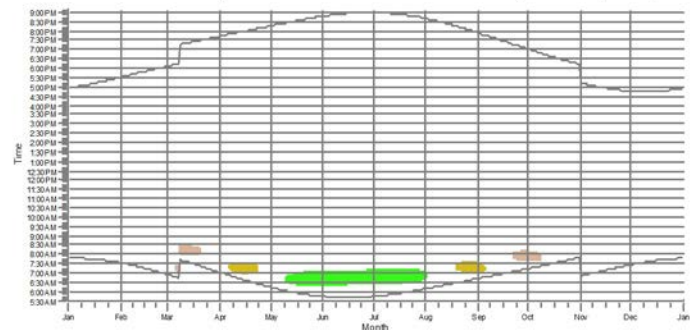
142: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1338)



145: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1341)



147: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1343)



WTGs

36: VESTAS V110-2.0 2000 110.0 IOI hub: 95.0 m (TOT: 150.0 m) (130)
 43: VESTAS V110-2.0 2000 110.0 IOI hub: 95.0 m (TOT: 150.0 m) (142)
 47: VESTAS V110-2.0 2000 110.0 IOI hub: 95.0 m (TOT: 150.0 m) (143)

51: VESTAS V110-2.0 2000 110.0 IOI hub: 95.0 m (TOT: 150.0 m) (149)
 101: VESTAS V110-2.0 2000 110.0 IOI hub: 95.0 m (TOT: 150.0 m) (144)
 103: VESTAS V110-2.0 2000 110.0 IOI hub: 95.0 m (TOT: 150.0 m) (148)

111: VESTAS V110-2.0 2000 110.0 IOI hub: 95.0 m (TOT: 150.0 m) (152)

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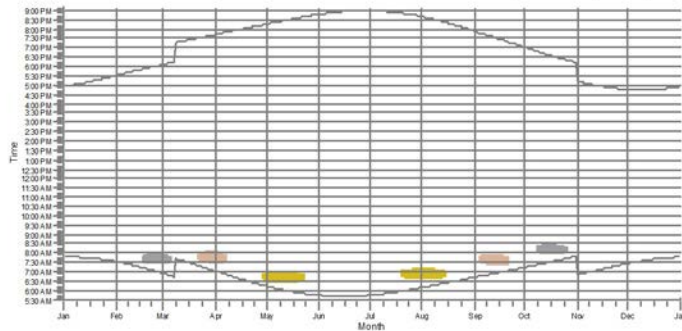
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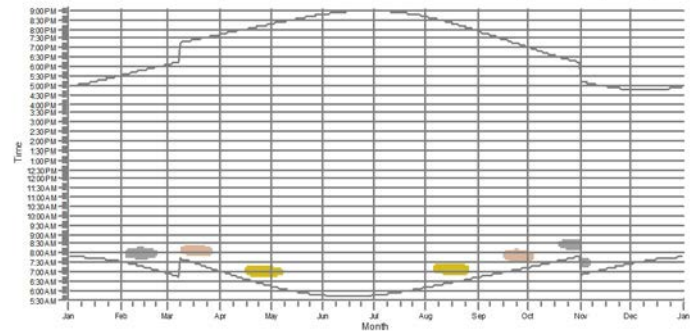
SHADOW - Calendar, graphical

Calculation: 2015-08-31_Arkwright Summit SFA_Vestas V110

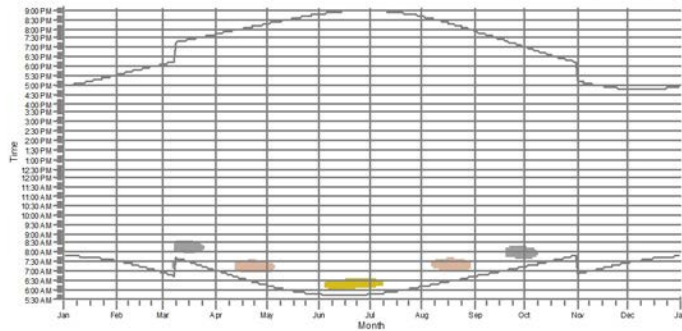
148: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1344)



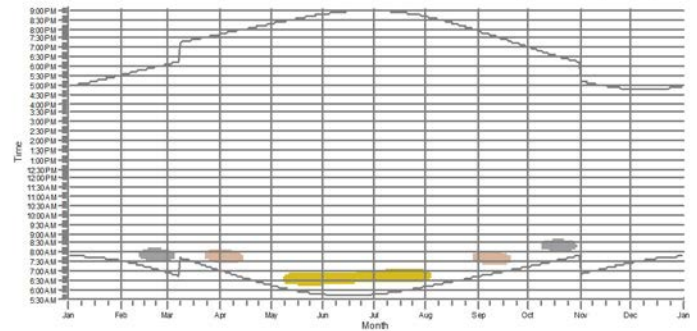
149: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1345)



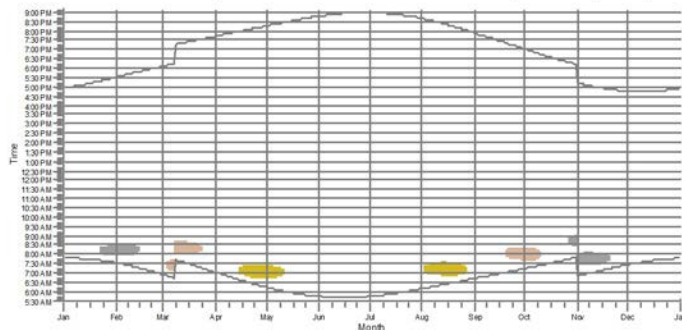
150: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1346)



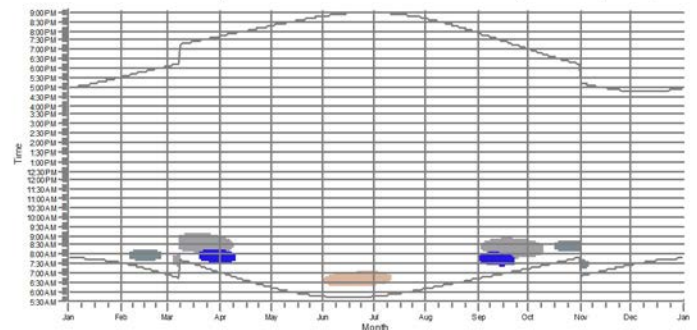
151: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1347)



152: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1348)



153: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1349)



WTGs

41: VESTAS V110-2.0 2000 110.0 IOI hub: 95.0 m (TOT: 150.0 m) (136)
43: VESTAS V110-2.0 2000 110.0 IOI hub: 95.0 m (TOT: 150.0 m) (142)

101: VESTAS V110-2.0 2000 110.0 IOI hub: 95.0 m (TOT: 150.0 m) (144)
112: VESTAS V110-2.0 2000 110.0 IOI hub: 95.0 m (TOT: 150.0 m) (145)

115: VESTAS V110-2.0 2000 110.0 IOI hub: 95.0 m (TOT: 150.0 m) (135)

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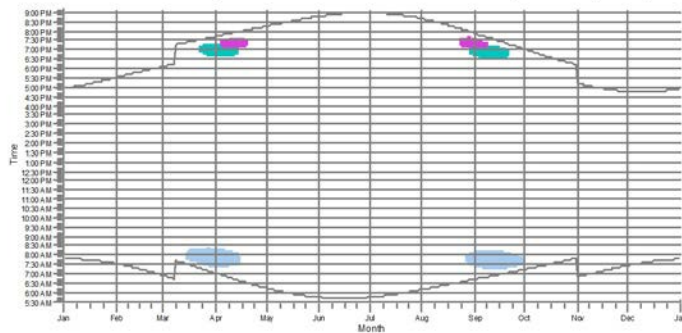
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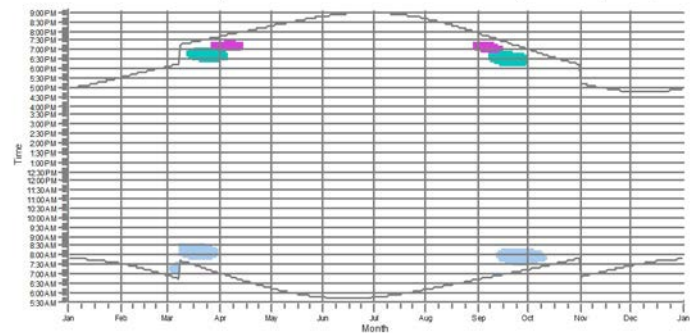
SHADOW - Calendar, graphical

Calculation: 2015-08-31_Arkwright Summit SFA_Vestas V110

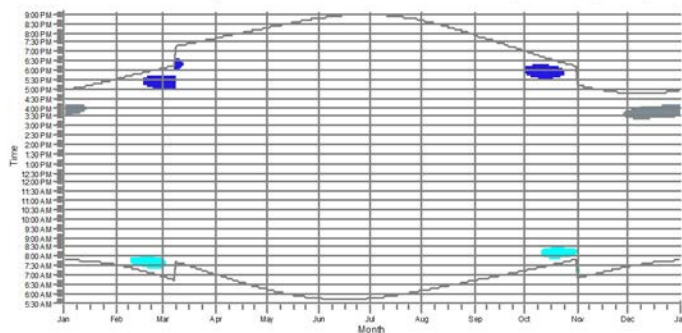
182: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1354)



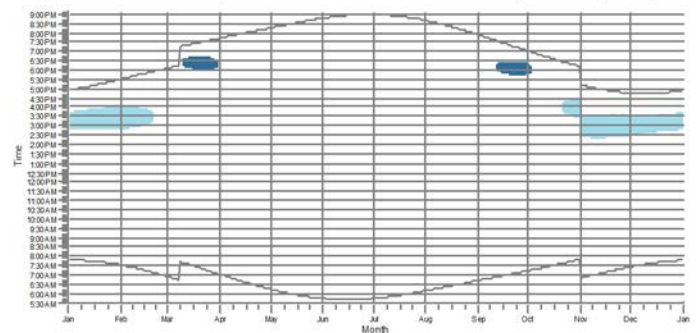
183: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1355)



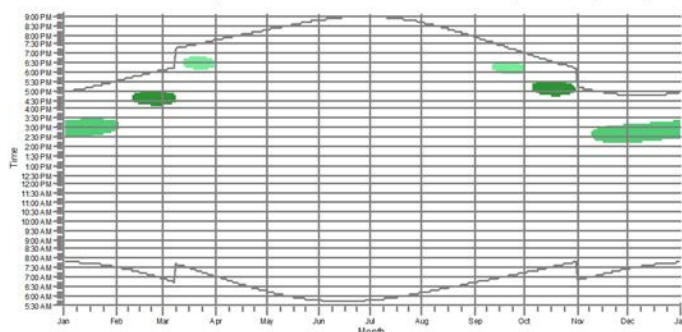
184: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1356)



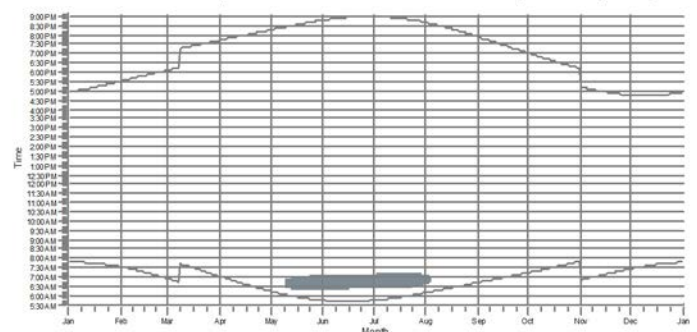
190: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1359)



197: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1360)



212: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1374)



WTGs

32: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (121)
 36: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (130)
 51: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (149)
 57: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (129)

95: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (119)
 96: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (123)
 97: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (118)
 105: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (115)

111: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (152)
 112: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (145)
 115: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (135)

Project:

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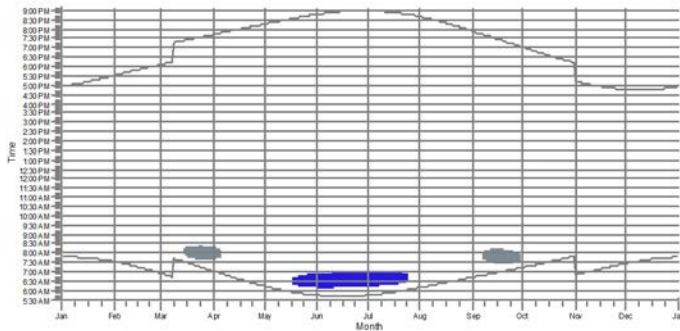
Calculated:

8/31/2015 10:27 AM/2.9.285

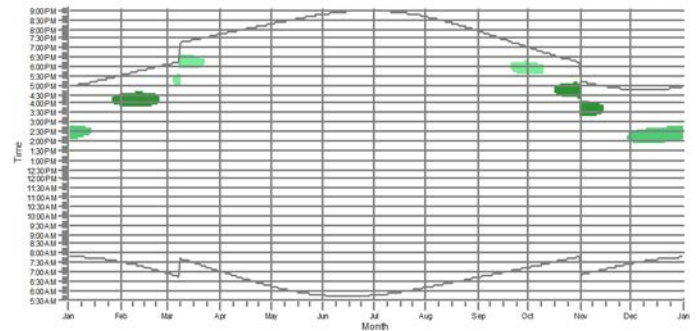
SHADOW - Calendar, graphical

Calculation: 2015-08-31_Arkwright Summit SFA_Vestas V110

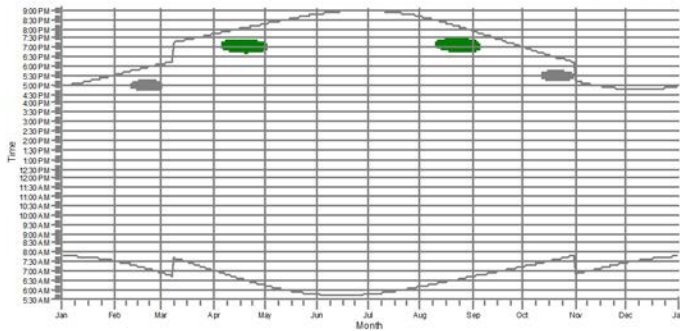
213: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1375)



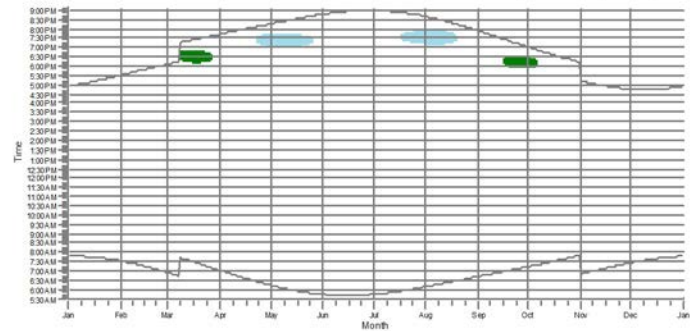
221: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1383)



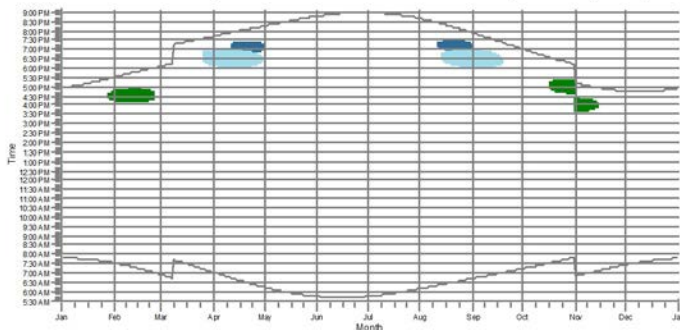
224: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1384)



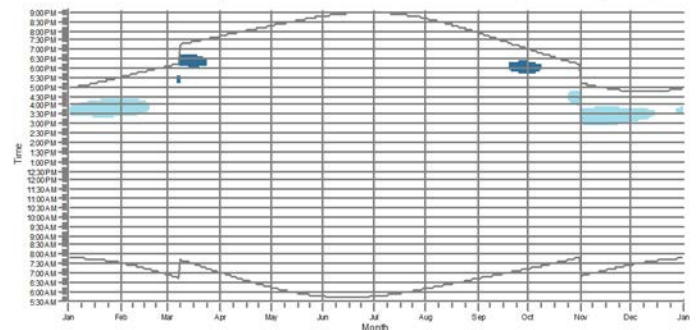
225: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1385)



226: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1386)



227: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1387)



WTGs

10: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (122)
15: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (124)
57: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (129)

95: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (119)
96: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (123)
97: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (118)

105: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (115)
112: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (145)
115: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (135)

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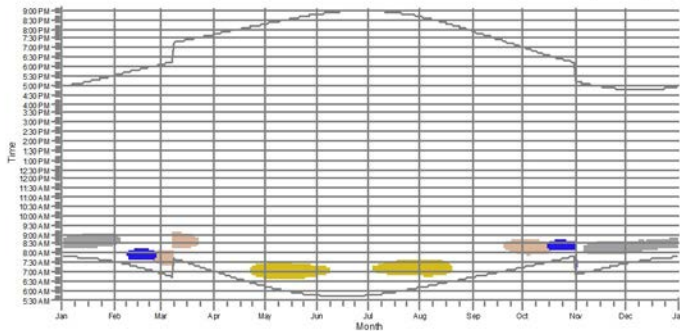
Calculated:

8/31/2015 10:27 AM/2.9.285

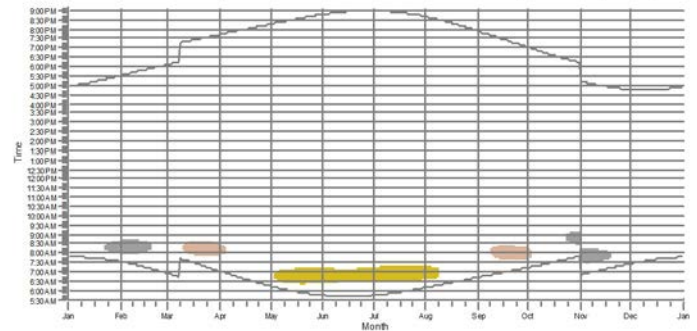
SHADOW - Calendar, graphical

Calculation: 2015-08-31_Arkwright Summit SFA_Vestas V110

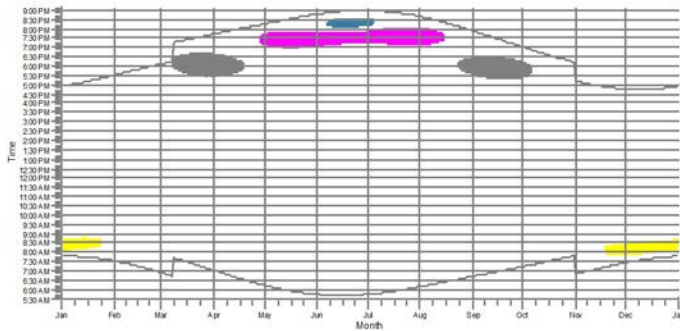
231: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1391)



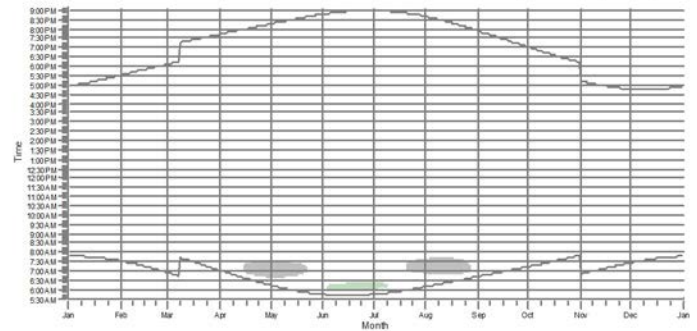
232: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1392)



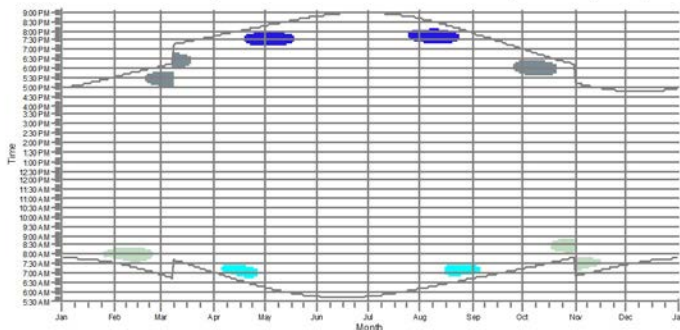
233: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1393)



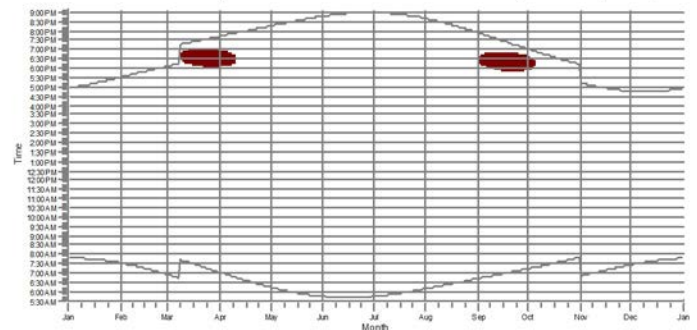
235: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1394)



236: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1395)



237: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1396)



WTGs

11: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (137)
 15: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (124)
 16: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (128)
 22: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (140)
 30: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (139)

32: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (121)
 33: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (116)
 41: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (136)
 43: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (142)
 101: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (144)

112: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (145)
 114: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (131)
 115: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (135)

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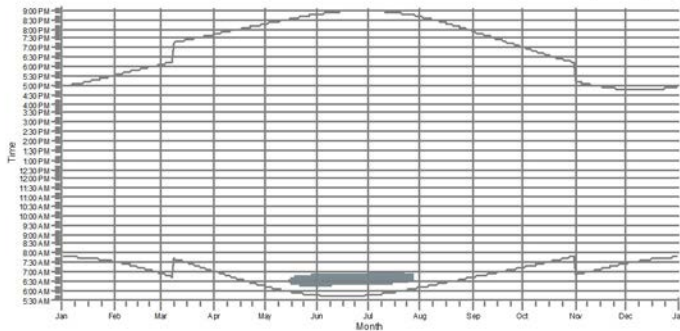
Calculated:

8/31/2015 10:27 AM/2.9.285

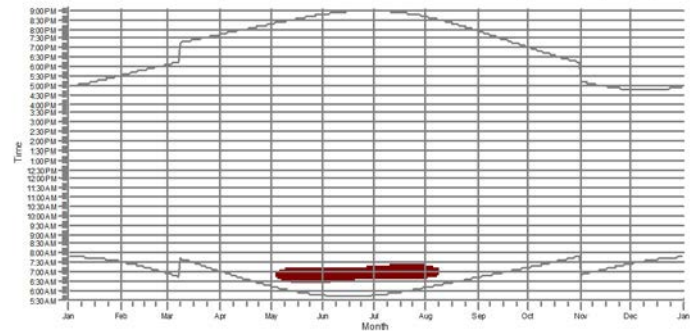
SHADOW - Calendar, graphical

Calculation: 2015-08-31_Arkwright Summit SFA_Vestas V110

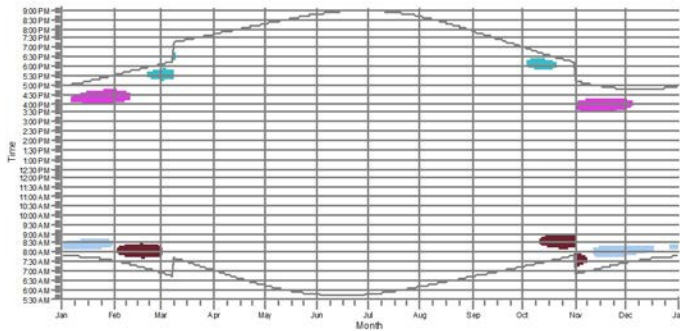
366: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1403)



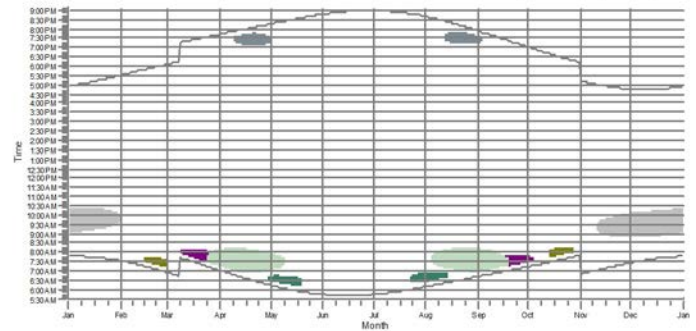
382: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1406)



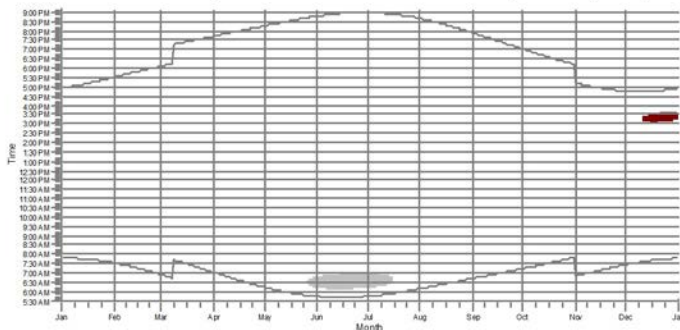
384: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1408)



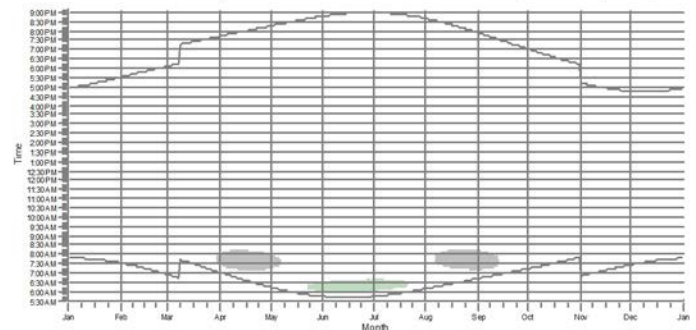
387: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1410)



388: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1411)



389: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1412)



WTGs

22: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (140)
 28: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (126)
 29: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (127)
 30: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (139)

33: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (116)
 36: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (130)
 49: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (150)
 100: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (134)

103: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (148)
 111: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (152)
 115: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (135)

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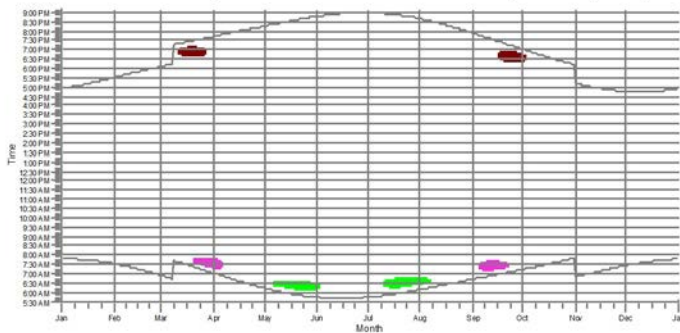
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Calculated:

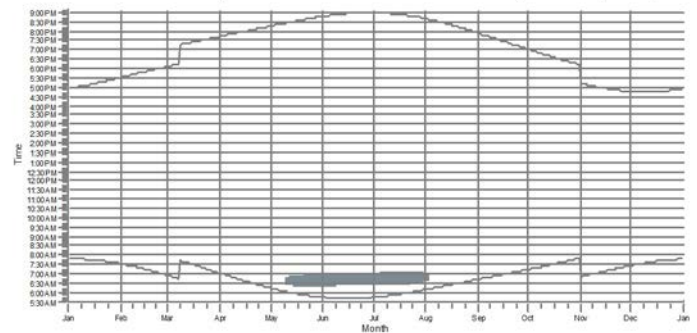
8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar, graphical**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110

391: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1414)



392: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1415)



WTGs

22: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (140)

27: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (125)

102: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (146)

115: VESTAS V110-2.0 2000 110.0 IO! hub: 95.0 m (TOT: 150.0 m) (135)

Project:

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8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 2 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1217)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	January		February		March	April	May	June	July	August	September	October	November	December											
1	07:47		09:17 (22)	07:32	06:54	07:01	06:14	05:43	05:44	06:09	06:42	07:14	06:50		07:26	09:06 (22)									
	16:55	60	10:17 (22)	17:31	18:07	19:43	20:15	20:47	20:59	20:39	19:53	19:00	17:12		16:46	56	10:02 (22)								
2	07:47		09:18 (22)	07:31	06:53	07:00	06:12	05:43	05:44	06:10	06:43	07:15	06:51		07:28		09:06 (22)								
	16:56	60	10:18 (22)	17:32	18:08	19:44	20:16	20:47	20:58	20:38	19:51	18:59	17:10		16:46	56	10:02 (22)								
3	07:47		09:18 (22)	07:30	06:51	06:58	06:11	05:43	05:45	06:11	06:44	07:16	06:53		07:29		09:06 (22)								
	16:57	60	10:18 (22)	17:33	18:09	19:45	20:18	20:48	20:58	20:37	19:49	18:57	17:09		16:45	57	10:03 (22)								
4	07:47		09:19 (22)	07:29	06:49	06:56	06:10	05:42	05:45	06:12	06:45	07:17	06:54		07:30		09:06 (22)								
	16:58	59	10:18 (22)	17:35	18:10	19:46	20:19	20:49	20:58	20:36	19:48	18:55	17:08		16:45	58	10:04 (22)								
5	07:47		09:20 (22)	07:28	06:48	06:54	06:08	05:42	05:46	06:13	06:46	07:18	06:55		07:31		09:06 (22)								
	16:59	59	10:19 (22)	17:36	18:11	19:47	20:20	20:50	20:58	20:34	19:46	18:53	17:07		16:45	58	10:04 (22)								
6	07:47		09:21 (22)	07:27	06:46	06:53	06:07	05:41	05:47	06:14	06:47	07:19	06:56		07:32		09:07 (22)								
	17:00	58	10:19 (22)	17:37	18:13	19:48	20:21	20:50	20:58	20:33	19:44	18:52	17:05		16:45	58	10:05 (22)								
7	07:47		09:21 (22)	07:25	06:44	06:51	06:06	05:41	05:47	06:15	06:48	07:20	06:58		07:33		09:07 (22)								
	17:01	58	10:19 (22)	17:39	18:14	19:49	20:22	20:51	20:57	20:32	19:43	18:50	17:04		16:45	59	10:06 (22)								
8	07:47		09:21 (22)	07:24	07:43	06:49	06:05	05:41	05:48	06:16	06:49	07:22	06:59		07:34		09:07 (22)								
	17:02	58	10:19 (22)	17:40	19:15	19:51	20:23	20:52	20:57	20:31	19:41	18:48	17:03		16:45	59	10:06 (22)								
9	07:47		09:22 (22)	07:23	07:41	06:48	06:03	05:41	05:49	06:17	06:50	07:23	07:00		07:34		09:08 (22)								
	17:03	57	10:19 (22)	17:41	19:16	19:52	20:24	20:52	20:57	20:29	19:39	18:47	17:02		16:45	59	10:07 (22)								
10	07:46		09:23 (22)	07:22	07:39	06:46	06:02	05:40	05:49	06:18	06:51	07:24	07:01		07:35		09:08 (22)								
	17:04	56	10:19 (22)	17:42	19:17	19:53	20:25	20:53	20:56	20:28	19:37	18:45	17:01		16:45	60	10:08 (22)								
11	07:46		09:23 (22)	07:20	07:38	06:44	06:01	05:40	05:50	06:19	06:52	07:25	07:03		07:36		09:07 (22)								
	17:05	56	10:19 (22)	17:44	19:19	19:54	20:26	20:54	20:56	20:27	19:36	18:43	17:00		16:45	60	10:07 (22)								
12	07:46		09:24 (22)	07:19	07:36	06:43	06:00	05:40	05:51	06:21	06:53	07:26	07:04		07:37		09:08 (22)								
	17:06	55	10:19 (22)	17:45	19:20	19:55	20:27	20:54	20:55	20:25	19:34	18:42	16:59		16:45	60	10:08 (22)								
13	07:45		09:26 (22)	07:18	07:34	06:41	05:59	05:40	05:52	06:22	06:54	07:27	07:05		09:25 (22)	07:38	09:08 (22)								
	17:07	53	10:19 (22)	17:46	19:21	19:56	20:28	20:55	20:55	20:24	19:32	18:40	16:58	4	09:29 (22)	16:45	61	10:09 (22)							
14	07:45		09:26 (22)	07:17	07:33	06:39	05:58	05:40	05:52	06:23	06:56	07:28	07:06		09:19 (22)	16:45	61	10:09 (22)							
	17:08	53	10:19 (22)	17:48	19:22	19:57	20:30	20:55	20:54	20:23	19:30	18:38	16:57	17	09:36 (22)	16:45	61	10:10 (22)							
15	07:45		09:27 (22)	07:15	07:31	06:38	05:57	05:40	05:53	06:24	06:57	07:30	07:08		09:17 (22)	16:45	61	10:10 (22)							
	17:09	52	10:19 (22)	17:49	19:23	19:58	20:31	20:56	20:54	20:21	19:29	18:37	16:56	23	09:40 (22)	16:45	60	10:10 (22)							
16	07:44		09:28 (22)	07:14	07:29	06:36	05:56	05:40	05:54	06:25	06:58	07:31	07:09		09:14 (22)	16:45	61	10:09 (22)							
	17:11	50	10:18 (22)	17:50	19:24	20:00	20:32	20:56	20:53	20:20	19:27	18:35	16:55	28	09:42 (22)	16:46	61	10:10 (22)							
17	07:44		09:29 (22)	07:12	07:27	06:35	05:55	05:40	05:55	06:26	06:59	07:32	07:10		09:12 (22)	16:45	61	10:10 (22)							
	17:12	49	10:18 (22)	17:51	19:26	20:00	20:33	20:56	20:52	20:18	19:25	18:33	16:54	32	09:44 (22)	16:46	61	10:11 (22)							
18	07:43		09:30 (22)	07:11	07:26	06:33	05:54	05:40	05:56	06:27	07:00	07:33	07:11		09:12 (22)	16:45	61	10:11 (22)							
	17:13	48	10:18 (22)	17:53	19:27	20:01	20:34	20:57	20:52	20:17	19:23	18:32	16:53	35	09:47 (22)	16:46	61	10:12 (22)							
19	07:43		09:30 (22)	07:09	07:24	06:31	05:53	05:40	05:57	06:28	07:01	07:34	07:12		09:10 (22)	16:45	61	10:12 (22)							
	17:14	47	10:17 (22)	17:54	19:28	20:02	20:35	20:57	20:51	20:15	19:21	18:30	16:53	38	09:48 (22)	16:47	61	10:12 (22)							
20	07:42		09:32 (22)	07:08	07:22	06:30	05:52	05:40	05:58	06:29	07:02	07:35	07:14		09:09 (22)	16:45	61	10:12 (22)							
	17:15	45	10:17 (22)	17:55	19:29	20:03	20:36	20:57	20:50	20:14	19:20	18:29	16:52	41	09:50 (22)	16:47	61	10:13 (22)							
21	07:41		09:33 (22)	07:07	07:20	06:28	05:51	05:40	05:58	06:30	07:03	07:37	07:15		09:08 (22)	16:45	61	10:12 (22)							
	17:17	43	10:16 (22)	17:57	19:30	20:04	20:37	20:58	20:50	20:12	19:18	18:27	16:51	43	09:51 (22)	16:47	61	10:13 (22)							
22	07:41		09:34 (22)	07:05	07:19	06:27	05:50	05:41	05:59	06:31	07:04	07:38	07:16		09:08 (22)	16:45	61	10:13 (22)							
	17:18	41	10:15 (22)	17:58	19:31	20:05	20:38	20:58	20:49	20:11	19:16	18:26	16:51	45	09:53 (22)	16:48	61	10:14 (22)							
23	07:40		09:35 (22)	07:04	07:17	06:25	05:49	05:41	06:00	06:32	07:05	07:39	07:17		09:07 (22)	16:45	61	10:13 (22)							
	17:19	38	10:13 (22)	17:59	19:32	20:06	20:39	20:58	20:48	20:09	19:14	18:24	16:50	47	09:54 (22)	16:48	61	10:14 (22)							
24	07:39		09:38 (22)	07:02	07:15	06:24	05:49	05:41	06:01	06:33	07:06	07:40	07:18		09:07 (22)	16:45	61	10:13 (22)							
	17:20	35	10:13 (22)	18:00	19:34	20:07	20:40	20:58	20:47	20:08	19:13	18:23	16:49	48	09:55 (22)	16:49	61	10:14 (22)							
25	07:38		09:39 (22)	07:00	07:13	06:22	05:48	05:41	06:02	06:34	07:07	07:41	07:20		09:06 (22)	16:45	61	10:14 (22)							
	17:22	32	10:11 (22)	18:02	19:35	20:09	20:41	20:58	20:46	20:06	19:11	18:21	16:49	49	09:55 (22)	16:50	61	10:15 (22)							
26	07:38		09:41 (22)	06:59	07:12	06:21	05:47	05:42	06:03	06:35	07:08	07:43	07:21		09:07 (22)	16:45	61	10:15 (22)							
	17:23	28	10:09 (22)	18:03	19:36	20:10	20:41	20:59	20:45	20:04	19:09	18:20	16:48	50	09:57 (22)	16:50	61	10:15 (22)							
27	07:37		09:44 (22)	06:57	07:10	06:19	05:46	05:42	06:04	06:36	07:09	07:44	07:22		09:06 (22)	16:46	61	10:15 (22)							
	17:24	23	10:07 (22)	18:04	19:37	20:11	20:42	20:59	20:44	20:03	19:07	18:18	16:48	52	09:58 (22)	16:51	61	10:15 (22)							
28	07:36		09:47 (22)	06:56	07:08	06:18	05:46	05:42	06:05	06:38	07:10	07:45	07:23		09:06 (22)	16:46	61	10:16 (22)							
	17:25	16	10:03 (22)	18:05	19:38	20:12	20:43	20:59	20:43	20:01	19:06	18:17	16:47	53	09:59 (22)	16:52	60	10:16 (22)							
29	07:35				07:06	06:16	05:45	05:43	06:06	06:39	07:12	07:46	07:24		09:06 (22)	16:46	61	10:16 (22)							
	17:27				19:39	20:13	20:44	20:59	20:42	19:58	19:04	18:16	16:47	53	09:59 (22)	16:52	61	10:17 (22)							
30	07:34				07:05	06:15	05:45	05:43	06:07	06:40	07:13	07:48	07:25		09:05 (22)	16:47	61	10:17 (22)							
	17:28				19:40	20:14	20:45	20:59	20:41	19:56	19:02	18:14	16:46	55	10:00 (22)	16:53	61	10:17 (22)							
31	07:33				07:03		0																		
	17:29				19:41		20:46		20:40	19:54		18:13			16:54	60	10:17 (22)								
Potential sun hours	294		295		370		401		452		457		463		431		375		433		294		713		1856
Total, worst case		1349																					0.29		0.27
Sun reduction		0.31																					1.00		1.00
Oper. time red.		1.00																					0.58		0.58
Wind dir. red.		0.58																					0.17		0.16
Total reduction		0.18																					0.19		0.16
Total, real		241																					119		289

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 3

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 37 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1248)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

July		August		September		October		November		December	
1	05:44	06:09		06:42	07:35 (110)	07:14		06:50	07:48 (69)	07:27	08:50 (50)
	20:59	20:39		19:53	08:19 (110)	19:00		17:12	08:23 (69)	16:46	09:15 (50)
2	05:44	06:10		06:43	07:35 (110)	07:15		06:51	07:48 (69)	07:28	08:50 (50)
	20:59	20:38		19:51	08:18 (110)	18:59		17:10	08:22 (69)	16:46	09:16 (50)
3	05:45	06:11		06:44	07:35 (110)	07:16		06:53	07:49 (69)	07:29	08:50 (50)
	20:58	20:37		19:50	08:18 (110)	18:57		17:09	08:22 (69)	16:45	09:17 (50)
4	05:45	06:12		06:45	07:34 (110)	07:17		06:54	07:49 (69)	07:30	08:50 (50)
	20:58	20:36		19:48	08:18 (110)	18:55		17:08	08:21 (69)	16:45	09:17 (50)
5	05:46	06:13		06:46	07:34 (110)	07:18		06:55	07:50 (69)	07:31	08:50 (50)
	20:58	20:35		19:46	08:17 (110)	18:53		17:07	08:20 (69)	16:45	09:18 (50)
6	05:47	06:14		06:47	07:34 (110)	07:19		06:56	07:51 (69)	07:32	08:51 (50)
	20:58	20:33		19:44	08:16 (110)	18:52		17:06	08:20 (69)	16:45	09:18 (50)
7	05:47	06:15		06:48	07:35 (110)	07:21		06:58	07:52 (69)	07:33	08:51 (50)
	20:57	20:32		19:43	08:16 (110)	18:50		17:04	08:19 (69)	16:45	09:19 (50)
8	05:48	06:16		06:49	07:35 (110)	07:22		06:59	07:53 (69)	07:34	08:51 (50)
	20:57	20:31		19:41	08:15 (110)	18:48		17:03	08:18 (69)	16:45	09:20 (50)
9	05:49	06:17		06:50	07:35 (110)	07:23		07:00	07:55 (69)	07:35	08:52 (50)
	20:57	20:30		19:39	08:14 (110)	18:47		17:02	08:17 (69)	16:45	09:20 (50)
10	05:49	06:18		06:51	07:36 (110)	07:24		07:01	07:56 (69)	07:35	08:52 (50)
	20:56	20:28		19:37	08:12 (110)	18:45		17:01	08:15 (69)	16:45	09:21 (50)
11	05:50	06:20		06:52	07:36 (110)	07:25		07:03	07:58 (69)	07:36	08:53 (50)
	20:56	20:27		19:36	08:11 (110)	18:43		17:00	08:13 (69)	16:45	09:22 (50)
12	05:51	06:21		06:53	07:37 (110)	07:26		07:04	08:02 (69)	07:37	08:52 (50)
	20:56	20:25		19:34	08:09 (110)	18:42		16:59	08:11 (69)	16:45	09:21 (50)
13	05:52	06:22		06:55	07:39 (110)	07:27		07:05		07:38	08:53 (50)
	20:55	20:24		19:32	08:07 (110)	18:40		16:58		16:45	09:22 (50)
14	05:52	06:23		06:56	07:40 (110)	07:28		07:06		07:39	08:53 (50)
	20:54	20:23		19:30	08:05 (110)	18:38		16:57		16:45	09:23 (50)
15	05:53	06:24		06:57	07:42 (110)	07:30		07:08		07:40	08:54 (50)
	20:54	20:21		19:29	08:02 (110)	18:37		16:56		16:45	09:23 (50)
16	05:54	06:25		06:58	07:46 (110)	07:31		07:09		07:40	08:54 (50)
	20:53	20:20		19:27	07:57 (110)	18:35		16:55		16:46	09:23 (50)
17	05:55	06:26		06:59				07:10		07:41	08:55 (50)
	20:53	20:18		19:25		18:34		16:54		16:46	09:24 (50)
18	05:56	06:27	07:55 (110)	07:00		07:33	09:00 (69)	07:11		07:42	08:55 (50)
	20:52	20:17	08:05 (110)	19:23		18:32	09:12 (69)	16:54		16:46	09:25 (50)
19	05:57	06:28	07:51 (110)	07:01		07:34	08:56 (69)	07:13		07:42	08:55 (50)
	20:51	20:15	08:09 (110)	19:22		18:30	09:15 (69)	16:53		16:47	09:25 (50)
20	05:58	06:29	07:49 (110)	07:02		07:36	08:54 (69)	07:14		07:43	08:56 (50)
	20:51	20:14	08:11 (110)	19:20		18:29	09:17 (69)	16:52		16:47	09:26 (50)
21	05:58	06:30	07:47 (110)	07:03		07:37	08:53 (69)	07:15		07:43	08:56 (50)
	20:50	20:12	08:13 (110)	19:18		18:27	09:19 (69)	16:51		16:47	09:26 (50)
22	05:59	06:31	07:45 (110)	07:04		07:38	08:52 (69)	07:16		07:44	08:57 (50)
	20:49	20:11	08:14 (110)	19:16		18:26	09:20 (69)	16:51		16:48	09:27 (50)
23	06:00	06:32	07:43 (110)	07:05		07:39	08:50 (69)	07:17	08:55 (50)	07:44	08:57 (50)
	20:48	20:09	08:15 (110)	19:14		18:24	09:20 (69)	16:50	09:04 (50)	16:48	09:27 (50)
24	06:01	06:33	07:42 (110)	07:06		07:40	08:50 (69)	07:19	08:53 (50)	07:45	08:58 (50)
	20:47	20:08	08:16 (110)	19:13		18:23	09:22 (69)	16:49	09:06 (50)	16:49	09:28 (50)
25	06:02	06:34	07:41 (110)	07:07		07:42	08:49 (69)	07:20	08:53 (50)	07:45	08:58 (50)
	20:46	20:06	08:17 (110)	19:11		18:21	09:22 (69)	16:49	09:09 (50)	16:50	09:28 (50)
26	06:03	06:35	07:40 (110)	07:08		07:43	08:48 (69)	07:21	08:52 (50)	07:46	08:59 (50)
	20:45	20:04	08:18 (110)	19:09		18:20	09:22 (69)	16:48	09:10 (50)	16:50	09:28 (50)
27	06:04	06:37	07:39 (110)	07:09		07:44	08:48 (69)	07:22	08:51 (50)	07:46	09:00 (50)
	20:44	20:03	08:18 (110)	19:07		18:19	09:22 (69)	16:48	09:11 (50)	16:51	09:29 (50)
28	06:05	06:38	07:38 (110)	07:11		07:45	08:48 (69)	07:23	08:50 (50)	07:46	09:00 (50)
	20:43	20:01	08:18 (110)	19:06		18:17	09:23 (69)	16:47	09:12 (50)	16:52	09:29 (50)
29	06:06	06:39	07:37 (110)	07:12		07:46	08:48 (69)	07:24	08:50 (50)	07:47	09:00 (50)
	20:42	20:00	08:19 (110)	19:04		18:16	09:23 (69)	16:47	09:13 (50)	16:52	09:29 (50)
30	06:07	06:40	07:36 (110)	07:13		07:48	08:47 (69)	07:26	08:51 (50)	07:47	09:01 (50)
	20:41	19:56	08:19 (110)	19:02		18:14	09:23 (69)	16:46	09:15 (50)	16:53	09:30 (50)
31	06:08	06:41	07:36 (110)			07:49	08:48 (69)			07:47	09:01 (50)
	20:40	19:55	08:19 (110)			18:13	09:23 (69)			16:54	09:30 (50)
Potential sun hours	464	431		375		343		294		283	
Total, worst case		452		566		412		455		892	
Sun reduction		0.64		0.57		0.50		0.29		0.27	
Oper. time red.		1.00		1.00		1.00		1.00		1.00	
Wind dir. red.		0.62		0.62		0.57		0.58		0.58	
Total reduction		0.39		0.35		0.29		0.17		0.16	
Total, real		178		198		117		75		139	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 4

Licensed user:

EDR

217 Montgomery St.

US-SYRACUSE, NY 13202

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Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 39 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1250)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

January		February		March		April		May		June	
1	07:47	09:01 (110)	07:32	08:46 (110)	06:54	07:42 (49)	07:01	06:14	05:43		
	16:55	10	09:11 (110)	17:31	61	09:47 (110)	18:07	19:43	20:15	20:47	
2	07:47	08:59 (110)	07:31	08:46 (110)	06:53	07:43 (49)	07:00	06:12	05:43		
	16:56	14	09:13 (110)	17:32	61	09:47 (110)	18:08	19:44	20:17	20:48	
3	07:47	08:58 (110)	07:30	08:46 (110)	06:51	07:44 (49)	06:58	06:11	05:42		
	16:57	17	09:15 (110)	17:33	61	09:47 (110)	18:09	19:45	20:18	20:48	
4	07:47	08:57 (110)	07:29	08:46 (110)	06:49	07:45 (49)	06:56	06:10	05:42		
	16:58	20	09:17 (110)	17:35	62	09:48 (110)	18:10	19:46	20:19	20:49	
5	07:47	08:57 (110)	07:28	08:46 (110)	06:48	07:47 (49)	06:54	06:08	05:42		
	16:59	22	09:19 (110)	17:36	62	09:48 (110)	18:11	19:47	20:20	20:50	
6	07:47	08:56 (110)	07:27	08:46 (110)	06:46	07:59 (49)	06:53	06:07	05:41		
	17:00	25	09:21 (110)	17:37	61	09:47 (110)	18:13	19:48	20:21	20:51	
7	07:47	08:56 (110)	07:26	08:46 (110)	06:44		06:51	06:06	05:41		
	17:01	27	09:23 (110)	17:39	61	09:47 (110)	18:14	19:50	20:22	20:51	
8	07:47	08:55 (110)	07:24	08:47 (110)	07:43		06:49	06:05	05:41		
	17:02	29	09:24 (110)	17:40	60	09:47 (110)	19:15	19:51	20:23	20:52	
9	07:47	08:54 (110)	07:23	08:47 (110)	07:41		06:48	06:03	05:41		
	17:03	31	09:25 (110)	17:41	60	09:47 (110)	19:16	19:52	20:24	20:53	
10	07:47	08:53 (110)	07:22	08:47 (110)	07:39		06:46	06:02	05:40		
	17:04	34	09:27 (110)	17:42	59	09:46 (110)	19:17	19:53	20:25	20:53	
11	07:46	08:53 (110)	07:21	08:47 (110)	07:38		06:44	06:01	05:40		
	17:05	36	09:29 (110)	17:44	59	09:46 (110)	19:19	19:54	20:26	20:54	
12	07:46	08:52 (110)	07:19	08:48 (110)	07:36		06:43	06:00	05:40		
	17:06	37	09:29 (110)	17:45	58	09:46 (110)	19:20	19:55	20:28	20:54	
13	07:46	08:52 (110)	07:18	08:48 (110)	07:34		06:41	05:59	05:40		
	17:07	39	09:31 (110)	17:46	57	09:45 (110)	19:21	19:56	20:29	20:55	
14	07:45	08:51 (110)	07:17	08:49 (110)	07:33		06:39	05:58	05:40		
	17:08	41	09:32 (110)	17:48	56	09:45 (110)	19:22	19:57	20:30	20:55	
15	07:45	08:51 (110)	07:15	08:49 (110)	07:31		06:38	05:57	05:40		
	17:09	42	09:33 (110)	17:49	54	09:43 (110)	19:23	19:59	20:31	20:56	
16	07:44	08:50 (110)	07:14	08:50 (110)	07:29		06:36	05:56	05:40		
	17:11	44	09:34 (110)	17:50	53	09:43 (110)	19:24	20:00	20:32	20:56	
17	07:44	08:50 (110)	07:12	07:52 (49)	07:27		06:35	05:55	05:40		
	17:12	46	09:36 (110)	17:52	59	09:42 (110)	19:26	20:00	20:33	20:57	
18	07:43	08:49 (110)	07:11	07:48 (49)	07:26		06:33	05:54	05:40		
	17:13	48	09:37 (110)	17:53	64	09:40 (110)	19:27	20:01	20:34	20:57	
19	07:43	08:48 (110)	07:10	07:47 (49)	07:24		06:31	05:53	05:40		
	17:14	49	09:37 (110)	17:54	64	09:39 (110)	19:28	20:02	20:35	20:57	
20	07:42	08:49 (110)	07:08	07:45 (49)	07:22		06:30	05:52	05:40		
	17:15	50	09:39 (110)	17:55	65	09:37 (110)	19:29	20:03	20:36	20:58	
21	07:41	08:48 (110)	07:07	07:44 (49)	07:20		06:28	05:51	05:40		
	17:17	52	09:40 (110)	17:57	64	09:36 (110)	19:30	20:04	20:37	20:58	
22	07:41	08:47 (110)	07:05	07:43 (49)	07:19		06:27	05:50	05:41		
	17:18	53	09:40 (110)	17:58	62	09:34 (110)	19:31	20:05	20:38	20:58	
23	07:40	08:48 (110)	07:04	07:43 (49)	07:17		06:25	05:49	05:41		
	17:19	54	09:42 (110)	17:59	59	09:32 (110)	19:32	20:06	20:39	20:58	
24	07:39	08:47 (110)	07:02	07:42 (49)	07:15		06:24	05:49	05:41		
	17:20	55	09:42 (110)	18:00	55	09:29 (110)	19:34	20:08	20:40	20:58	
25	07:39	08:47 (110)	07:01	07:42 (49)	07:14		06:22	05:48	05:41		
	17:22	56	09:43 (110)	18:02	49	09:26 (110)	19:35	20:09	20:41	20:59	
26	07:38	08:47 (110)	06:59	07:42 (49)	07:12		06:21	05:47	05:42		
	17:23	57	09:44 (110)	18:03	39	09:20 (110)	19:36	20:10	20:42	20:59	
27	07:37	08:46 (110)	06:57	07:41 (49)	07:10		06:19	05:46	05:42		
	17:24	58	09:44 (110)	18:04	26	08:07 (49)	19:37	20:11	20:42	20:59	
28	07:36	08:46 (110)	06:56	07:42 (49)	07:08		06:18	05:46	05:42		
	17:25	59	09:45 (110)	18:05	25	08:07 (49)	19:38	20:12	20:43	20:59	
29	07:35	08:46 (110)			07:07		06:16	05:45	05:43		
	17:27	59	09:45 (110)		19:39		20:13	20:44	20:59		
30	07:34	08:46 (110)			07:05		06:15	05:45	05:43		
	17:28	60	09:46 (110)		19:40		20:14	20:45	20:59		
31	07:33	08:46 (110)			07:03			05:44			
	17:29	60	09:46 (110)		19:42			20:46			
Potential sun hours	294		295		370		401	452	457		
Total, worst case		1284		1576		94					
Sun reduction		0.31		0.38		0.46					
Oper. time red.		1.00		1.00		1.00					
Wind dir. red.		0.58		0.58		0.59					
Total reduction		0.18		0.22		0.27					
Total, real		230		347		25					

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 5

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 39 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1250)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	05:44	06:09	06:42	07:14	06:50	08:16 (110) 07:27
2	05:44	06:10	06:43	07:15	06:51	08:16 (110) 07:28
3	05:45	06:11	06:44	07:16	06:53	08:16 (110) 07:29
4	05:45	06:12	06:45	07:17	06:54	08:16 (110) 07:30
5	05:46	06:13	06:46	07:18	06:55	08:16 (110) 07:31
6	05:47	06:14	06:47	07:19	06:56	08:16 (110) 07:32
7	05:47	06:15	06:48	07:20	06:58	08:16 (110) 07:33
8	05:48	06:16	06:49	07:22	06:59	08:16 (110) 07:34
9	05:49	06:17	06:50	07:23	07:00	08:17 (110) 07:35
10	05:49	06:18	06:51	07:24	07:01	08:17 (110) 07:35
11	05:50	06:19	06:52	07:25	07:03	08:17 (110) 07:36
12	05:51	06:21	06:53	07:26	07:04	08:18 (110) 07:37
13	05:52	06:22	06:55	07:27	07:05	08:18 (110) 07:38
14	05:52	06:23	06:56	07:28	07:06	08:18 (110) 07:39
15	05:53	06:24	06:57	07:30	07:08	08:19 (110) 07:40
16	05:54	06:25	06:58	07:31	07:09	08:20 (110) 07:40
17	05:55	06:26	06:59	07:32	07:10	08:20 (110) 07:41
18	05:56	06:27	07:00	07:33	07:11	08:21 (110) 07:42
19	05:57	06:28	07:01	07:34	07:13	08:22 (110) 07:42
20	05:58	06:30	07:03	07:37	07:15	08:24 (110) 07:43
21	05:59	06:31	07:04	07:38	07:16	08:25 (110) 07:44
22	06:00	06:32	07:05	07:39	07:17	08:26 (110) 07:45
23	06:01	06:33	07:06	07:40	07:19	08:28 (110) 07:46
24	06:02	06:34	07:07	07:42	07:20	08:29 (110) 07:46
25	06:03	06:35	07:08	07:43	07:21	08:29 (110) 07:46
26	06:04	06:36	07:09	07:44	07:22	08:30 (110) 07:46
27	06:05	06:37	07:10	07:45	07:23	08:31 (110) 07:46
28	06:06	06:38	07:11	07:46	07:24	08:32 (110) 07:47
29	06:07	06:39	07:12	07:47	07:25	08:33 (110) 07:47
30	06:08	06:40	07:13	07:48	07:26	08:34 (110) 07:47
31	06:09	06:41	07:14	07:49	07:27	08:35 (110) 07:47
Potential sun hours	464	431	375	343	294	283
Total, worst case						
Sun reduction				1086	1630	272
Oper. time red.				0.50	0.29	0.27
Wind dir. red.				1.00	1.00	1.00
Total reduction				0.58	0.58	0.58
Total, real				0.29	0.17	0.16
				315	273	42

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 6

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Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 41 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1252)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	January		February		March		April		May		June		July		August		September		October		November		December	
1	07:47	10:32 (110)	07:32	08:15 (49)	06:54	07:01	06:14	05:43	05:44	06:09	06:42	07:14	06:50	07:12	30	07:43 (49)	07:27	10:25 (110)	07:12	30	08:13 (49)	16:46	43	11:08 (110)
2	07:47	10:33 (110)	07:31	08:14 (49)	06:53	07:00	06:12	05:43	05:44	06:10	06:43	07:15	06:51	07:42 (49)	07:28	10:24 (110)	06:51	07:42 (49)	07:28	10:24 (110)	06:51	07:42 (49)	07:28	10:24 (110)
3	07:47	10:33 (110)	07:30	08:14 (49)	06:51	06:58	06:11	05:42	05:45	06:11	06:44	07:16	06:53	07:43 (49)	07:29	10:23 (110)	06:53	07:43 (49)	07:29	10:23 (110)	06:53	07:43 (49)	07:29	10:23 (110)
4	07:47	10:34 (110)	07:29	08:14 (49)	06:49	06:56	06:10	05:42	05:45	06:12	06:45	07:17	06:54	07:42 (49)	07:30	10:23 (110)	06:54	07:42 (49)	07:30	10:23 (110)	06:54	07:42 (49)	07:30	10:23 (110)
5	07:47	10:35 (110)	07:28	08:13 (49)	06:48	06:54	06:08	05:42	05:46	06:13	06:46	07:18	06:55	07:42 (49)	07:31	10:23 (110)	06:55	07:42 (49)	07:31	10:23 (110)	06:55	07:42 (49)	07:31	10:23 (110)
6	07:47	10:36 (110)	07:27	08:12 (49)	06:46	06:53	06:07	05:41	05:47	06:14	06:47	07:19	06:56	07:43 (49)	07:32	10:23 (110)	06:56	07:43 (49)	07:32	10:23 (110)	06:56	07:43 (49)	07:32	10:23 (110)
7	07:47	10:38 (110)	07:26	08:13 (49)	06:44	06:51	06:06	05:41	05:47	06:15	06:48	07:20	06:58	07:43 (49)	07:33	10:22 (110)	06:58	07:43 (49)	07:33	10:22 (110)	06:58	07:43 (49)	07:33	10:22 (110)
8	07:47	10:39 (110)	07:24	08:13 (49)	07:43	06:49	06:05	05:41	05:48	06:16	06:49	07:22	06:59	07:44 (49)	07:34	10:22 (110)	06:59	07:44 (49)	07:34	10:22 (110)	06:59	07:44 (49)	07:34	10:22 (110)
9	07:47	10:39 (110)	07:23	08:13 (49)	07:41	06:48	06:03	05:41	05:49	06:17	06:50	07:23	07:00	07:45 (49)	07:35	10:23 (110)	07:00	07:45 (49)	07:35	10:23 (110)	07:00	07:45 (49)	07:35	10:23 (110)
10	07:47	10:41 (110)	07:22	08:13 (49)	07:39	06:46	06:02	05:40	05:49	06:18	06:51	07:24	07:01	07:46 (49)	07:36	10:23 (110)	07:01	07:46 (49)	07:36	10:23 (110)	07:01	07:46 (49)	07:36	10:23 (110)
11	07:46	10:42 (110)	07:21	08:13 (49)	07:38	06:44	06:01	05:40	05:50	06:19	06:52	07:25	07:03	07:46 (49)	07:36	10:23 (110)	07:03	07:46 (49)	07:36	10:23 (110)	07:03	07:46 (49)	07:36	10:23 (110)
12	07:46	10:43 (110)	07:19	08:14 (49)	07:36	06:43	06:00	05:40	05:51	06:21	06:53	07:26	07:04	07:48 (49)	07:37	10:22 (110)	07:04	07:48 (49)	07:37	10:22 (110)	07:04	07:48 (49)	07:37	10:22 (110)
13	07:46	10:45 (110)	07:18	08:14 (49)	07:34	06:41	05:59	05:40	05:52	06:22	06:54	07:27	07:05	07:49 (49)	07:38	10:23 (110)	07:05	07:49 (49)	07:38	10:23 (110)	07:05	07:49 (49)	07:38	10:23 (110)
14	07:45	10:46 (110)	07:17	08:15 (49)	07:33	06:39	05:58	05:40	05:52	06:23	06:56	07:28	07:06	07:51 (49)	07:39	10:23 (110)	07:06	07:51 (49)	07:39	10:23 (110)	07:06	07:51 (49)	07:39	10:23 (110)
15	07:45	10:49 (110)	07:15	08:16 (49)	07:31	06:38	05:57	05:40	05:53	06:24	06:57	07:30	07:08	07:54 (49)	07:40	10:24 (110)	07:08	07:54 (49)	07:40	10:24 (110)	07:08	07:54 (49)	07:40	10:24 (110)
16	07:44	10:50 (110)	07:14	08:17 (49)	07:29	06:36	05:56	05:40	05:54	06:25	06:58	07:31	07:09	07:58 (49)	07:40	10:23 (110)	07:09	07:58 (49)	07:40	10:23 (110)	07:09	07:58 (49)	07:40	10:23 (110)
17	07:44	10:51 (110)	07:12	08:19 (49)	07:27	06:35	05:55	05:40	05:55	06:26	06:59	07:32	07:10	08:00 (49)	07:41	10:24 (110)	07:10	08:00 (49)	07:41	10:24 (110)	07:10	08:00 (49)	07:41	10:24 (110)
18	07:43	10:52 (110)	07:11	08:21 (49)	07:26	06:33	05:54	05:40	05:56	06:27	07:00	07:33	07:11	08:01 (49)	07:42	10:25 (110)	07:11	08:01 (49)	07:42	10:25 (110)	07:11	08:01 (49)	07:42	10:25 (110)
19	07:43	11:04 (110)	07:10	08:26 (49)	07:24	06:31	05:53	05:40	05:57	06:28	07:01	07:34	07:13	08:05 (49)	07:43	10:26 (110)	07:13	08:05 (49)	07:43	10:26 (110)	07:13	08:05 (49)	07:43	10:26 (110)
20	07:42	11:06 (110)	07:08	08:30 (49)	07:28	06:30	05:52	05:40	05:57	06:29	07:02	07:35	07:14	08:06 (49)	07:44	10:27 (110)	07:14	08:06 (49)	07:44	10:27 (110)	07:14	08:06 (49)	07:44	10:27 (110)
21	07:41	11:07 (110)	07:07	08:31 (49)	07:27	06:29	05:51	05:40	05:58	06:30	07:03	07:37	07:15	08:07 (49)	07:45	10:28 (110)	07:15	08:07 (49)	07:45	10:28 (110)	07:15	08:07 (49)	07:45	10:28 (110)
22	07:41	11:08 (110)	07:06	08:32 (49)	07:26	06:28	05:50	05:41	05:59	06:31	07:04	07:38	07:16	08:08 (49)	07:46	10:29 (110)	07:16	08:08 (49)	07:46	10:29 (110)	07:16	08:08 (49)	07:46	10:29 (110)
23	07:40	11:09 (110)	07:05	08:33 (49)	07:25	06:27	05:49	05:41	05:58	06:32	07:05	07:39	07:17	08:09 (49)	07:47	10:30 (110)	07:17	08:09 (49)	07:47	10:30 (110)	07:17	08:09 (49)	07:47	10:30 (110)
24	07:39	11:10 (110)	07:04	08:34 (49)	07:24	06:26	05:48	05:40	05:57	06:33	07:06	07:40	07:18	08:10 (49)	07:48	10:31 (110)	07:18	08:10 (49)	07:48	10:31 (110)	07:18	08:10 (49)	07:48	10:31 (110)
25	07:39	11:11 (110)	07:03	08:35 (49)	07:23	06:25	05:47	05:41	05:56	06:34	07:07	07:42	07:19	08:11 (49)	07:49	10:32 (110)	07:19	08:11 (49)	07:49	10:32 (110)	07:19	08:11 (49)	07:49	10:32 (110)
26	07:38	11:12 (110)	07:02	08:36 (49)	07:22	06:24	05:46	05:40	05:55	06:35	07:08	07:43	07:20	08:12 (49)	07:50	10:33 (110)	07:20	08:12 (49)	07:50	10:33 (110)	07:20	08:12 (49)	07:50	10:33 (110)
27	07:37	11:13 (110)	07:01	08:37 (49)	07:21	06:23	05:45	05:40	05:54	06:36	07:09	07:44	07:21	08:13 (49)	07:51	10:34 (110)	07:21	08:13 (49)	07:51	10:34 (110)	07:21	08:13 (49)	07:51	10:34 (110)
28	07:36	11:14 (110)	07:00	08:38 (49)	07:20	06:22	05:44	05:40	05:53	06:37	07:10	07:45	07:22	08:14 (49)	07:52	10:35 (110)	07:22	08:14 (49)	07:52	10:35 (110)	07:22	08:14 (49)	07:52	10:35 (110)
29	07:35	11:15 (110)	06:59	08:39 (49)	07:19	06:21	05:43	05:40	05:52	06:38	07:11	07:46	07:23	08:15 (49)	07:53	10:36 (110)	07:23	08:15 (49)	07:53	10:36 (110)	07:23	08:15 (49)	07:53	10:36 (110)
30	07:34	11:16 (110)	06:58	08:40 (49)	07:18	06:20	05:42	05:40	05:51	06:39	07:12	07:46	07:24	08:16 (49)	07:54	10:37 (110)	07:24	08:16 (49)	07:54	10:37 (110)	07:24	08:16 (49)	07:54	10:37 (110)
31	07:33	11:17 (110)	06:57	08:41 (49)	07:17	06:19	05:41	05:40	05:50	06:40	07:13	07:48	07:25	08:17 (49)	07:55	10:38 (110)	07:25	08:17 (49)	07:55	10:38 (110)	07:25	08:17 (49)	07:55	10:38 (110)
Potential sun hours	294	295	370	401	452	457	464	431	375	343	294	283	1733	0.27	0.29	0.31	0.33	0.35	0.37	0.39	0.41	0.43	0.45	0.47
Total, worst case	879	490	0.38	1.00	0.58	0.22	0.19	0.16	0.14	0.12	0.10	0.08	0.06	0.05	0.04	0.03	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Oper. time red.	1.00	1.00	0.58	0.22	0.19	0.16	0.14	0.12	0.10	0.08	0.06	0.05	0.04	0.03	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Wind dir. red.	0.60	0.58	0.56	0.54	0.52	0.50	0.48	0.46	0.44	0.42	0.40	0.38	0.36	0.34	0.32	0.30	0.28	0.26	0.24	0.22	0.20	0.18	0.16	0.14
Total reduction	0.19	0.22	0.24	0.26	0.28	0.30	0.32	0.34	0.36	0.38	0.40	0.42	0.44	0.46	0.48	0.50	0.52	0.54	0.56	0.58	0.60	0.62	0.64	0.66
Total, real	165	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 7

Licensed user:

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Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 43 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1254)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117		541	386	285 8,759

Idle start wind speed: Cut in wind speed from power curve

		[January	[February	[March	[April	[May	[June	[July	[August	[September	[October	[November		[December										
1	07:47	08:36 (111)	07:32	06:54	07:01	06:14	05:43	05:44	06:09	06:42	07:14	06:50		07:27	08:22 (111)									
	16:55	73	14:10 (110)	17:31	18:07	19:43	20:15	20:47	20:59	20:39	19:53	19:00	17:12	16:46	59	09:21 (49)								
2	07:47	08:37 (111)	07:31	06:53	07:00	06:12	05:43	05:44	06:10	06:43	07:15	06:51		07:28	08:22 (111)									
	16:56	68	14:08 (110)	17:32	18:08	19:44	20:17	20:48	20:59	20:38	19:51	18:59	17:10	16:46	59	09:21 (49)								
3	07:47	08:37 (111)	07:30	06:51	06:58	06:11	05:42	05:45	06:11	06:44	07:16	06:53		07:29	08:23 (111)									
	16:57	58	09:35 (49)	17:33	18:09	19:45	20:18	20:48	20:58	20:37	19:50	18:57	17:09	16:45	59	09:22 (49)								
4	07:47	08:37 (111)	07:29	06:49	06:56	06:10	05:42	05:45	06:12	06:45	07:17	06:54		07:30	08:23 (111)									
	16:58	59	09:36 (49)	17:35	18:10	19:46	20:19	20:49	20:58	20:36	19:48	18:55	17:08	16:45	59	09:22 (49)								
5	07:47	08:38 (111)	07:28	06:48	06:54	06:08	05:42	05:46	06:13	06:46	07:18	06:55		07:31	08:23 (111)									
	16:59	58	09:36 (49)	17:36	18:11	19:47	20:20	20:50	20:58	20:35	19:46	18:53	17:07	16:45	59	09:22 (49)								
6	07:47	08:38 (111)	07:27	06:46	06:53	06:07	05:41	05:47	06:14	06:47	07:19	06:56		07:32	08:24 (111)									
	17:00	59	09:37 (49)	17:37	18:13	19:48	20:21	20:51	20:58	20:33	19:44	18:52	17:05	16:45	59	09:23 (49)								
7	07:47	08:38 (111)	07:26	06:44	06:51	06:06	05:41	05:47	06:15	06:48	07:20	06:58		07:33	08:25 (111)									
	17:01	59	09:37 (49)	17:39	18:14	19:49	20:22	20:51	20:57	20:32	19:43	18:50	17:04	16:45	58	09:23 (49)								
8	07:47	08:39 (111)	07:24	07:43	06:49	06:05	05:41	05:48	06:16	06:49	07:22	06:59		07:34	08:25 (111)									
	17:02	59	09:38 (49)	17:40	19:15	19:51	20:23	20:52	20:57	20:31	19:41	18:48	17:03	16:45	59	09:24 (49)								
9	07:47	08:39 (111)	07:23	07:41	06:48	06:03	05:40	05:49	06:17	06:50	07:23	07:00		07:35	08:26 (111)									
	17:03	59	09:38 (49)	17:41	19:16	19:52	20:24	20:52	20:57	20:29	19:39	18:47	17:02	16:45	58	09:24 (49)								
10	07:47	08:39 (111)	07:22	07:39	06:46	06:02	05:40	05:49	06:18	06:51	07:24	07:01		07:35	08:27 (111)									
	17:04	59	09:38 (49)	17:42	19:17	19:53	20:25	20:53	20:56	20:28	19:37	18:45	17:01	16:45	68	13:58 (110)								
11	07:46	08:40 (111)	07:21	07:38	06:44	06:01	05:40	05:50	06:19	06:52	07:25	07:03		07:36	08:27 (111)									
	17:05	59	09:39 (49)	17:44	19:19	19:54	20:26	20:54	20:56	20:27	19:36	18:43	17:00	16:45	72	14:01 (110)								
12	07:46	08:40 (111)	07:19	07:36	06:43	06:00	05:40	05:51	06:21	06:53	07:26	07:04		07:37	08:27 (111)									
	17:06	58	09:38 (49)	17:45	19:20	19:55	20:28	20:54	20:55	20:25	19:34	18:42	16:59	16:45	75	14:02 (110)								
13	07:46	08:41 (111)	07:18	07:34	06:41	05:59	05:40	05:52	06:22	06:54	07:27	07:05		07:38	08:28 (111)									
	17:07	58	09:39 (49)	17:46	19:21	19:56	20:29	20:55	20:55	20:24	19:32	18:40	16:58	7 08:51 (49) 07:38	78	14:04 (110)								
14	07:45	08:40 (111)	07:17	07:33	06:39	05:58	05:40	05:52	06:23	06:56	07:28	07:06		07:39	08:29 (111)									
	17:08	59	09:39 (49)	17:48	19:22	19:57	20:30	20:55	20:54	20:23	19:30	18:38	16:57	15 09:02 (49) 07:45	78	14:05 (110)								
15	07:45	08:41 (111)	07:15	07:31	06:38	05:57	05:40	05:53	06:24	06:57	07:30	07:08		07:40	08:30 (111)									
	17:09	58	09:39 (49)	17:49	19:23	19:59	20:31	20:56	20:54	20:21	19:29	18:37	16:56	20 09:05 (49) 07:45	80	14:07 (110)								
16	07:44	08:41 (111)	07:14	07:29	06:36	05:56	05:40	05:54	06:25	06:58	07:31	07:09		07:40	08:29 (111)									
	17:10	58	09:39 (49)	17:50	19:24	20:00	20:32	20:56	20:53	20:20	19:27	18:35	16:55	31 09:07 (49) 07:46	82	14:07 (110)								
17	07:44	08:43 (111)	07:12	07:27	06:35	05:55	05:40	05:55	06:26	06:59	07:32	07:10		07:41	08:30 (111)									
	17:12	56	09:39 (49)	17:51	19:26	20:00	20:33	20:57	20:53	20:18	19:25	18:33	16:54	38 09:08 (49) 07:46	83	14:08 (110)								
18	07:43	08:43 (111)	07:11	07:26	06:33	05:54	05:40	05:56	06:27	07:00	07:33	07:11		07:42	08:31 (111)									
	17:13	56	09:39 (49)	17:53	19:27	20:01	20:34	20:57	20:52	20:17	19:23	18:32	16:53	44 09:10 (49) 07:46	82	14:09 (110)								
19	07:43	08:43 (111)	07:10	07:24	06:31	05:53	05:40	05:57	06:28	07:01	07:34	07:13		07:42	08:31 (111)									
	17:14	55	09:38 (49)	17:54	19:28	20:02	20:35	20:57	20:51	20:15	19:21	18:30	16:53	48 09:11 (49) 07:47	84	14:10 (110)								
20	07:42	08:45 (111)	07:08	07:22	06:30	05:52	05:40	05:57	06:29	07:02	07:35	07:14		07:43	08:32 (111)									
	17:15	54	09:39 (49)	17:55	19:29	20:03	20:36	20:58	20:50	20:14	19:20	18:29	16:52	51 09:12 (49) 07:47	84	14:11 (110)								
21	07:41	08:45 (111)	07:07	07:20	06:28	05:51	05:40	05:58	06:30	07:03	07:37	07:15		07:43	08:32 (111)									
	17:17	53	09:38 (49)	17:57	19:30	20:04	20:37	20:58	20:50	20:12	19:18	18:27	16:51	53 09:14 (49) 07:47	84	14:11 (110)								
22	07:41	08:46 (111)	07:05	07:19	06:27	05:50	05:41	05:59	06:31	07:04	07:38	07:16		07:44	08:33 (111)									
	17:18	51	09:37 (49)	17:58	19:31	20:05	20:38	20:58	20:49	20:11	19:16	18:26	16:50	54 09:15 (49) 07:48	84	14:12 (110)								
23	07:40	08:48 (111)	07:04	07:17	06:25	05:49	05:41	06:00	06:32	07:05	07:39	07:17		07:44	08:33 (111)									
	17:19	48	09:37 (49)	17:59	19:32	20:06	20:39	20:58	20:48	20:09	19:14	18:24	16:50	55 09:15 (49) 07:48	84	14:12 (110)								
24	07:39	08:49 (111)	07:02	07:15	06:24	05:49	05:41	06:01	06:33	07:06	07:40	07:19		07:45	08:34 (111)									
	17:20	44	09:36 (49)	18:00	19:34	20:08	20:40	20:58	20:47	20:08	19:13	18:23	16:49	56 09:16 (49) 07:49	84	14:13 (110)								
25	07:39	08:51 (111)	07:01	07:13	06:22	05:48	05:41	06:02	06:34	07:07	07:42	07:20		07:45	08:34 (111)									
	17:22	38	09:35 (49)	18:02	19:35	20:09	20:41	20:59	20:46	20:06	19:11	18:21	16:49	56 09:17 (49) 07:49	84	14:13 (110)								
26	07:38	08:54 (111)	06:59	07:12	06:21	05:47	05:42	06:03	06:35	07:08	07:43	07:21		07:46	08:34 (111)									
	17:23	31	09:34 (49)	18:03	19:36	20:10	20:42	20:59	20:45	20:04	19:09	18:20	16:48	57 09:18 (49) 07:46	82	14:12 (110)								
27	07:37	09:12 (49)	06:57	07:10	06:19	05:46	05:42	06:04	06:36	07:09	07:44	07:22		07:46	08:35 (111)									
	17:24	20	09:32 (49)	18:04	19:37	20:11	20:42	20:59	20:44	20:03	19:07	18:18	16:48	58 09:18 (49) 07:46	82	14:13 (110)								
28	07:36	09:15 (49)	06:56	07:08	06:18	05:46	05:42	06:05	06:38	07:11	07:45	07:23		07:46	08:35 (111)									
	17:25	15	09:30 (49)	18:05	19:38	20:12	20:43	20:59	20:43	20:01	19:06	18:17	16:47	59 09:19 (49) 07:46	82	14:13 (110)								
29	07:35	09:19 (49)		07:07	06:16	05:45	05:43	06:06	06:39	07:12	07:46	07:24		07:46	08:36 (111)									
	17:27	7	09:26 (49)		19:39	20:13	20:44	20:59	20:42	20:00	19:04	18:16	16:47	58 09:19 (49) 07:46	79	14:12 (110)								
30	07:34			07:05	06:15	05:44	05:43	06:07	06:40	07:13	07:48	07:25		07:47	08:36 (111)									
	17:28			19:40	20:14	20:45	20:59	20:41	19:56	19:02	18:14	16:46	58 09:20 (49) 07:47	78	14:12 (110)									
31	07:33			07:03		05:44		06:08	06:41		07:49			07:47	08:36 (111)									
	17:29			19:42		20:46		20:40	19:55		18:13			16:54	76	14:11 (110)								
Potential sun hours	294		295		370		401		452		457		464		431		375		343		294		283	
Total, worst case	1489																				818		2294	
Sun reduction	0.31																				0.29		0.27	
Oper. time red.	1.00																				1.00		1.00	
Wind dir. red.	0.58																				0.58		0.61	
Total reduction	0.18																				0.17		0.16	
Total, real	269																				138		376	

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 8

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217 Montgomery St.

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Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 44 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1255)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

January		February		March		April		May		June	
1	07:47	07:32		06:54		07:14 (114)	07:01		06:14	18:57 (21)	05:43
	16:55	17:31		18:06	16	07:30 (114)	19:43		20:15	19:52 (21)	20:47
2	07:47	07:31		06:53		07:12 (114)	07:00		06:12	18:57 (21)	05:43
	16:56	17:32		18:08	18	07:30 (114)	19:44		20:16	19:51 (21)	20:47
3	07:47	07:30		06:51		07:11 (114)	06:58		06:11	18:57 (21)	05:43
	16:57	17:33		18:09	20	07:31 (114)	19:45		20:17	19:51 (21)	20:48
4	07:47	07:29		06:49		07:09 (114)	06:56		06:10	18:57 (21)	05:42
	16:58	17:35		18:10	22	07:31 (114)	19:46		20:19	19:52 (21)	20:49
5	07:47	07:28		06:48		07:07 (114)	06:54		06:08	18:57 (21)	05:42
	16:59	17:36		18:11	24	07:31 (114)	19:47		20:20	19:52 (21)	20:50
6	07:47	07:27		06:46		07:06 (114)	06:53		06:07	18:56 (21)	05:41
	17:00	17:37		18:13	26	07:32 (114)	19:48		20:21	19:51 (21)	20:50
7	07:47	07:25		06:44		07:06 (114)	06:51		06:06	18:57 (21)	05:41
	17:01	17:39		18:14	25	07:31 (114)	19:49		20:22	19:51 (21)	20:51
8	07:47	07:24		07:43		08:05 (114)	06:49		06:05	18:57 (21)	05:41
	17:02	17:40		19:15	25	08:30 (114)	19:50		20:23	19:51 (21)	20:52
9	07:47	07:23		07:41		08:06 (114)	06:48		06:03	18:57 (21)	05:41
	17:03	17:41		19:16	24	08:30 (114)	19:52		20:24	19:51 (21)	20:52
10	07:46	07:22		07:39		08:06 (114)	06:46		06:02	18:58 (21)	05:40
	17:04	17:42		19:17	23	08:29 (114)	19:53		20:25	19:50 (21)	20:53
11	07:46	07:20		07:38		08:07 (114)	06:44		06:01	18:58 (21)	05:40
	17:05	17:44		19:18	21	08:28 (114)	19:54		20:26	19:50 (21)	20:53
12	07:46	07:19		07:36		08:08 (114)	06:43		06:00	18:58 (21)	05:40
	17:06	17:45		19:20	18	08:26 (114)	19:55		20:27	19:50 (21)	20:54
13	07:45	07:18		07:34		08:10 (114)	06:41		05:59	18:59 (21)	05:40
	17:07	17:46		19:21	14	08:24 (114)	19:56		20:28	19:49 (21)	20:55
14	07:45	07:16		07:32		08:12 (114)	06:39		19:22 (21)	18:59 (21)	05:40
	17:08	17:48		19:22	9	08:21 (114)	19:57	12	19:34 (21)	19:49 (21)	20:55
15	07:45	07:15		07:31		06:38			19:17 (21)	19:00 (21)	05:40
	17:09	17:49		19:23		19:58	19	19:36 (21)	20:31	19:48 (21)	20:55
16	07:44	07:14		07:29		06:36			19:14 (21)	19:00 (21)	05:40
	17:11	17:50		19:24		20:00	23	19:37 (21)	20:32	19:48 (21)	20:56
17	07:44	07:12		07:27		06:35			19:11 (21)	19:01 (21)	05:40
	17:12	17:51		19:25		20:00	27	19:38 (21)	20:33	19:47 (21)	20:56
18	07:43	07:11		07:26		06:33			19:09 (21)	19:01 (21)	05:40
	17:13	17:53		19:27		20:01	29	19:38 (21)	20:34	19:47 (21)	20:57
19	07:43	07:09		07:24		06:31			19:07 (21)	19:02 (21)	05:40
	17:14	17:54		19:28		20:02	33	19:40 (21)	20:35	19:46 (21)	20:57
20	07:42	07:08		07:22		06:30			19:05 (21)	19:03 (21)	05:40
	17:15	17:55		19:29		20:03	36	19:41 (21)	20:36	19:45 (21)	20:57
21	07:41	07:06		07:20		06:28			19:04 (21)	19:03 (21)	05:40
	17:17	17:57		19:30		20:04	38	19:42 (21)	20:37	19:44 (21)	20:58
22	07:41	07:05		07:19		06:27			19:03 (21)	19:05 (21)	05:41
	17:18	17:58		19:31		20:05	40	19:43 (21)	20:38	19:44 (21)	20:58
23	07:40	07:03		07:17		06:25			19:02 (21)	19:05 (21)	05:41
	17:19	17:59		19:32		20:06	42	19:44 (21)	20:39	19:43 (21)	20:58
24	07:39	07:02		07:15		06:24			19:01 (21)	19:06 (21)	05:41
	17:20	18:00		19:34		20:07	44	19:45 (21)	20:39	19:42 (21)	20:58
25	07:38	07:00		07:13		06:22			19:00 (21)	19:08 (21)	05:41
	17:22	18:02		19:35		20:09	46	19:46 (21)	20:40	19:42 (21)	20:58
26	07:38	06:59		07:12		06:21			19:00 (21)	19:08 (21)	05:42
	17:23	18:03		19:36		20:10	48	19:48 (21)	20:41	19:41 (21)	20:58
27	07:37	06:57	07:17 (114)	07:10		06:19			18:59 (21)	19:09 (21)	05:42
	17:24	18:04	9	07:26 (114)	19:37	20:11	49	19:48 (21)	20:42	19:40 (21)	20:58
28	07:36	06:56	07:16 (114)	07:08		06:18			18:59 (21)	06:21 (66)	05:42
	17:25	18:05	13	07:29 (114)	19:38	20:12	51	19:50 (21)	20:43	19:40 (21)	20:59
29	07:35			07:06		06:16			18:57 (21)	06:17 (66)	05:43
	17:27			19:39		20:13	53	19:50 (21)	20:44	19:38 (21)	20:59
30	07:34			07:05		06:15			18:57 (21)	06:15 (66)	05:43
	17:28			19:40		20:14	54	19:51 (21)	20:45	19:38 (21)	20:58
31	07:33			07:03					05:44	06:13 (66)	
	17:29			19:41					20:46	19:36 (21)	
Potential sun hours	294	295		370		401		452		457	
Total, worst case		22		285		644		1430		1118	
Sun reduction		0.38		0.46		0.51		0.56		0.65	
Oper. time red.		1.00		1.00		1.00		1.00		1.00	
Wind dir. red.		0.58		0.58		0.58		0.59		0.68	
Total reduction		0.22		0.27		0.30		0.33		0.44	
Total, real		5		76		190		468		494	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 9

Licensed user:

EDR

217 Montgomery St.

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Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 44 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1255)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

July		August		September		October		November		December	
1	05:44	06:12 (66)	06:09	19:09 (21)	06:42	07:14	07:48 (114)	06:50	07:26		
2	05:48	36 06:48 (66)	20:39	51 20:00 (21)	19:53	19:00	17 08:05 (114)	17:12	16:46		
3	05:44	06:13 (66)	06:10	19:07 (21)	06:43	07:15	07:46 (114)	06:51	07:27		
4	05:48	36 06:49 (66)	20:38	53 20:00 (21)	19:51	18:58	20 08:06 (114)	17:10	16:46		
5	05:45	06:13 (66)	06:11	19:07 (21)	06:44	07:16	07:44 (114)	06:52	07:28		
6	05:48	35 06:48 (66)	20:37	53 20:00 (21)	19:49	18:57	22 08:06 (114)	17:09	16:45		
7	05:45	06:14 (66)	06:12	19:07 (21)	06:45	07:17	07:43 (114)	06:54	07:30		
8	05:48	34 06:48 (66)	20:36	53 20:00 (21)	19:48	18:55	24 08:07 (114)	17:08	16:45		
9	05:46	06:14 (66)	06:13	19:06 (21)	06:46	07:18	07:42 (114)	06:55	07:31		
10	05:48	33 06:47 (66)	20:34	54 20:00 (21)	19:46	18:53	25 08:07 (114)	17:07	16:45		
11	05:47	06:15 (66)	06:14	19:06 (21)	06:47	07:19	07:42 (114)	06:56	07:32		
12	05:48	33 06:48 (66)	20:33	54 20:00 (21)	19:44	18:52	26 08:08 (114)	17:05	16:45		
13	05:47	06:15 (66)	06:15	19:06 (21)	06:48	07:20	07:42 (114)	06:57	07:32		
14	05:47	31 06:46 (66)	20:32	54 20:00 (21)	19:42	18:50	26 08:08 (114)	17:04	16:45		
15	05:48	06:16 (66)	06:16	19:06 (21)	06:49	07:21	07:42 (114)	06:59	07:33		
16	05:49	30 06:46 (66)	20:31	54 20:00 (21)	19:41	18:48	25 08:07 (114)	17:03	16:45		
17	05:49	06:18 (66)	06:17	19:05 (21)	06:50	07:23	07:43 (114)	07:00	07:34		
18	05:47	36 19:37 (21)	20:29	55 20:00 (21)	19:39	18:47	23 08:06 (114)	17:02	16:45		
19	05:49	06:18 (66)	06:18	19:05 (21)	06:51	07:24	07:44 (114)	07:01	07:35		
20	05:46	40 19:39 (21)	20:28	55 20:00 (21)	19:37	18:45	21 08:05 (114)	17:01	16:45		
21	05:50	06:20 (66)	06:19	19:05 (21)	06:52	07:25	07:45 (114)	07:02	07:36		
22	05:46	41 19:42 (21)	20:27	55 20:00 (21)	19:36	18:43	19 08:04 (114)	17:00	16:45		
23	05:51	06:21 (66)	06:21	19:05 (21)	06:53	07:26	07:47 (114)	07:04	07:37		
24	05:52	42 19:44 (21)	20:25	54 19:59 (21)	19:34	18:42	17 08:04 (114)	16:59	16:45		
25	05:52	06:23 (66)	06:22	19:06 (21)	06:54	07:27	07:48 (114)	07:05	07:38		
26	05:55	41 19:45 (21)	20:24	54 20:00 (21)	19:32	18:40	14 08:02 (114)	16:58	16:45		
27	05:52	06:24 (66)	06:23	19:06 (21)	06:55	07:28	07:49 (114)	07:06	07:39		
28	05:54	41 19:46 (21)	20:23	53 19:59 (21)	19:30	18:38	11 08:00 (114)	16:57	16:45		
29	05:53	06:27 (66)	06:24	19:06 (21)	06:57	07:29	07:50 (114)	07:07	07:39		
30	05:54	38 19:47 (21)	20:21	51 19:57 (21)	19:28	18:37	7 07:57 (114)	16:56	16:45		
31	05:54	19:19 (21)	06:25	19:07 (21)	06:58	07:31		07:09	07:40		
1	05:53	30 19:49 (21)	20:20	49 19:56 (21)	19:27	18:35		16:55	16:46		
2	05:55	19:18 (21)	06:26	19:07 (21)	06:59	07:32		07:10	07:41		
3	05:52	32 19:50 (21)	20:18	47 19:54 (21)	19:25	18:33		16:54	16:46		
4	05:56	19:18 (21)	06:27	19:07 (21)	07:00	07:33		07:11	07:41		
5	05:52	33 19:51 (21)	20:17	46 19:53 (21)	19:23	18:32		16:53	16:46		
6	05:57	19:17 (21)	06:28	19:08 (21)	07:01	07:34		07:12	07:42		
7	05:51	35 19:52 (21)	20:15	43 19:51 (21)	19:21	18:30		16:53	16:47		
8	05:58	19:15 (21)	06:29	19:08 (21)	07:02	07:35		07:14	07:43		
9	05:50	37 19:52 (21)	20:14	42 19:50 (21)	19:20	18:29		16:52	16:47		
10	05:58	19:15 (21)	06:30	19:09 (21)	07:03	07:37		07:15	07:43		
11	05:50	38 19:53 (21)	20:12	39 19:48 (21)	19:18	18:27		16:51	16:47		
12	05:59	19:14 (21)	06:31	19:09 (21)	07:04	07:38		07:16	07:44		
13	05:49	40 19:54 (21)	20:11	38 19:47 (21)	19:16	18:26		16:51	16:48		
14	06:00	19:13 (21)	06:32	19:10 (21)	07:05	07:39		07:17	07:44		
15	05:48	42 19:55 (21)	20:09	35 19:45 (21)	19:14	18:24		16:50	16:48		
16	06:01	19:13 (21)	06:33	19:11 (21)	07:06	07:40		07:18	07:45		
17	05:47	43 19:56 (21)	20:07	33 19:44 (21)	19:13	18:23		16:49	16:49		
18	06:02	19:12 (21)	06:34	19:13 (21)	07:07	07:41		07:20	07:45		
19	05:46	45 19:57 (21)	20:06	29 19:42 (21)	19:11	18:21		16:49	16:50		
20	06:03	19:12 (21)	06:35	19:14 (21)	07:08	07:43		07:21	07:45		
21	05:45	45 19:57 (21)	20:04	27 19:41 (21)	19:09	18:20		16:48	16:50		
22	06:04	19:11 (21)	06:36	19:16 (21)	07:09	07:44		07:22	07:46		
23	05:44	47 19:58 (21)	20:03	23 19:39 (21)	19:07	18:18		16:48	16:51		
24	06:05	19:11 (21)	06:38	19:19 (21)	07:10	07:45		07:23	07:46		
25	05:43	48 19:59 (21)	20:01	18 19:37 (21)	19:05	18:17		16:47	16:52		
26	06:06	19:10 (21)	06:39	19:23 (21)	07:12	07:46		07:24	07:46		
27	05:42	49 19:59 (21)	19:58	12 19:35 (21)	19:04	4 07:59 (114)		16:47	16:52		
28	06:07	19:10 (21)	06:40		07:13	07:50 (114)		07:25	07:46		
29	05:41	50 20:00 (21)	19:56		19:02	13 08:03 (114)		16:46	16:53		
30	06:08	19:09 (21)	06:41			07:49			07:47		
31	05:40	51 20:00 (21)	19:54			18:13			16:54		
Potential sun hours	463		431		375		343		294		283
Total, worst case	1212		1284		17		297				
Sun reduction	0.67		0.64		0.57		0.50				
Oper. time red.	1.00		1.00		1.00		1.00				
Wind dir. red.	0.62		0.58		0.58		0.58				
Total reduction	0.41		0.37		0.33		0.29				
Total, real	500		477		6		86				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
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Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 10

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 50 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1257)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

January		February		March		April		May		June	
1	07:47	07:32	16:00 (27)	06:54		07:01	18:51 (29)	06:14	05:43		
	16:55	17:31	16:33 (27)	18:06		19:42	19:05 (29)	20:15	20:46		
2	07:47	07:31	16:01 (27)	06:52	17:14 (28)	06:59	18:50 (29)	06:12	05:43		
	16:56	17:32	16:33 (27)	18:08	8	17:22 (28)	19:44	19:07 (29)	20:16	20:47	
3	07:47	07:30	16:02 (27)	06:51	17:11 (28)	06:58	18:48 (29)	06:11	05:42		
	16:57	17:33	16:33 (27)	18:09	15	17:26 (28)	19:45	19:08 (29)	20:17	20:48	
4	07:47	07:29	16:01 (27)	06:49	17:09 (28)	06:56	18:46 (29)	06:09	05:42		
	16:58	17:34	16:32 (27)	18:10	18	17:27 (28)	19:46	19:08 (29)	20:19	20:49	
5	07:47	07:28	16:02 (27)	06:48	17:07 (28)	06:54	18:46 (29)	06:08	05:42		
	16:58	17:36	16:32 (27)	18:11	21	17:28 (28)	19:47	19:09 (29)	20:20	20:50	
6	07:47	07:26	16:03 (27)	06:46	17:06 (28)	06:53	18:45 (29)	06:07	05:41		
	16:59	17:37	16:31 (27)	18:12	24	17:30 (28)	19:48	19:09 (29)	20:21	20:50	
7	07:47	07:25	16:04 (27)	06:44	17:05 (28)	06:51	18:45 (29)	06:06	05:41		
	17:00	17:38	16:31 (27)	18:14	25	17:30 (28)	19:49	19:08 (29)	20:22	20:51	
8	07:47	07:24	16:06 (27)	07:43	18:03 (28)	06:49	18:45 (29)	06:04	05:41		
	17:01	17:40	16:30 (27)	19:15	27	18:30 (28)	19:50	19:09 (29)	20:23	20:52	
9	07:46	07:23	16:07 (27)	07:41	18:02 (28)	06:48	18:45 (29)	06:03	05:40		
	17:03	17:41	16:28 (27)	19:16	28	18:30 (28)	19:52	19:08 (29)	20:24	20:52	
10	07:46	07:22	16:09 (27)	07:39	18:03 (28)	06:46	18:45 (29)	06:02	05:40		
	17:04	17:42	16:27 (27)	19:17	28	18:31 (28)	19:53	19:07 (29)	20:25	20:53	
11	07:46	07:20	16:12 (27)	07:38	18:02 (28)	06:44	18:46 (29)	06:01	05:40		
	17:05	17:44	16:25 (27)	19:18	28	18:30 (28)	19:54	19:06 (29)	20:26	20:53	
12	07:46	07:19	16:07 (27)	07:36	18:02 (28)	06:43	18:46 (29)	06:00	05:40		
	17:06	17:45	16:09 (27)	19:20	28	18:30 (28)	19:55	19:05 (29)	20:27	20:54	
13	07:45	16:09 (27)	07:18	07:34	18:03 (28)	06:41	18:47 (29)	05:59	05:40		
	17:07	16:14 (27)	17:46	19:21	27	18:30 (28)	19:56	19:02 (29)	20:28	20:54	
14	07:45	16:06 (27)	07:16	07:32	18:03 (28)	06:39	18:49 (29)	05:58	05:40		
	17:08	16:17 (27)	17:47	19:22	26	18:29 (28)	19:57	19:01 (29)	20:29	20:55	
15	07:45	16:05 (27)	07:15	07:31	18:03 (28)	06:38	18:53 (29)	05:57	05:40		
	17:09	16:20 (27)	17:49	19:23	25	18:28 (28)	19:58	18:56 (29)	20:30	20:55	
16	07:44	16:03 (27)	07:14	07:29	18:03 (28)	06:36		05:56	05:40		
	17:10	16:21 (27)	17:50	19:24	23	18:26 (28)	19:59	20:32	20:56		
17	07:44	16:02 (27)	07:12	07:27	18:05 (28)	06:34		05:55	05:40		
	17:12	16:22 (27)	17:51	19:25	20	18:25 (28)	20:01	20:33	20:56		
18	07:43	16:02 (27)	07:11	07:25	18:07 (28)	06:33		05:54	05:40		
	17:13	16:24 (27)	17:53	19:27	16	18:23 (28)	20:01	20:34	20:57		
19	07:42	16:01 (27)	07:09	07:24	18:09 (28)	06:31		05:53	05:40		
	17:14	16:25 (27)	17:54	19:28	11	18:20 (28)	20:02	20:35	20:57		
20	07:42	16:01 (27)	07:08	07:22		06:30		05:52	05:40		
	17:15	16:27 (27)	17:55	19:29		20:03		20:36	20:57		
21	07:41	16:00 (27)	07:06	07:20		06:28		05:51	05:40		
	17:16	16:28 (27)	17:56	19:30		20:04		20:37	20:58		
22	07:41	16:00 (27)	07:05	07:19		06:27		05:50	05:40		
	17:18	16:28 (27)	17:58	19:31		20:05		20:38	20:58		
23	07:40	15:59 (27)	07:03	07:17		06:25		05:49	05:41		
	17:19	16:29 (27)	17:59	19:32		20:06		20:39	20:58		
24	07:39	15:59 (27)	07:02	07:15		06:24		05:48	05:41		
	17:20	16:29 (27)	18:00	19:33		20:07		20:39	20:58		
25	07:38	16:00 (27)	07:00	07:13		06:22		05:48	05:41		
	17:21	16:31 (27)	18:01	19:35		20:08		20:40	20:58		
26	07:37	16:00 (27)	06:59	07:12		06:21		05:47	05:42		
	17:23	16:31 (27)	18:03	19:36		20:10		20:41	20:58		
27	07:37	15:59 (27)	06:57	07:10		06:19		05:46	05:42		
	17:24	16:32 (27)	18:04	19:37		20:11		20:42	20:58		
28	07:36	15:59 (27)	06:56	07:08		06:18		05:46	05:42		
	17:25	16:32 (27)	18:05	19:38		20:12		20:43	20:59		
29	07:35	16:00 (27)		07:06		06:16		05:45	05:43		
	17:27	16:33 (27)		19:39		20:13		20:44	20:59		
30	07:34	16:00 (27)		07:05		06:15		05:44	05:43		
	17:28	16:33 (27)		19:40		20:14		20:45	20:58		
31	07:33	16:00 (27)		07:03	18:54 (29)			05:44			
	17:29	16:33 (27)		19:41	9	19:03 (29)		20:46			
Potential sun hours	294	295	370	401	452	457					
Total, worst case	484	288	407	281							
Sun reduction	0.31	0.38	0.46	0.51							
Oper. time red.	1.00	1.00	1.00	1.00							
Wind dir. red.	0.70	0.70	0.65	0.62							
Total reduction	0.22	0.27	0.30	0.32							
Total, real	106	77	124	90							

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 11

Licensed user:

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Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 50 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1257)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	July		August		September		October		November		December		
1	05:44	06:09			06:42		18:45 (29)	07:14		17:42 (28)	06:50	15:38 (27)	07:26
	20:58	20:39			19:53	20	19:05 (29)	19:00	27	18:09 (28)	17:12	15:57 (27)	16:46
2	05:44	06:10			06:43		18:44 (29)	07:15		17:41 (28)	06:51	15:36 (27)	07:27
	20:58	20:38			19:51	22	19:06 (29)	18:58	28	18:09 (28)	17:10	15:58 (27)	16:46
3	05:45	06:11			06:44		18:43 (29)	07:16		17:40 (28)	06:52	15:35 (27)	07:28
	20:58	20:37			19:49	23	19:06 (29)	18:57	29	18:09 (28)	17:09	15:59 (27)	16:45
4	05:45	06:12			06:45		18:42 (29)	07:17		17:40 (28)	06:54	15:34 (27)	07:29
	20:58	20:36			19:48	24	19:06 (29)	18:55	28	18:08 (28)	17:08	16:01 (27)	16:45
5	05:46	06:13			06:46		18:42 (29)	07:18		17:40 (28)	06:55	15:33 (27)	07:30
	20:58	20:34			19:46	23	19:05 (29)	18:53	27	18:07 (28)	17:07	16:01 (27)	16:45
6	05:47	06:14			06:47		18:41 (29)	07:19		17:40 (28)	06:56	15:32 (27)	07:31
	20:57	20:33			19:44	24	19:05 (29)	18:51	26	18:06 (28)	17:05	16:02 (27)	16:45
7	05:47	06:15			06:48		18:41 (29)	07:20		17:41 (28)	06:57	15:32 (27)	07:32
	20:57	20:32			19:42	23	19:04 (29)	18:50	25	18:06 (28)	17:04	16:03 (27)	16:45
8	05:48	06:16			06:49		18:41 (29)	07:21		17:42 (28)	06:59	15:31 (27)	07:33
	20:57	20:31			19:41	22	19:03 (29)	18:48	23	18:05 (28)	17:03	16:03 (27)	16:45
9	05:49	06:17			06:50		18:42 (29)	07:23		17:42 (28)	07:00	15:31 (27)	07:34
	20:57	20:29			19:39	20	19:02 (29)	18:46	21	18:03 (28)	17:02	16:03 (27)	16:44
10	05:49	06:18			06:51		18:43 (29)	07:24		17:44 (28)	07:01	15:31 (27)	07:35
	20:56	20:28			19:37	18	19:01 (29)	18:45	17	18:01 (28)	17:01	16:04 (27)	16:45
11	05:50	06:19			06:52		18:44 (29)	07:25		17:46 (28)	07:02	15:31 (27)	07:36
	20:56	20:27			19:35	15	18:59 (29)	18:43	12	17:58 (28)	17:00	16:04 (27)	16:45
12	05:51	06:20			06:53		18:46 (29)	07:26		07:04		15:31 (27)	07:37
	20:55	20:25			19:34	10	18:56 (29)	18:41		16:59	33	16:04 (27)	16:45
13	05:51	06:21			06:54		07:27			07:05		15:31 (27)	07:38
	20:55	20:24			19:32		18:40			16:58	33	16:04 (27)	16:45
14	05:52	06:23			06:55		07:28			07:06		15:31 (27)	07:38
	20:54	20:22			19:30		18:38			16:57	33	16:04 (27)	16:45
15	05:53	06:24			06:56		07:29			07:07		15:31 (27)	07:39
	20:54	20:21			19:28		18:37			16:56	33	16:04 (27)	16:45
16	05:54	06:25			06:57		07:31			07:09		15:33 (27)	07:40
	20:53	20:20			19:27		18:35			16:55	31	16:04 (27)	16:45
17	05:55	06:26			06:59		07:32			07:10		15:33 (27)	07:41
	20:52	20:18			19:25		18:33			16:54	31	16:04 (27)	16:46
18	05:56	06:27			07:00		07:33			07:11		15:33 (27)	07:41
	20:52	20:17			19:23		18:32			16:53	30	16:03 (27)	16:46
19	05:56	06:28			07:01		07:34			07:12		15:34 (27)	07:42
	20:51	20:15			19:21		18:30			16:53	30	16:04 (27)	16:46
20	05:57	06:29			07:02		07:35			07:14		15:35 (27)	07:43
	20:50	20:14			19:20		18:29			16:52	28	16:03 (27)	16:47
21	05:58	06:30			07:03		07:36			07:15		15:36 (27)	07:43
	20:49	20:12			19:18		18:27			16:51	27	16:03 (27)	16:47
22	05:59	06:31			07:04		07:38			07:16		15:37 (27)	07:44
	20:49	20:11			19:16		18:26			16:50	26	16:03 (27)	16:48
23	06:00	06:32			07:05		07:39			07:17		15:38 (27)	07:44
	20:48	20:09			19:14		18:24			16:50	24	16:02 (27)	16:48
24	06:01	06:33			07:06		17:54 (28)	07:40		07:18		15:39 (27)	07:45
	20:47	20:07			19:12	8	18:02 (28)	18:23		16:49	22	16:01 (27)	16:49
25	06:02	06:34			07:07		17:50 (28)	07:41		07:20		15:40 (27)	07:45
	20:46	20:06			19:11	15	18:05 (28)	18:21		16:49	20	16:00 (27)	16:49
26	06:03	06:35			07:08		17:47 (28)	07:43		07:21		15:42 (27)	07:45
	20:45	20:04			19:09	19	18:06 (28)	18:20		16:48	18	16:00 (27)	16:50
27	06:04	06:36			07:09		17:46 (28)	07:44		07:22		15:44 (27)	07:46
	20:44	20:03			19:07	22	18:08 (28)	18:18		16:47	15	15:59 (27)	16:51
28	06:05	06:37		18:54 (29)	07:10		17:45 (28)	07:45		07:23		15:46 (27)	07:46
	20:43	20:01	4	18:58 (29)	19:05	24	18:09 (28)	18:17		16:47	11	15:57 (27)	16:51
29	06:06	06:38		18:50 (29)	07:11		17:44 (28)	07:46		07:24		15:48 (27)	07:46
	20:42	19:58	12	19:02 (29)	19:04	25	18:09 (28)	18:16		16:47	7	15:55 (27)	16:52
30	06:07	06:40		18:48 (29)	07:13		17:42 (28)	07:47		16:44 (27)			07:46
	20:41	19:56	16	19:04 (29)	19:02	27	18:09 (28)	18:14	6	16:50 (27)			16:53
31	06:08	06:41		18:46 (29)			07:49			16:40 (27)			07:47
	20:40	19:54	19	19:05 (29)			18:13		14	16:54 (27)			16:54
Potential sun hours	463	431			375		343			294			283
Total, worst case			51		384		283			763			
Sun reduction			0.64		0.57		0.50			0.29			
Oper. time red.			1.00		1.00		1.00			1.00			
Wind dir. red.			0.62		0.63		0.66			0.70			
Total reduction			0.40		0.36		0.33			0.20			
Total, real			20		140		94			156			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 12

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 55 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1258)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April		May		June	July		August		September	October	November	December	
1	07:47 16:55	07:32 17:30	06:54 18:06	07:01 19:42		06:13 20:15		18:19 (97) 19:26 (96)	05:43 20:46	05:44 20:58	06:09 20:39	67	18:32 (97) 19:39 (96)	06:42 19:53	07:14 19:00	06:50 17:12	07:26 16:46
2	07:47 16:56	07:31 17:32	06:52 18:08	06:59 19:44		06:12 20:16		18:19 (97) 19:26 (96)	05:43 20:47	05:44 20:58	06:10 20:38	68	18:31 (97) 19:39 (96)	06:43 19:51	07:15 18:58	06:51 17:10	07:27 16:46
3	07:47 16:57	07:30 17:33	06:51 18:09	06:58 19:45		06:11 20:17		18:19 (97) 19:27 (96)	05:42 20:48	05:45 20:58	06:11 20:37	69	18:30 (97) 19:39 (96)	06:44 19:49	07:16 18:57	06:52 17:09	07:28 16:45
4	07:47 16:58	07:29 17:34	06:49 18:10	06:56 19:46		06:09 20:18		18:19 (97) 19:28 (96)	05:42 20:49	05:45 20:58	06:12 20:35	69	18:30 (97) 19:39 (96)	06:45 19:47	07:17 18:55	06:53 17:08	07:29 16:45
5	07:47 16:58	07:27 17:36	06:47 18:11	06:54 19:47		06:08 20:19		18:18 (97) 19:28 (96)	05:42 20:49	05:46 20:58	06:13 20:34	69	18:29 (97) 19:38 (96)	06:46 19:46	07:18 18:53	06:55 17:07	07:30 16:45
6	07:47 16:59	07:26 17:37	06:46 18:12	06:53 19:48		06:07 20:21		18:19 (97) 19:28 (96)	05:41 20:50	05:47 20:57	06:14 20:33	69	18:29 (97) 19:38 (96)	06:47 19:44	07:19 18:51	06:56 17:05	07:31 16:45
7	07:47 17:00	07:25 17:38	06:44 18:14	06:51 19:49		06:06 20:22		18:19 (97) 19:29 (96)	05:41 20:51	05:47 20:57	06:15 20:32	70	18:28 (97) 19:38 (96)	06:48 19:42	07:20 18:50	06:57 17:04	07:32 16:45
8	07:46 17:01	07:24 17:40	06:42 19:15	06:49 19:50		06:04 20:23		18:20 (97) 19:29 (96)	05:41 20:51	05:48 20:57	06:16 20:30	69	18:28 (97) 19:37 (96)	06:49 19:41	07:21 18:48	06:58 17:03	07:33 16:45
9	07:46 17:03	07:23 17:41	06:41 19:16	06:47 19:51		06:03 20:24		18:20 (97) 19:29 (96)	05:40 20:52	05:49 20:56	06:17 20:29	68	18:28 (97) 19:36 (96)	06:50 19:39	07:22 18:46	07:00 17:02	07:34 16:45
10	07:46 17:04	07:21 17:42	06:39 19:17	06:46 19:53		06:02 20:25		18:21 (97) 19:29 (96)	05:40 20:53	05:49 20:56	06:18 20:28	69	18:27 (97) 19:36 (96)	06:51 19:37	07:24 18:45	07:01 17:01	07:35 16:45
11	07:46 17:05	07:20 17:44	06:37 19:18	06:44 19:54		06:01 20:26		18:22 (97) 19:29 (96)	05:40 20:53	05:50 20:55	06:19 20:26	66	18:27 (97) 19:34 (96)	06:52 19:35	07:25 18:43	07:02 17:00	07:36 16:45
12	07:46 17:06	07:19 17:45	06:36 19:19	06:42 19:55		06:00 20:27		18:22 (97) 19:29 (96)	05:40 20:54	05:51 20:55	06:20 20:25	64	18:27 (97) 19:33 (96)	06:53 19:34	07:26 18:41	07:04 16:59	07:37 16:45
13	07:45 17:07	07:18 17:46	06:34 19:21	06:41 19:56		05:59 20:28		18:23 (97) 19:29 (96)	05:40 20:54	05:51 20:55	06:21 20:24	62	18:27 (97) 19:32 (96)	06:54 19:32	07:27 18:40	07:05 16:58	07:38 16:45
14	07:45 17:08	07:16 17:47	06:32 19:22	06:39 19:57		05:58 20:29		18:23 (97) 19:28 (96)	05:40 20:55	05:52 20:54	06:22 20:22	56	18:27 (97) 19:29 (96)	06:55 19:30	07:28 18:38	07:06 16:57	07:38 16:45
15	07:44 17:09	07:15 17:49	06:31 19:23	06:38 19:58		05:57 20:30		18:25 (97) 19:28 (96)	05:40 20:55	05:53 20:53	06:24 20:21	50	18:27 (97) 19:26 (96)	06:56 19:28	07:29 18:36	07:07 16:56	07:39 16:45
16	07:44 17:10	07:13 17:50	06:29 19:24	06:36 19:59		05:56 20:31		18:26 (97) 19:28 (96)	05:40 20:56	05:54 20:53	06:25 20:19	41	18:27 (97) 19:08 (97)	06:57 19:26	07:30 18:35	07:08 16:55	07:40 16:45
17	07:43 17:12	07:12 17:51	06:27 19:25	06:34 20:00	15	05:55 20:32	18:35 (97) 18:50 (97)	18:27 (97) 19:27 (96)	05:40 20:56	05:55 20:52	06:26 20:18	40	18:27 (97) 19:07 (97)	06:58 19:25	07:32 18:33	07:10 16:54	07:40 16:46
18	07:43 17:13	07:11 17:53	06:25 19:26	06:33 20:00	21	05:54 20:33	18:32 (97) 18:53 (97)	18:28 (97) 19:26 (96)	05:40 20:56	05:56 20:51	06:27 20:16	39	18:28 (97) 19:07 (97)	07:00 19:23	07:33 18:32	07:11 16:53	07:41 16:46
19	07:42 17:14	07:09 17:54	06:24 19:28	06:31 20:02	25	05:53 20:34	18:30 (97) 18:55 (97)	18:29 (97) 19:26 (96)	05:40 20:57	05:56 20:51	06:28 20:15	38	18:28 (97) 19:06 (97)	07:01 19:21	07:34 18:30	07:12 16:53	07:42 16:46
20	07:42 17:15	07:08 17:55	06:22 19:29	06:30 20:03	29	05:52 20:35	18:27 (97) 18:56 (97)	18:30 (97) 19:25 (96)	05:40 20:57	05:57 20:50	06:29 20:13	36	18:29 (97) 19:05 (97)	07:02 19:19	07:35 18:29	07:13 16:52	07:42 16:47
21	07:41 17:16	07:06 17:56	06:20 19:30	06:28 20:04	32	05:51 20:36	18:26 (97) 18:58 (97)	18:32 (97) 19:24 (96)	05:40 20:57	05:58 20:49	06:30 20:12	34	18:29 (97) 19:03 (97)	07:03 19:18	07:36 18:27	07:15 16:51	07:43 16:47
22	07:40 17:18	07:05 17:58	06:18 19:31	06:27 20:05	35	05:50 20:37	18:24 (97) 18:59 (97)	18:34 (97) 19:23 (96)	05:40 20:58	05:59 20:48	06:31 20:10	32	18:43 (97) 19:34 (96)	07:04 19:16	07:38 18:26	07:16 16:50	07:43 16:48
23	07:40 17:19	07:03 17:59	06:17 19:32	06:25 20:06	36	05:49 20:38	18:24 (97) 19:00 (97)	18:37 (97) 19:22 (96)	05:41 20:58	06:00 20:48	06:32 20:09	29	18:42 (97) 19:35 (96)	07:05 19:14	07:39 18:24	07:17 16:50	07:44 16:48
24	07:39 17:20	07:02 18:00	06:15 19:33	06:24 20:07	38	05:48 20:39	18:22 (97) 19:00 (97)	19:08 (96) 19:21 (96)	05:41 20:58	06:01 20:47	06:33 20:07	25	18:40 (97) 19:36 (96)	07:06 19:12	07:40 18:23	07:18 16:49	07:44 16:49
25	07:38 17:21	07:00 18:01	06:13 19:34	06:22 20:08	39	05:48 20:40	18:22 (97) 19:01 (97)	19:10 (96) 19:18 (96)	05:41 20:58	06:02 20:46	06:34 20:06	20	18:39 (97) 19:37 (96)	07:07 19:11	07:41 18:21	07:19 16:49	07:45 16:49
26	07:37 17:23	06:59 18:03	06:11 19:36	06:21 20:09	41	05:47 20:41	18:20 (97) 19:01 (97)	19:20 (96) 19:02 (96)	05:42 20:41	06:03 20:45	06:35 20:04	14	18:38 (97) 19:37 (96)	07:08 19:09	07:42 18:20	07:21 16:48	07:45 16:50
27	07:36 17:24	06:57 18:04	06:10 19:37	06:19 20:11	42	05:46 20:42	18:20 (97) 19:02 (97)	19:20 (96) 19:02 (96)	05:42 20:42	06:04 20:44	06:36 20:02	55	18:37 (97) 19:38 (96)	07:09 19:07	07:44 18:18	07:22 16:47	07:45 16:51
28	07:36 17:25	06:56 18:05	06:08 19:38	06:18 20:12	52	05:46 20:43	18:20 (97) 19:20 (96)	19:20 (96) 19:02 (96)	05:42 20:43	06:05 20:43	06:37 20:01	58	18:35 (97) 19:37 (96)	07:10 19:08	07:45 18:17	07:23 16:47	07:46 16:51
29	07:35 17:27	06:55 19:39	06:06 20:13	06:16 20:44	58	05:45 20:44	18:19 (97) 19:22 (96)	19:20 (96) 19:02 (96)	05:45 20:44	06:06 20:42	06:38 19:58	61	18:34 (97) 19:38 (96)	07:11 19:39	07:46 18:16	07:24 16:47	07:46 16:52
30	07:34 17:28	06:54 19:40	06:15 20:14	06:15 20:45	62	05:44 20:45	18:19 (97) 19:24 (96)	19:20 (96) 19:02 (96)	05:44 20:45	06:07 20:41	06:39 19:56	63	18:33 (97) 19:38 (96)	07:12 19:07	07:47 18:14	07:25 16:46	07:46 16:53
31	07:33 17:29	06:53 19:41	06:14 20:15	06:14 20:46		05:44 20:45		18:32 (97) 19:25 (96)	05:44 20:46	06:08 20:40	06:41 20:06	66	18:32 (97) 19:39 (96)	06:41 19:54	07:49 18:13	07:46 16:54	07:46 16:54
Potential sun hours	294	295	370	401		452		457	463		431		375	343	294	283	
Total, worst case																	
Sun reduction				0.51		0.56				0.67			1333				
Oper. time red.				1.00		1.00				1.00			1.00				
Wind dir. red.				0.60		0.59				0.59			0.60				
Total reduction				0.31		0.33				0.40			0.38				
Total, real				161		455				230			510				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 13

Licensed user:

EDR

217 Montgomery St.

US-SYRACUSE, NY 13202

(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 69 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1266)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

January		February		March		April		May		June	
1	07:47	15:37 (66)	07:32		06:54	16:47 (19)	07:01	06:14	05:43		
	16:55	28	16:05 (66)	17:31		18:06	22	17:09 (19)	19:43	20:15	20:46
2	07:47		15:37 (66)	07:31		06:52		16:48 (19)	06:59	06:12	05:43
	16:56	29	16:06 (66)	17:32		18:08	20	17:08 (19)	19:44	20:16	20:47
3	07:47		15:38 (66)	07:30		06:51		16:50 (19)	06:58	06:11	05:42
	16:57	28	16:06 (66)	17:33		18:09	16	17:06 (19)	19:45	20:17	20:48
4	07:47		15:38 (66)	07:29		06:49		16:53 (19)	06:56	06:10	05:42
	16:58	29	16:07 (66)	17:35		18:10	9	17:02 (19)	19:46	20:19	20:49
5	07:47		15:39 (66)	07:28		06:48			06:54	06:08	05:42
	16:59	28	16:07 (66)	17:36		18:11			19:47	20:20	20:50
6	07:47		15:39 (66)	07:26		06:46			06:53	06:07	05:41
	17:00	29	16:08 (66)	17:37		18:12			19:48	20:21	20:50
7	07:47		15:40 (66)	07:25		06:44			06:51	06:06	05:41
	17:01	29	16:09 (66)	17:38		18:14			19:49	20:22	20:51
8	07:47		15:39 (66)	07:24		07:43			06:49	06:05	05:41
	17:02	29	16:08 (66)	17:40		19:15			19:50	20:23	20:52
9	07:47		15:40 (66)	07:23		07:41			06:48	06:03	05:40
	17:03	29	16:09 (66)	17:41		19:16			19:52	20:24	20:52
10	07:46		15:41 (66)	07:22		07:39			06:46	06:02	05:40
	17:04	29	16:10 (66)	17:42		19:17			19:53	20:25	20:53
11	07:46		15:41 (66)	07:20		07:38			06:44	06:01	05:40
	17:05	28	16:09 (66)	17:44		19:18			19:54	20:26	20:53
12	07:46		15:42 (66)	07:19		07:36			06:43	06:00	05:40
	17:06	28	16:10 (66)	17:45		19:20			19:55	20:27	20:54
13	07:45		15:43 (66)	07:18	16:56 (19)	07:34			06:41	05:59	05:40
	17:07	27	16:10 (66)	17:46	6	17:02 (19)	19:21		19:56	20:28	20:54
14	07:45		15:43 (66)	07:16	16:53 (19)	07:32			06:39	05:58	05:40
	17:08	27	16:10 (66)	17:48	13	17:06 (19)	19:22		19:57	20:29	20:55
15	07:45		15:44 (66)	07:15	16:50 (19)	07:31			06:38	05:57	05:40
	17:09	27	16:11 (66)	17:49	18	17:08 (19)	19:23		19:58	20:30	20:55
16	07:44		15:44 (66)	07:14	16:49 (19)	07:29			06:36	05:56	05:40
	17:10	26	16:10 (66)	17:50	21	17:10 (19)	19:24		19:59	20:32	20:56
17	07:44		15:45 (66)	07:12	16:47 (19)	07:27			06:34	05:55	05:40
	17:12	25	16:10 (66)	17:51	24	17:11 (19)	19:25		20:01	20:33	20:56
18	07:43		15:46 (66)	07:11	16:46 (19)	07:26			06:33	05:54	05:40
	17:13	24	16:10 (66)	17:53	26	17:12 (19)	19:27		20:01	20:34	20:57
19	07:42		15:47 (66)	07:09	16:45 (19)	07:24			06:31	05:53	05:40
	17:14	22	16:09 (66)	17:54	27	17:12 (19)	19:28		20:02	20:35	20:57
20	07:42		15:49 (66)	07:08	16:45 (19)	07:22			06:30	05:52	05:40
	17:15	20	16:09 (66)	17:55	28	17:13 (19)	19:29		20:03	20:36	20:57
21	07:41		15:50 (66)	07:06	16:44 (19)	07:20			06:28	05:51	05:40
	17:16	18	16:08 (66)	17:56	29	17:13 (19)	19:30		20:04	20:37	20:58
22	07:41		15:51 (66)	07:05	16:44 (19)	07:19			06:27	05:50	05:40
	17:18	16	16:07 (66)	17:58	30	17:14 (19)	19:31		20:05	20:38	20:58
23	07:40		15:53 (66)	07:03	16:44 (19)	07:17			06:25	05:49	05:41
	17:19	13	16:06 (66)	17:59	29	17:13 (19)	19:32		20:06	20:39	20:58
24	07:39		15:56 (66)	07:02	16:44 (19)	07:15			06:24	05:48	05:41
	17:20	7	16:03 (66)	18:00	29	17:13 (19)	19:33		20:07	20:39	20:58
25	07:38			07:00	16:44 (19)	07:13			06:22	05:48	05:41
	17:22			18:01	29	17:13 (19)	19:35		20:08	20:40	20:58
26	07:37			06:59	16:45 (19)	07:12			06:21	05:47	05:42
	17:23			18:03	28	17:13 (19)	19:36		20:10	20:41	20:58
27	07:37			06:57	16:45 (19)	07:10			06:19	05:46	05:42
	17:24			18:04	26	17:11 (19)	19:37		20:11	20:42	20:58
28	07:36			06:56	16:46 (19)	07:08			06:18	05:46	05:42
	17:25			18:05	25	17:11 (19)	19:38		20:12	20:43	20:59
29	07:35					07:06			06:16	05:45	05:43
	17:27					19:39			20:13	20:44	20:59
30	07:34					07:05			06:15	05:44	05:43
	17:28					19:40			20:14	20:45	20:58
31	07:33					07:03				05:44	
	17:29					19:41				20:46	
Potential sun hours	294		295		370		401		452		457
Total, worst case		595		388		67					
Sun reduction		0.31		0.38		0.46					
Oper. time red.		1.00		1.00		1.00					
Wind dir. red.		0.71		0.68		0.68					
Total reduction		0.22		0.26		0.31					
Total, real		131		100		21					

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 14

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 69 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1266)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	05:44	06:09	06:42	07:14	06:50	07:26
	20:58	20:39	19:53	19:00	17:12	16:46
2	05:44	06:10	06:43	07:15	06:51	07:27
	20:58	20:38	19:51	18:58	17:10	16:46
3	05:45	06:11	06:44	07:16	06:52	07:28
	20:58	20:37	19:49	18:57	17:09	16:45
4	05:45	06:12	06:45	07:17	06:54	07:29
	20:58	20:36	19:48	18:55	17:08	16:45
5	05:46	06:13	06:46	07:18	06:55	07:30
	20:58	20:34	19:46	18:53	17:07	16:45
6	05:47	06:14	06:47	07:19	06:56	07:31
	20:57	20:33	19:44	18:52	17:05	16:45
7	05:47	06:15	06:48	07:20	06:57	07:32
	20:57	20:32	19:42	18:50	17:04	16:45
8	05:48	06:16	06:49	07:21	06:59	07:33
	20:57	20:31	19:41	18:48	17:03	16:45
9	05:49	06:17	06:50	07:23	07:00	07:34
	20:57	20:29	19:39	18:46	17:02	16:45
10	05:49	06:18	06:51	07:24	17:26 (19)	07:01
	20:56	20:28	19:37	18:45	17:38 (19)	17:01
11	05:50	06:19	06:52	07:25	17:23 (19)	07:02
	20:56	20:27	19:35	18:43	17:40 (19)	17:00
12	05:51	06:20	06:53	07:26	17:21 (19)	07:04
	20:55	20:25	19:34	18:41	17:42 (19)	16:59
13	05:52	06:22	06:54	07:27	17:20 (19)	07:05
	20:55	20:24	19:32	18:40	17:43 (19)	16:58
14	05:52	06:23	06:55	07:28	17:18 (19)	07:06
	20:54	20:22	19:30	18:38	17:44 (19)	16:57
15	05:53	06:24	06:56	07:29	17:17 (19)	07:07
	20:54	20:21	19:28	18:37	17:44 (19)	16:56
16	05:54	06:25	06:58	07:31	17:16 (19)	07:09
	20:53	20:20	19:27	18:35	17:44 (19)	16:55
17	05:55	06:26	06:59	07:32	17:16 (19)	07:10
	20:52	20:18	19:25	18:33	17:45 (19)	16:54
18	05:56	06:27	07:00	07:33	17:16 (19)	07:11
	20:52	20:17	19:23	18:32	17:45 (19)	16:53
19	05:57	06:28	07:01	07:34	17:15 (19)	07:12
	20:51	20:15	19:21	18:30	17:45 (19)	16:53
20	05:57	06:29	07:02	07:35	17:15 (19)	07:14
	20:50	20:14	19:20	18:29	17:44 (19)	16:52
21	05:58	06:30	07:03	07:36	17:15 (19)	07:15
	20:49	20:12	19:18	18:27	17:43 (19)	16:51
22	05:59	06:31	07:04	07:38	17:16 (19)	07:16
	20:49	20:11	19:16	18:26	17:43 (19)	16:50
23	06:00	06:32	07:05	07:39	17:16 (19)	07:17
	20:48	20:09	19:14	18:24	17:42 (19)	16:50
24	06:01	06:33	07:06	07:40	17:16 (19)	07:18
	20:47	20:07	19:12	18:23	17:41 (19)	16:49
25	06:02	06:34	07:07	07:41	17:18 (19)	07:20
	20:46	20:06	19:11	18:21	17:41 (19)	16:49
26	06:03	06:35	07:08	07:43	17:19 (19)	07:21
	20:45	20:04	19:09	18:20	17:39 (19)	16:48
27	06:04	06:36	07:09	07:44	17:20 (19)	07:22
	20:44	20:03	19:07	18:18	17:37 (19)	16:48
28	06:05	06:37	07:10	07:45	17:22 (19)	07:23
	20:43	20:01	19:05	18:17	17:35 (19)	16:47
29	06:06	06:39	07:11	07:46	17:27 (19)	07:24
	20:42	19:58	19:04	18:16	17:30 (19)	16:47
30	06:07	06:40	07:13	07:47		07:25
	20:41	19:56	19:02	18:14		16:46
31	06:08	06:41		07:49		
	20:40	19:54		18:13		
Potential sun hours	463	431	375	343	294	283
Total, worst case				453	278	878
Sun reduction				0.50	0.29	0.27
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.68	0.71	0.71
Total reduction				0.34	0.21	0.19
Total, real				154	57	169

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

2015-08-31_Arkwright Summit_SFA

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Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
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Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 71 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1268)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

January		February		March	April	May	June	
1	07:47	14:57 (19)	07:32	06:54	07:01	06:14	05:43	06:06 (102)
2	07:47	14:58 (19)	07:31	06:52	07:00	06:12	05:43	06:05 (102)
3	07:47	14:59 (19)	07:30	06:51	06:58	06:11	05:42	06:05 (102)
4	07:47	15:00 (19)	07:29	06:49	06:56	06:10	05:42	06:04 (102)
5	07:47	15:01 (19)	07:28	06:48	06:54	06:08	05:42	06:04 (102)
6	07:47	15:02 (19)	07:27	06:46	06:53	06:07	05:41	06:04 (102)
7	07:47	15:04 (19)	07:25	06:44	06:51	06:06	05:41	06:04 (102)
8	07:47	15:04 (19)	07:24	06:43	06:49	06:05	05:41	06:03 (102)
9	07:47	15:06 (19)	07:23	06:41	06:48	06:03	05:40	06:03 (102)
10	07:46	15:08 (19)	07:22	06:39	06:46	06:02	05:40	06:03 (102)
11	07:46	15:09 (19)	07:20	06:38	06:44	06:01	05:40	06:03 (102)
12	07:46	15:11 (19)	07:19	06:36	06:43	06:00	05:40	06:03 (102)
13	07:45	15:15 (19)	07:18	06:34	06:41	05:59	05:40	06:03 (102)
14	07:45	15:22 (19)	07:16	06:32	06:39	05:58	05:40	06:03 (102)
15	07:45	15:24 (19)	07:15	06:31	06:38	05:57	05:40	06:03 (102)
16	07:44	15:25 (19)	07:14	06:30	06:36	05:56	05:40	06:03 (102)
17	07:44	15:27 (19)	07:13	06:29	06:34	05:55	05:40	06:03 (102)
18	07:43	15:29 (19)	07:12	06:28	06:33	05:54	05:40	06:03 (102)
19	07:43	15:31 (19)	07:11	06:27	06:32	05:53	05:40	06:03 (102)
20	07:42	15:33 (19)	07:10	06:26	06:31	05:52	05:40	06:03 (102)
21	07:41	15:35 (19)	07:09	06:25	06:30	05:51	05:40	06:03 (102)
22	07:41	15:37 (19)	07:08	06:24	06:29	05:50	05:40	06:04 (102)
23	07:40	15:39 (19)	07:07	06:23	06:28	05:49	05:40	06:04 (102)
24	07:39	15:41 (19)	07:06	06:22	06:27	05:48	05:40	06:04 (102)
25	07:38	15:43 (19)	07:05	06:21	06:26	05:47	05:40	06:04 (102)
26	07:37	15:45 (19)	07:04	06:20	06:25	05:46	05:40	06:05 (102)
27	07:36	15:47 (19)	07:03	06:19	06:24	05:45	05:40	06:05 (102)
28	07:35	15:49 (19)	07:02	06:18	06:23	05:44	05:40	06:06 (102)
29	07:34	15:51 (19)	07:01	06:17	06:22	05:43	05:40	06:06 (102)
30	07:33	15:53 (19)	07:00	06:16	06:21	05:42	05:40	06:06 (102)
31	07:32	15:55 (19)	06:59	06:15	06:20	05:41	05:40	06:06 (102)
Potential sun hours	294	294	295	370	401	452	457	1170
Total, worst case	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.65
Oper. time red.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Wind dir. red.	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.68
Total reduction	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.45
Total, real	65	65	65	65	65	65	65	521

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

2015-08-31_Arkwright Summit_SFA

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Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 71 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1268)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

July			August			September			October			November			December		
1	05:44		06:07 (102)	06:09		06:31 (102)	06:42		07:14		06:50				07:26	14:51 (19)	
2	05:48	39	06:46 (102)	20:39		06:43 (102)	19:53		19:00		17:12				16:46	15:07 (19)	
3	05:45		06:07 (102)	06:10		06:32 (102)	06:43		07:15		06:51				07:27	14:51 (19)	
4	05:48	39	06:46 (102)	20:38		06:42 (102)	19:51		18:58		17:10				16:46	15:10 (19)	
5	05:45		06:08 (102)	06:11		06:33 (102)	06:44		07:16		06:52				07:28	14:50 (19)	
6	05:48	39	06:47 (102)	20:37		06:40 (102)	19:49		18:57		17:09				16:45	15:11 (19)	
7	05:45		06:09 (102)	06:12		06:34 (102)	06:45		07:17		06:54				07:30	14:49 (19)	
8	05:48	39	06:48 (102)	20:36		06:38 (102)	19:48		18:55		17:08				16:45	15:12 (19)	
9	05:46		06:09 (102)	06:13		06:35 (102)	06:46		07:18		06:55				07:31	14:49 (19)	
10	05:48	38	06:47 (102)	20:34		06:36 (102)	19:46		18:53		17:07				16:45	15:13 (19)	
11	05:47		06:10 (102)	06:14			06:47		07:19		06:56				07:32	14:48 (19)	
12	05:48	38	06:48 (102)	20:33			19:44		18:52		17:05				16:45	15:14 (19)	
13	05:47		06:10 (102)	06:15			06:48		07:20		06:57				07:32	14:48 (19)	
14	05:48	38	06:48 (102)	20:32			19:42		18:50		17:04				16:45	15:15 (19)	
15	05:48		06:11 (102)	06:16			06:49		07:21		06:59				07:33	14:48 (19)	
16	05:49	37	06:48 (102)	20:31			19:41		18:48		17:03				16:45	15:16 (19)	
17	05:49		06:12 (102)	06:17			06:50		07:23		07:00				07:34	14:48 (19)	
18	05:49	37	06:49 (102)	20:29			19:39		18:46		17:02				16:45	15:17 (19)	
19	05:49		06:12 (102)	06:18			06:51		07:24		07:01				07:35	14:47 (19)	
20	05:49	36	06:48 (102)	20:28			19:37		18:45		17:01				16:45	15:17 (19)	
21	05:50		06:13 (102)	06:19			06:52		07:25		07:02				07:36	14:48 (19)	
22	05:50	36	06:49 (102)	20:27			19:35		18:43		17:00				16:45	15:18 (19)	
23	05:51		06:14 (102)	06:20			06:53		07:26		07:04				07:37	14:48 (19)	
24	05:51	35	06:49 (102)	20:25			19:34		18:41		16:59				16:45	15:19 (19)	
25	05:52		06:15 (102)	06:22			06:54		07:27		07:05				07:38	14:48 (19)	
26	05:52	35	06:50 (102)	20:24			19:32		18:40		16:58				16:45	15:20 (19)	
27	05:52		06:15 (102)	06:23			06:55		07:28		07:06				07:39	14:49 (19)	
28	05:54	34	06:49 (102)	20:22			19:30		18:38		16:57				16:45	15:21 (19)	
29	05:53		06:16 (102)	06:24			06:56		07:29		07:07				07:39	14:48 (19)	
30	05:54	33	06:49 (102)	20:21			19:28		18:37		16:56				16:45	15:20 (19)	
31	05:54		06:17 (102)	06:25			06:58		07:31		07:09				07:40	14:49 (19)	
1	05:53	33	06:50 (102)	20:20			19:27		18:35		16:55				16:46	15:21 (19)	
2	05:55		06:18 (102)	06:26			06:59		07:32		07:10				07:41	14:49 (19)	
3	05:52	32	06:50 (102)	20:18			19:25		18:33		16:54				16:46	15:22 (19)	
4	05:56		06:19 (102)	06:27			07:00		07:33		07:11				07:41	14:49 (19)	
5	05:52	31	06:50 (102)	20:17			19:23		18:32		16:53				16:46	15:22 (19)	
6	05:57		06:19 (102)	06:28			07:01		07:34		07:12				07:42	14:50 (19)	
7	05:51	30	06:49 (102)	20:15			19:21		18:30		16:53				16:47	15:23 (19)	
8	05:57		06:20 (102)	06:29			07:02		07:35		07:14				07:43	14:51 (19)	
9	05:50	29	06:49 (102)	20:14			19:20		18:29		16:52				16:47	15:24 (19)	
10	05:58		06:21 (102)	06:30			07:03		07:37		07:15				07:43	14:51 (19)	
11	05:49	28	06:49 (102)	20:12			19:18		18:27		16:51				16:47	15:24 (19)	
12	05:59		06:22 (102)	06:31			07:04		07:38		07:16				07:44	14:52 (19)	
13	05:49	27	06:49 (102)	20:11			19:16		18:26		16:50				16:48	15:25 (19)	
14	06:00		06:23 (102)	06:32			07:05		07:39		07:17				07:44	14:52 (19)	
15	05:48	26	06:49 (102)	20:09			19:14		18:24		16:50				16:48	15:25 (19)	
16	06:01		06:24 (102)	06:33			07:06		07:40		07:18				07:45	14:52 (19)	
17	05:47	25	06:49 (102)	20:07			19:12		18:23		16:49				16:49	15:25 (19)	
18	06:02		06:25 (102)	06:34			07:07		07:41		07:20				07:45	14:53 (19)	
19	05:46	24	06:49 (102)	20:06			19:11		18:21		16:49				16:50	15:26 (19)	
20	06:03		06:26 (102)	06:35			07:08		07:43		07:21				07:45	14:53 (19)	
21	05:45	22	06:48 (102)	20:04			19:09		18:20		16:48				16:50	15:26 (19)	
22	06:04		06:27 (102)	06:36			07:09		07:44		07:22				07:46	14:54 (19)	
23	05:44	21	06:48 (102)	20:03			19:07		18:18		16:48				16:51	15:26 (19)	
24	06:05		06:28 (102)	06:37			07:10		07:45		07:23				07:46	14:55 (19)	
25	05:43	19	06:47 (102)	20:01			19:05		18:17		16:47				16:52	15:27 (19)	
26	06:06		06:29 (102)	06:39			07:11		07:46		07:24				07:46	14:55 (19)	
27	05:42	18	06:47 (102)	19:58			19:04		18:16		16:47				15:02 (19)	16:52	32
28	06:07		06:30 (102)	06:40			07:13		07:47		07:25				14:52 (19)	07:46	32
29	05:41	16	06:46 (102)	19:56			19:02		18:14		16:46				15:05 (19)	16:53	32
30	06:08		06:30 (102)	06:41					07:49						07:47	14:57 (19)	
31	05:40	14	06:44 (102)	19:54					18:13						16:54	15:28 (19)	
Potential sun hours			463	431			375		343		294				283		
Total, worst case					34						20				921		
Sun reduction			0.67		0.64						0.29				0.27		
Oper. time red.			1.00		1.00						1.00				1.00		
Wind dir. red.			0.68		0.68						0.71				0.71		
Total reduction			0.46		0.44						0.21				0.19		
Total, real			435		15						4				177		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 17

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 72 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1269)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:47 16:55	07:32 17:31	06:54 18:06	07:01 19:43	06:14 20:15	06:34 (102) 20:47	05:44 20:58	06:09 20:39	06:31 (102) 19:53	07:14 19:00	06:50 17:12	07:26 16:46
2	07:47 16:56	07:31 17:32	06:52 18:08	07:00 19:44	06:12 20:16	06:32 (102) 20:47	05:44 20:58	06:10 20:38	06:32 (102) 19:51	07:15 18:58	06:51 17:10	07:27 16:46
3	07:47 16:57	07:30 17:33	06:51 18:09	06:58 19:45	06:11 20:17	06:31 (102) 20:48	05:45 20:58	06:11 20:37	06:33 (102) 19:49	07:16 18:57	06:52 17:09	07:28 16:45
4	07:47 16:58	07:29 17:35	06:49 18:10	06:56 19:46	06:10 20:19	06:30 (102) 20:49	05:45 20:58	06:12 20:36	06:34 (102) 19:48	07:17 18:55	06:54 17:08	07:30 16:45
5	07:47 16:59	07:28 17:36	06:48 18:11	06:54 19:47	06:08 20:20	06:29 (102) 20:50	05:46 20:58	06:13 20:34	06:35 (102) 19:46	07:18 18:53	06:55 17:07	07:31 16:45
6	07:47 17:00	07:26 17:37	06:46 18:13	06:53 19:48	06:07 20:21	06:27 (102) 20:50	05:47 20:58	06:13 20:33	06:36 (102) 19:44	07:19 18:52	06:56 17:05	07:32 16:45
7	07:47 17:01	07:25 17:38	06:44 18:14	06:51 19:49	06:06 20:22	06:26 (102) 20:51	05:41 20:57	06:15 20:32	06:37 (102) 19:42	07:20 18:50	06:57 17:04	07:32 16:45
8	07:47 17:02	07:24 17:40	07:43 19:15	06:49 19:50	06:05 20:23	06:25 (102) 20:52	05:48 20:57	06:16 20:31	06:38 (102) 19:41	07:21 18:48	06:59 17:03	07:33 16:45
9	07:47 17:03	07:23 17:41	07:41 19:16	06:48 19:52	06:03 20:24	06:24 (102) 20:52	05:49 20:57	06:17 20:29	06:39 (102) 19:39	07:23 18:46	07:00 17:02	07:34 16:45
10	07:46 17:04	07:22 17:42	07:39 19:17	06:46 19:53	06:02 20:25	06:23 (102) 20:53	05:49 20:56	06:18 20:28	06:40 (102) 19:37	07:24 18:45	07:01 17:01	07:35 16:45
11	07:46 17:05	07:20 17:44	07:38 19:18	06:44 19:54	06:01 20:26	06:22 (102) 20:53	05:50 20:56	06:19 20:27	06:41 (102) 19:35	07:25 18:43	07:02 17:00	07:36 16:45
12	07:46 17:06	07:19 17:45	07:36 19:20	06:43 19:55	06:00 20:27	06:21 (102) 20:54	05:51 20:55	06:20 20:25	06:42 (102) 19:34	07:26 18:41	07:04 16:59	07:37 16:45
13	07:45 17:07	07:18 17:46	07:34 19:21	06:41 19:56	05:59 20:28	06:20 (102) 20:55	05:52 20:55	06:22 20:24	06:43 (102) 19:32	07:27 18:40	07:05 16:58	07:38 16:45
14	07:45 17:08	07:16 17:48	07:32 19:22	06:39 19:57	05:58 20:29	06:19 (102) 20:55	05:52 20:54	06:23 20:22	06:44 (102) 19:30	07:28 18:38	07:06 16:57	07:39 16:45
15	07:45 17:09	07:15 17:49	07:31 19:23	06:38 19:58	05:57 20:30	06:18 (102) 20:55	05:53 20:54	06:24 20:21	06:46 (102) 19:28	07:29 18:37	07:07 16:56	07:39 16:45
16	07:44 17:10	07:14 17:50	07:29 19:24	06:36 19:59	05:56 20:32	06:17 (102) 20:56	05:54 20:53	06:25 20:20	06:47 (102) 19:27	07:30 18:35	07:09 16:55	07:40 16:46
17	07:44 17:12	07:12 17:51	07:27 19:25	06:34 20:01	05:55 20:33	06:16 (102) 20:56	05:55 20:52	06:26 20:18	06:48 (102) 19:25	07:32 18:33	07:10 16:54	07:41 16:46
18	07:43 17:13	07:11 17:53	07:26 19:27	06:33 20:03	05:54 20:34	06:15 (102) 20:57	05:56 20:52	06:27 20:17	06:49 (102) 19:23	07:33 18:32	07:11 16:53	07:41 16:46
19	07:43 17:14	07:09 17:54	07:24 19:28	06:31 20:02	05:53 20:35	06:14 (102) 20:50	05:57 20:51	06:28 20:15	06:50 (102) 19:21	07:34 18:30	07:12 16:53	07:42 16:47
20	07:42 17:15	07:08 17:55	07:22 19:29	06:30 20:03	05:52 20:36	06:13 (102) 20:50	05:57 20:50	06:29 20:14	06:51 (102) 19:20	07:35 18:29	07:14 16:52	07:43 16:47
21	07:41 17:17	07:06 17:57	07:20 19:30	06:28 20:04	05:51 20:37	06:12 (102) 20:58	05:58 20:49	06:30 20:12	06:52 (102) 19:18	07:37 18:27	07:15 16:51	07:43 16:47
22	07:41 17:18	07:05 17:58	07:19 19:31	06:27 20:05	05:50 20:38	06:12 (102) 20:51	05:59 20:49	06:31 20:11	06:53 (102) 19:16	07:38 18:26	07:16 16:50	07:44 16:48
23	07:40 17:19	07:03 17:59	07:17 19:32	06:25 20:06	05:49 20:39	06:13 (102) 20:58	06:00 20:48	06:32 20:09	06:54 (102) 19:14	07:39 18:24	07:17 16:50	07:44 16:48
24	07:39 17:20	07:02 18:00	07:15 19:33	06:24 20:07	05:48 20:39	06:13 (102) 20:58	06:01 20:47	06:33 20:07	06:55 (102) 19:12	07:40 18:23	07:18 16:49	07:45 16:49
25	07:38 17:22	07:00 18:02	07:13 19:35	06:22 20:08	05:48 20:40	06:13 (102) 20:58	06:02 20:46	06:34 20:06	06:56 (102) 19:11	07:41 18:21	07:20 16:49	07:45 16:50
26	07:38 17:23	06:59 18:03	07:12 19:36	06:21 20:10	05:47 20:41	06:14 (102) 20:58	06:03 20:45	06:35 20:04	06:57 (102) 19:09	07:43 18:20	07:21 16:48	07:45 16:50
27	07:37 17:24	06:57 18:04	07:10 19:37	06:19 20:11	05:46 20:42	06:15 (102) 20:58	06:04 20:44	06:36 20:03	06:58 (102) 19:07	07:44 18:18	07:22 16:48	07:46 16:51
28	07:36 17:25	06:56 18:05	07:08 19:38	06:18 20:12	05:46 20:43	06:16 (102) 20:59	06:05 20:43	06:37 20:01	06:59 (102) 19:05	07:45 18:17	07:23 16:47	07:46 16:52
29	07:35 17:27		07:06 19:39	06:16 20:13	05:45 20:44	06:17 (102) 20:59	06:06 20:42	06:39 19:58	06:59 (102) 19:04	07:46 18:16	07:24 16:47	07:46 16:52
30	07:34 17:28		07:05 19:40	06:15 20:14	05:44 20:45	06:18 (102) 20:58	06:07 20:41	06:40 19:56	06:59 (102) 19:02	07:47 18:14	07:25 16:46	07:46 16:53
31	07:33 17:29		07:03 19:41		05:44 20:46	06:18 (102) 20:58	06:08 20:40	06:41 19:54		07:49 18:13	07:26 16:45	07:47 16:54
Potential sun hours	294	295	370	401	452	457	463	431	375	343	294	283
Total, worst case				14	820	113	709	244				
Sun reduction				0.51	0.56	0.65	0.67	0.64				
Oper. time red.				1.00	1.00	1.00	1.00	1.00				
Wind dir. red.				0.67	0.67	0.67	0.67	0.67				
Total reduction				0.34	0.38	0.44	0.45	0.43				
Total, real				5	308	49	319	105				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 18

Licensed user:

EDR

217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar

Calculation: 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 81 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1278)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117		541	386	285 8,759

Idle start wind speed: Cut in wind speed from power curve

	January		February		March		April		May		June		July		August		September		October		November		December	
1	07:47		07:32		16:20 (22)	06:54	07:01	06:14	05:43	05:44	06:09	06:42	07:14		06:50		15:47 (22)	07:26						
	16:55		17:31	37	16:57 (22)	18:06	19:43	20:15	20:47	20:58	20:39	19:53	19:00		17:12	45	16:32 (22)	16:46						
2	07:47		07:31		16:20 (22)	06:53	07:00	06:12	05:43	05:44	06:10	06:43	07:15		06:51		15:47 (22)	07:27						
	16:56		17:32	38	16:58 (22)	18:08	19:44	20:16	20:47	20:58	20:38	19:51	18:58		17:10	44	16:31 (22)	16:46						
3	07:47		07:30		16:19 (22)	06:51	06:58	06:11	05:42	05:45	06:11	06:44	07:16		06:52		15:47 (22)	07:29						
	16:57		17:33	40	16:59 (22)	18:09	19:45	20:18	20:48	20:58	20:37	19:49	18:57		17:09	44	16:31 (22)	16:45						
4	07:47		07:29		16:19 (22)	06:49	06:56	06:10	05:42	05:45	06:12	06:45	07:17		06:54		15:48 (22)	07:30						
	16:58		17:35	41	17:00 (22)	18:10	19:46	20:19	20:49	20:58	20:36	19:48	18:55		17:08	43	16:31 (22)	16:45						
5	07:47		07:28		16:18 (22)	06:48	06:54	06:08	05:42	05:46	06:13	06:46	07:18		06:55		15:48 (22)	07:31						
	16:59		17:36	42	17:00 (22)	18:11	19:47	20:20	20:50	20:58	20:34	19:46	18:53		17:07	42	16:30 (22)	16:45						
6	07:47		07:27		16:18 (22)	06:46	06:53	06:07	05:41	05:47	06:14	06:47	07:19		06:56		15:48 (22)	07:32						
	17:00		17:37	43	17:01 (22)	18:13	19:48	20:21	20:50	20:58	20:33	19:44	18:52		17:05	42	16:30 (22)	16:45						
7	07:47		07:25		16:18 (22)	06:44	06:51	06:06	05:41	05:47	06:15	06:48	07:20		06:57		15:49 (22)	07:33						
	17:01		17:38	43	17:01 (22)	18:14	19:49	20:22	20:51	20:57	20:32	19:43	18:50		17:04	41	16:30 (22)	16:45						
8	07:47		07:24		16:18 (22)	07:43	06:49	06:05	05:41	05:48	06:16	06:49	07:21		06:59		15:49 (22)	07:33						
	17:02		17:40	44	17:02 (22)	19:15	19:50	20:23	20:52	20:57	20:31	19:41	18:48		17:03	40	16:29 (22)	16:45						
9	07:47		07:23		16:17 (22)	07:41	06:48	06:03	05:41	05:49	06:17	06:50	07:23		07:00		15:51 (22)	07:34						
	17:03		17:41	44	17:01 (22)	19:16	19:52	20:24	20:52	20:57	20:29	19:39	18:47		17:02	38	16:29 (22)	16:45						
10	07:46		07:22		16:17 (22)	07:39	06:46	06:02	05:40	05:49	06:18	06:51	07:24		07:01		15:51 (22)	07:35						
	17:04		17:42	45	17:02 (22)	19:17	19:53	20:25	20:53	20:56	20:28	19:37	18:45		17:01	37	16:28 (22)	16:45						
11	07:46		07:20		16:18 (22)	07:38	06:44	06:01	05:40	05:50	06:19	06:52	07:25		07:03		15:52 (22)	07:36						
	17:05		17:44	44	17:02 (22)	19:18	19:54	20:26	20:53	20:56	20:27	19:36	18:43		17:00	35	16:27 (22)	16:45						
12	07:46		07:19		16:17 (22)	07:36	06:43	06:00	05:40	05:51	06:20	06:53	07:26		07:04		15:54 (22)	07:37						
	17:06		17:45	45	17:02 (22)	19:20	19:55	20:27	20:54	20:55	20:25	19:34	18:42		16:59	33	16:27 (22)	16:45						
13	07:45		07:18		16:18 (22)	07:34	06:41	05:59	05:40	05:52	06:22	06:54	07:27		07:05		15:55 (22)	07:38						
	17:07		17:46	44	17:02 (22)	19:21	19:56	20:28	20:55	20:55	20:24	19:32	18:40		16:58	31	16:26 (22)	16:45						
14	07:45		07:16		16:19 (22)	07:32	06:39	05:58	05:40	05:52	06:23	06:55	07:28		07:06		15:56 (22)	07:39						
	17:08		17:48	43	17:02 (22)	19:22	19:57	20:29	20:55	20:54	20:23	19:30	18:38		16:57	28	16:24 (22)	16:45						
15	07:45		07:15		16:18 (22)	07:31	06:38	05:57	05:40	05:53	06:24	06:57	07:29		07:08		15:58 (22)	07:39						
	17:09		17:49	43	17:01 (22)	19:23	19:58	20:31	20:56	20:54	20:21	19:28	18:37		16:56	26	16:24 (22)	16:45						
16	07:44		07:14		16:19 (22)	07:29	06:36	05:56	05:40	05:54	06:25	06:58	07:31			17:06 (22)	07:09	15:59 (22)	07:40					
	17:10		17:50	42	17:01 (22)	19:24	20:00	20:32	20:56	20:53	20:20	19:27	18:35	11	17:17 (22)	16:55	23	16:22 (22)	16:46					
17	07:44		07:12		16:19 (22)	07:27	06:35	05:55	05:40	05:55	06:26	06:59	07:32			17:02 (22)	07:10	16:01 (22)	07:41					
	17:12		17:51	41	17:00 (22)	19:25	20:00	20:33	20:56	20:52	20:18	19:25	18:33	19	17:21 (22)	16:54	19	16:20 (22)	16:46					
18	07:43		07:11		16:20 (22)	07:26	06:33	05:54	05:40	05:56	06:27	07:00	07:33			16:59 (22)	07:11	16:05 (22)	07:41					
	17:13		17:53	40	17:00 (22)	19:27	20:01	20:34	20:57	20:52	20:17	19:23	18:32	25	17:24 (22)	16:53	13	16:18 (22)	16:46					
19	07:43		07:09		16:22 (22)	07:24	06:31	05:53	05:40	05:57	06:28	07:01	07:34			16:57 (22)	07:12		07:42					
	17:14		17:54	37	16:59 (22)	19:28	20:02	20:35	20:57	20:51	20:15	19:21	18:30	28	17:25 (22)	16:53			07:47					
20	07:42		07:08		16:22 (22)	07:22	06:30	05:52	05:40	05:57	06:29	07:02	07:35			16:55 (22)	07:14		07:43					
	17:15		17:55	36	16:58 (22)	19:29	20:03	20:36	20:57	20:50	20:14	19:20	18:29	31	17:26 (22)	16:52			07:47					
21	07:41		07:07		16:24 (22)	07:20	06:28	05:51	05:40	05:58	06:30	07:03	07:37			16:54 (22)	07:15		07:43					
	17:17		17:57	33	16:57 (22)	19:30	20:04	20:37	20:58	20:50	20:12	19:18	18:27	34	17:28 (22)	16:51			07:47					
22	07:41		07:05		16:25 (22)	07:19	06:27	05:50	05:41	05:59	06:31	07:04	07:38			16:52 (22)	07:16		07:44					
	17:18		17:58	30	16:55 (22)	19:31	20:05	20:38	20:58	20:49	20:11	19:16	18:26	37	17:29 (22)	16:50			07:48					
23	07:40		07:04		16:26 (22)	07:17	06:25	05:49	05:41	06:00	06:32	07:05	07:39			16:51 (22)	07:17		07:44					
	17:19		17:59	27	16:53 (22)	19:32	20:06	20:39	20:58	20:48	20:09	19:14	18:24	38	17:29 (22)	16:50			07:44					
24	07:39		07:02		16:29 (22)	07:15	06:24	05:49	05:41	06:01	06:33	07:06	07:40			16:50 (22)	07:18		07:45					
	17:20	13	16:44 (22)	18:00	22 16:51 (22)	19:34	20:07	20:40	20:58	20:47	20:08	19:13	18:23	39	17:29 (22)	16:49			07:45					
25	07:38		07:00		16:28 (22)	07:13	06:22	05:48	05:41	06:02	06:34	07:07	07:41			16:50 (22)	07:20		07:45					
	17:22	19	16:47 (22)	18:02	17 16:48 (22)	19:35	20:09	20:40	20:58	20:46	20:06	19:11	18:21	41	17:31 (22)	16:49			07:45					
26	07:38		06:59		16:26 (22)	07:12	06:21	05:47	05:42	06:03	06:35	07:08	07:43			16:49 (22)	07:21		07:45					
	17:23	23	16:49 (22)	18:03	6 16:43 (22)	19:36	20:10	20:41	20:58	20:45	20:04	19:09	18:20	42	17:31 (22)	16:48			07:45					
27	07:37		06:57		16:25 (22)	07:10	06:19	05:46	05:42	06:04	06:36	07:09	07:44			16:48 (22)	07:22		07:46					
	17:24	26	16:51 (22)	18:04		19:37	20:11	20:42	20:59	20:44	20:03	19:07	18:18	43	17:31 (22)	16:48			07:46					
28	07:36		06:56		16:24 (22)	07:08	06:18	05:46	05:42	06:05	06:37	07:10	07:45			16:48 (22)	07:23		07:46					
	17:25	28	16:52 (22)	18:05		19:38	20:12	20:43	20:59	20:43	20:01	19:05	18:17	44	17:32 (22)	16:47			07:46					
29	07:35		06:57		16:23 (22)	07:06	06:16	05:45	05:43	06:06	06:39	07:12	07:46			16:48 (22)	07:24		07:46					
	17:27	31	16:54 (22)			19:39	20:13	20:44	20:59	20:42	19:58	19:04	18:16	44	17:32 (22)	16:47			07:46					
30	07:34		06:57		16:22 (22)	07:05	06:15	05:44	05:43	06:07	06:40	07:13	07:48			16:47 (22)	07:25		07:47					
	17:28	33	16:55 (22)			19:40	20:14	20:45	20:59	20:41	19:56	19:02	18:14	44	17:31 (22)	16:46			07:47					
31	07:33		06:57		16:21 (22)	07:03		05:44		06:08	06:41	07:49				16:47 (22)			07:47					
	17:29	35																						

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 19

Licensed user:

EDR

217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar

Calculation: 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 82 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1279)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117		541	386	285 8,759

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1 07:47		07:32	16:05 (22)	06:54	07:01	06:14	05:43	05:44	06:09	06:42	07:14	
16:55		17:31	46 16:51 (22)	18:06	19:43	20:15	20:47	20:58	20:39	19:53	19:00	
2 07:47		07:31	16:05 (22)	06:53	07:00	06:12	05:43	05:44	06:10	06:43	07:15	
16:56		17:32	46 16:51 (22)	18:08	19:44	20:16	20:47	20:58	20:38	19:51	18:58	
3 07:47		07:30	16:05 (22)	06:51	06:58	06:11	05:42	05:45	06:11	06:44	07:16	
16:57		17:33	47 16:52 (22)	18:09	19:45	20:18	20:48	20:58	20:37	19:49	18:57	
4 07:47		07:29	16:05 (22)	06:49	06:56	06:10	05:42	05:45	06:12	06:45	07:17	
16:58		17:35	47 16:52 (22)	18:10	19:46	20:19	20:49	20:58	20:36	19:48	18:55	
5 07:47		07:28	16:04 (22)	06:48	06:54	06:08	05:42	05:46	06:13	06:46	07:18	
16:59		17:36	48 16:52 (22)	18:11	19:47	20:20	20:50	20:58	20:34	19:46	18:53	
6 07:47		07:27	16:05 (22)	06:46	06:53	06:07	05:41	05:47	06:14	06:47	07:19	
17:00		17:37	47 16:52 (22)	18:13	19:48	20:21	20:50	20:58	20:33	19:44	18:52	
7 07:47		07:25	16:05 (22)	06:44	06:51	06:06	05:41	05:47	06:15	06:48	07:20	
17:01		17:38	47 16:52 (22)	18:14	19:49	20:22	20:51	20:57	20:32	19:43	18:50	
8 07:47		07:24	16:06 (22)	07:43	06:49	06:05	05:41	05:48	06:16	06:49	07:21	
17:02		17:40	47 16:53 (22)	19:15	19:50	20:23	20:52	20:57	20:31	19:41	18:48	
9 07:47		07:23	16:05 (22)	07:41	06:48	06:03	05:41	05:49	06:17	06:50	07:23	
17:03		17:41	47 16:52 (22)	19:16	19:52	20:24	20:52	20:57	20:29	19:39	18:47	
10 07:46		07:22	16:06 (22)	07:39	06:46	06:02	05:40	05:49	06:18	06:51	07:24	
17:04		17:42	46 16:52 (22)	19:17	19:53	20:25	20:53	20:56	20:28	19:37	18:45	
11 07:46		07:20	16:07 (22)	07:38	06:44	06:01	05:40	05:50	06:19	06:52	07:25	
17:05		17:44	45 16:52 (22)	19:18	19:54	20:26	20:53	20:56	20:27	19:36	18:43	
12 07:46		07:19	16:07 (22)	07:36	06:43	06:00	05:40	05:51	06:21	06:53	07:26	
17:06		17:45	44 16:51 (22)	19:20	19:55	20:27	20:54	20:55	20:25	19:34	18:42	
13 07:45		07:18	16:08 (22)	07:34	06:41	05:59	05:40	05:52	06:22	06:54	07:27	
17:07		17:46	43 16:51 (22)	19:21	19:56	20:28	20:55	20:55	20:24	19:32	18:40	
14 07:45		07:16	16:09 (22)	07:32	06:39	05:58	05:40	05:52	06:23	06:55	07:28	
17:08		17:48	41 16:50 (22)	19:22	19:57	20:29	20:55	20:54	20:23	19:30	18:38	
15 07:45		16:18 (22)	07:15	16:09 (22)	07:31	06:38	05:57	05:40	05:53	06:24	06:57	
17:09	11	16:29 (22)	17:49	40 16:49 (22)	19:23	19:58	20:31	20:56	20:54	20:21	19:28	
16 07:44		16:15 (22)	07:14	16:10 (22)	07:29	06:36	05:56	05:40	05:54	06:25	06:58	
17:10	16	16:31 (22)	17:50	38 16:48 (22)	19:24	20:00	20:32	20:56	20:53	20:20	19:27	
17 07:44		16:14 (22)	07:12	16:11 (22)	07:27	06:35	05:55	05:40	05:55	06:26	06:59	
17:12	20	16:34 (22)	17:51	36 16:47 (22)	19:25	20:00	20:33	20:56	20:52	20:18	19:25	
18 07:43		16:12 (22)	07:11	16:13 (22)	07:26	06:33	05:54	05:40	05:56	06:27	07:00	
17:13	24	16:36 (22)	17:53	33 16:46 (22)	19:27	20:01	20:34	20:57	20:52	20:17	19:23	
19 07:43		16:11 (22)	07:09	16:15 (22)	07:24	06:31	05:53	05:40	05:57	06:28	07:01	
17:14	26	16:37 (22)	17:54	30 16:45 (22)	19:28	20:02	20:35	20:57	20:51	20:15	19:21	
20 07:42		16:11 (22)	07:08	16:16 (22)	07:22	06:30	05:52	05:40	05:57	06:29	07:02	
17:15	29	16:40 (22)	17:55	26 16:42 (22)	19:29	20:03	20:36	20:57	20:50	20:14	19:20	
21 07:41		16:10 (22)	07:07	16:19 (22)	07:20	06:28	05:51	05:40	05:58	06:30	07:03	
17:17	31	16:41 (22)	17:57	21 16:40 (22)	19:30	20:04	20:37	20:58	20:50	20:12	19:18	
22 07:41		16:09 (22)	07:05	16:22 (22)	07:19	06:27	05:50	05:41	05:59	06:31	07:04	
17:18	33	16:42 (22)	17:58	14 16:36 (22)	19:31	20:05	20:38	20:58	20:49	20:11	19:16	
23 07:40		16:08 (22)	07:04		07:17	06:25	05:49	05:41	06:00	06:32	07:05	
17:19	35	16:43 (22)	17:59		19:32	20:06	20:39	20:58	20:48	20:09	19:14	
24 07:39		16:08 (22)	07:02		07:15	06:24	05:49	05:41	06:01	06:33	07:06	
17:20	37	16:45 (22)	18:00		19:34	20:07	20:40	20:58	20:47	20:08	19:13	
25 07:38		16:07 (22)	07:00		07:13	06:22	05:48	05:41	06:02	06:34	07:07	
17:22	39	16:46 (22)	18:02		19:35	20:09	20:40	20:58	20:46	20:06	19:11	
26 07:38		16:07 (22)	06:59		07:12	06:21	05:47	05:42	06:03	06:35	07:08	
17:23	40	16:47 (22)	18:03		19:36	20:10	20:41	20:58	20:45	20:04	19:09	
27 07:37		16:06 (22)	06:57		07:10	06:19	05:46	05:42	06:04	06:36	07:09	
17:24	41	16:47 (22)	18:04		19:37	20:11	20:42	20:59	20:44	20:03	19:07	
28 07:36		16:06 (22)	06:56		07:08	06:18	05:46	05:42	06:05	06:37	07:10	
17:25	42	16:48 (22)	18:05		19:38	20:12	20:43	20:59	20:43	20:01	19:05	
29 07:35		16:06 (22)			07:06	06:16	05:45	05:43	06:06	06:39	07:12	
17:27	43	16:49 (22)			19:39	20:13	20:44	20:59	20:42	19:58	19:04	
30 07:34		16:05 (22)			07:05	06:15	05:44	05:43	06:07	06:40	07:13	
17:28	45	16:50 (22)			19:40	20:14	20:45	20:59	20:41	19:56	19:02	
31 07:33		16:05 (22)			07:03		05:44		06:08	06:41	07:49	
17:29	45	16:50 (22)			19:41		20:46		20:40	19:54	18:13	
Potential sun hours	294		295		370	401	452	457	463	431	375	343
Total, worst case		557	879								427	
Sun reduction		0.31	0.38								0.50	
Oper. time red.		1.00	1.00								1.00	
Wind dir. red.		0.69	0.69								0.69	
Total reduction		0.21	0.26								0.34	
Total, real		119	230								147	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker
			(WTG causing flicker last time)

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 20

Licensed user:

EDR

217 Montgomery St.

US-SYRACUSE, NY 13202

(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 83 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1280)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

		January		February		March		April		May		June		July		August		September		October		November		December					
	1	07:47		15:43 (22)	07:32		16:00 (22)	06:54		07:01		06:14		05:43		05:44		06:09		06:42		07:14		06:50		07:26		15:27 (22)	
		16:55	37	16:20 (22)	17:31	25	16:25 (22)	18:06		19:43		20:15		20:47		20:58		20:39		19:53		19:00		17:12		16:46	41	16:08 (22)	
	2	07:47		15:43 (22)	07:31		16:02 (22)	06:53		07:00		06:12		05:43		05:44		06:10		06:43		07:15		06:51		07:27		15:28 (22)	
		16:56	38	16:21 (22)	17:32	22	16:24 (22)	18:08		19:44		20:16		20:47		20:58		20:38		19:51		18:58		17:10		16:46	41	16:09 (22)	
	3	07:47		15:43 (22)	07:30		16:04 (22)	06:51		06:58		06:11		05:42		05:45		06:11		06:44		07:16		06:52		07:29		15:29 (22)	
		16:57	38	16:21 (22)	17:33	18	16:22 (22)	18:09		19:45		20:18		20:48		20:58		20:37		19:49		18:57		17:09		16:45	40	16:09 (22)	
	4	07:47		15:44 (22)	07:29		16:08 (22)	06:49		06:56		06:10		05:42		05:45		06:12		06:45		07:17		06:54		07:30		15:29 (22)	
		16:58	38	16:22 (22)	17:35	11	16:19 (22)	18:10		19:46		20:19		20:49		20:58		20:36		19:48		18:55		17:08		16:45	40	16:09 (22)	
	5	07:47		15:44 (22)	07:28		06:48	06:54		06:08		05:42		05:46		06:13		06:46		07:18		06:55		07:31		15:30 (22)			
		16:59	39	16:23 (22)	17:36		18:11	19:47		20:20		20:50		20:58		20:34		19:46		18:53		17:07		16:45		39	16:09 (22)		
	6	07:47		15:44 (22)	07:27		06:46	06:53		06:07		05:41		05:47		06:14		06:47		07:19		06:56		07:32		15:30 (22)			
		17:00	39	16:23 (22)	17:37		18:13	19:48		20:21		20:50		20:58		20:33		19:44		18:52		17:05		16:45		39	16:09 (22)		
	7	07:47		15:45 (22)	07:25		06:44	06:51		06:06		05:41		05:47		06:15		06:48		07:20		06:57		15:37 (22)		07:33		15:31 (22)	
		17:01	39	16:24 (22)	17:38		18:14	19:49		20:22		20:51		20:57		20:32		19:43		18:50		17:04	12	15:49 (22)		16:45	39	16:10 (22)	
	8	07:47		15:44 (22)	07:24		07:43	06:49		06:05		05:41		05:48		06:16		06:49		07:21		06:59		15:34 (22)		07:33		15:32 (22)	
		17:02	40	16:24 (22)	17:40		19:15	19:50		20:23		20:52		20:57		20:31		19:41		18:48		17:03	18	15:52 (22)		16:45	38	16:10 (22)	
	9	07:47		15:45 (22)	07:23		07:41	06:48		06:03		05:41		05:49		06:17		06:50		07:23		07:00		15:32 (22)		07:34		15:32 (22)	
		17:03	40	16:25 (22)	17:41		19:16	19:52		20:24		20:52		20:57		20:29		19:39		18:47		17:02	23	15:55 (22)		16:45	38	16:10 (22)	
	10	07:46		15:45 (22)	07:22		07:39	06:46		06:02		05:40		05:49		06:18		06:51		07:24		07:01		15:31 (22)		07:35		15:33 (22)	
		17:04	41	16:26 (22)	17:42		19:17	19:53		20:25		20:53		20:56		20:28		19:37		18:45		17:01	25	15:56 (22)		16:45	38	16:11 (22)	
	11	07:46		15:45 (22)	07:20		07:38	06:44		06:01		05:40		05:50		06:19		06:52		07:25		07:03		15:29 (22)		07:36		15:33 (22)	
		17:05	41	16:26 (22)	17:44		19:18	19:54		20:26		20:53		20:56		20:27		19:36		18:43		17:00	28	15:57 (22)		16:45	37	16:10 (22)	
	12	07:46		15:46 (22)	07:19		07:36	06:43		06:00		05:40		05:51		06:20		06:53		07:26		07:04		15:28 (22)		07:37		15:34 (22)	
		17:06	40	16:26 (22)	17:45		19:20	19:55		20:27		20:54		20:55		20:25		19:34		18:42		16:59	31	15:59 (22)		16:45	36	16:10 (22)	
	13	07:45		15:46 (22)	07:18		07:34	06:41		05:59		05:40		05:52		06:22		06:54		07:27		07:05		15:27 (22)		07:38		15:34 (22)	
		17:07	41	16:27 (22)	17:46		19:21	19:56		20:28		20:55		20:55		20:24		19:32		18:40		16:58	33	16:00 (22)		16:45	37	16:11 (22)	
	14	07:45		15:46 (22)	07:16		07:32	06:39		05:58		05:40		05:52		06:23		06:55		07:28		07:06		15:26 (22)		07:39		15:35 (22)	
		17:08	41	16:27 (22)	17:48		19:22	19:57		20:29		20:55		20:54		20:23		19:30		18:38		16:57	34	16:00 (22)		16:45	36	16:11 (22)	
	15	07:45		15:47 (22)	07:15		07:31	06:38		05:57		05:40		05:53		06:24		06:57		07:29		07:08		15:26 (22)		07:39		15:36 (22)	
		17:09	41	16:28 (22)	17:49		19:23	19:58		20:31		20:56		20:54		20:21		19:28		18:37		16:56	36	16:02 (22)		16:45	36	16:12 (22)	
	16	07:44		15:47 (22)	07:14		07:29	06:36		05:56		05:40		05:54		06:25		06:58		07:31		07:09		15:26 (22)		07:40		15:36 (22)	
		17:10	41	16:28 (22)	17:50		19:24	20:00		20:32		20:56		20:53		20:20		19:27		18:35		16:55	36	16:02 (22)		16:46	36	16:12 (22)	
	17	07:44		15:48 (22)	07:12		07:27	06:35		05:55		05:40		05:55		06:26		06:59		07:32		07:10		15:25 (22)		07:41		15:37 (22)	
		17:12	41	16:29 (22)	17:51		19:25	20:00		20:33		20:56		20:52		20:18		19:25		18:33		16:54	38	16:03 (22)		16:46	35	16:12 (22)	
	18	07:43		15:48 (22)	07:11		07:26	06:33		05:54		05:40		05:56		06:27		07:00		07:33		07:11		15:25 (22)		07:41		15:37 (22)	
		17:13	41	16:29 (22)	17:53		19:27	20:01		20:34		20:57		20:52		20:17		19:23		18:32		16:53	39	16:04 (22)		16:46	35	16:12 (22)	
	19	07:43		15:48 (22)	07:09		07:24	06:31		05:53		05:40		05:57		06:28		07:01		07:34		07:12		15:25 (22)		07:42		15:38 (22)	
		17:14	41	16:29 (22)	17:54		19:28	20:02		20:35		20:57		20:51		20:15		19:21		18:30		16:53	39	16:04 (22)		16:47	35	16:13 (22)	
	20	07:42		15:49 (22)	07:08		07:22	06:30		05:52		05:40		05:57		06:29		07:02		07:35		07:14		15:25 (22)		07:43		15:39 (22)	
		17:15	41	16:30 (22)	17:55		19:29	20:03		20:36		20:57		20:50		20:14		19:20		18:29		16:52	39	16:04 (22)		16:47	35	16:14 (22)	
	21	07:41		15:49 (22)	07:07		07:20	06:28		05:51		05:40		05:58		06:30		07:03		07:37		07:15		15:24 (22)		07:43		15:39 (22)	
		17:17	41	16:30 (22)	17:57		19:30	20:04		20:37		20:58		20:50		20:12		19:18		18:27		16:51	41	16:05 (22)		16:47	35	16:14 (22)	
	22	07:41		15:50 (22)	07:05		07:19	06:27		05:50		05:41		05:59		06:31		07:04		07:38		07:16		15:25 (22)		07:44		15:40 (22)	
		17:18	39	16:29 (22)	17:58		19:31	20:05		20:38		20:58		20:49		20:11		19:16		18:26		16:50	41	16:06 (22)		16:48	35	16:15 (22)	
	23	07:40		15:50 (22)	07:04		07:17	06:25		05:49		05:41		06:00		06:32		07:05		07:39		07:17		15:25 (22)		07:44		15:40 (22)	
		17:19	39	16:29 (22)	17:59		19:32	20:06		20:39		20:58		20:48		20:09		19:14		18:24		16:50	41	16:06 (22)		16:48	35	16:15 (22)	
	24	07:39		15:51 (22)	07:02		07:15	06:24		05:48		05:41		06:01		06:33		07:06		07:40		07:18		15:25 (22)		07:45		15:40 (22)	
		17:20	39	16:30 (22)	18:00		19:34	20:07		20:40		20:58		20:47		20:08		19:13		18:23		16:49	41	16:06 (22)		16:49	35	16:15 (22)	
	25	07:38		15:52 (22)	07:00		07:13	06:22		05:48		05:41		06:02		06:34		07:07		07:41		07:20		15:25 (22)		07:45		15:41 (22)	
		17:22	38	16:30 (22)	18:02		19:35	20:09		20:40		20:58		20:46		20:06		19:11		18:21		16:49	41	16:06 (22)		16:50	35	16:16 (22)	
	26	07:38		15:53 (22)	06:59		07:12	06:21		05:47		05:42		06:03		06:35		07:08		07:43		07:21		15:26 (22)		07:45		15:41 (22)	
		17:23	36	16:29 (22)	18:03		19:36	20:10		20:41		20:58		20:45		20:04		19:09		18:20		1							

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 21

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 84 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1281)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Cut in wind speed from power curve

	January	February	March	April	May		June		July		August	September	October	November	December			
1	07:47	07:32	06:54	07:01	06:14		05:43		06:17 (30)	05:44		06:23 (30)	06:09	06:42	07:14	06:50	07:26	
	16:55	17:31	18:06	19:43	20:15		20:47	35	06:52 (30)	20:58	35	06:58 (30)	20:39	19:53	19:00	17:12	16:46	
2	07:47	07:31	06:53	07:00	06:12		05:43		06:17 (30)	05:44		06:24 (30)	06:10	06:43	07:15	06:51	07:27	
	16:56	17:32	18:08	19:44	20:16		20:47	35	06:52 (30)	20:58	34	06:58 (30)	20:38	19:51	18:59	17:10	16:46	
3	07:47	07:30	06:51	06:58	06:11		05:42		06:17 (30)	05:45		06:23 (30)	06:11	06:44	07:16	06:53	07:29	
	16:57	17:33	18:09	19:45	20:18		20:48	36	06:53 (30)	20:58	35	06:58 (30)	20:37	19:49	18:57	17:09	16:45	
4	07:47	07:29	06:49	06:56	06:10		05:42		06:17 (30)	05:45		06:24 (30)	06:12	06:45	07:17	06:54	07:30	
	16:58	17:35	18:10	19:46	20:19		20:49	35	06:52 (30)	20:58	35	06:59 (30)	20:36	19:48	18:55	17:08	16:45	
5	07:47	07:28	06:48	06:54	06:08		05:42		06:17 (30)	05:46		06:23 (30)	06:13	06:46	07:18	06:55	07:31	
	16:59	17:36	18:11	19:47	20:20		20:50	35	06:52 (30)	20:58	35	06:58 (30)	20:34	19:46	18:53	17:07	16:45	
6	07:47	07:27	06:46	06:53	06:07		05:41		06:18 (30)	05:47		06:24 (30)	06:14	06:47	07:19	06:56	07:32	
	17:00	17:37	18:13	19:48	20:21		20:50	35	06:53 (30)	20:58	35	06:59 (30)	20:33	19:44	18:52	17:05	16:45	
7	07:47	07:25	06:44	06:51	06:06		05:41		06:18 (30)	05:47		06:23 (30)	06:15	06:48	07:20	06:58	07:33	
	17:01	17:38	18:14	19:49	20:22		20:51	35	06:53 (30)	20:57	36	06:59 (30)	20:32	19:43	18:50	17:04	16:45	
8	07:47	07:24	07:43	06:49	06:05		05:41		06:18 (30)	05:48		06:24 (30)	06:16	06:49	07:22	06:59	07:33	
	17:02	17:40	19:15	19:51	20:23		20:52	35	06:53 (30)	20:57	35	06:59 (30)	20:31	19:41	18:48	17:03	16:45	
9	07:47	07:23	07:41	06:48	06:03		05:41		06:18 (30)	05:49		06:24 (30)	06:17	06:50	07:23	07:00	07:34	
	17:03	17:41	19:16	19:52	20:24		20:52	35	06:53 (30)	20:57	36	07:00 (30)	20:29	19:39	18:47	17:02	16:45	
10	07:46	07:22	07:39	06:46	06:02		05:40		06:18 (30)	05:49		06:24 (30)	06:18	06:51	07:24	07:01	07:35	
	17:04	17:42	19:17	19:53	20:25		20:53	35	06:53 (30)	20:56	35	06:59 (30)	20:28	19:37	18:45	17:01	16:45	
11	07:46	07:20	07:38	06:44	06:01		05:40		06:19 (30)	05:50		06:24 (30)	06:19	06:52	07:25	07:03	07:36	
	17:05	17:44	19:19	19:54	20:26		20:54	35	06:54 (30)	20:56	36	07:00 (30)	20:27	19:36	18:43	17:00	16:45	
12	07:46	07:19	07:36	06:43	06:00		05:40		06:19 (30)	05:51		06:25 (30)	06:21	06:53	07:26	07:04	07:37	
	17:06	17:45	19:20	19:55	20:27		20:54	35	06:54 (30)	20:55	35	07:00 (30)	20:25	19:34	18:42	16:59	16:45	
13	07:45	07:18	07:34	06:41	05:59		06:29 (30)	05:40	06:19 (30)	05:52		06:25 (30)	06:22	06:54	07:27	07:05	07:38	
	17:07	17:46	19:21	19:56	20:28	9	06:38 (30)	20:55	35	06:54 (30)	20:55	35	07:00 (30)	20:24	19:32	18:40	16:58	16:45
14	07:45	07:16	07:33	06:39	05:58		06:26 (30)	05:40	06:20 (30)	05:52		06:25 (30)	06:23	06:55	07:28	07:06	07:39	
	17:08	17:48	19:22	19:57	20:30	15	06:41 (30)	20:55	34	06:54 (30)	20:54	35	07:00 (30)	20:23	19:30	18:38	16:57	16:45
15	07:45	07:15	07:31	06:38	05:57		06:24 (30)	05:40	06:20 (30)	05:53		06:25 (30)	06:24	06:57	07:30	07:08	07:39	
	17:09	17:49	19:23	19:58	20:31	19	06:43 (30)	20:56	34	06:54 (30)	20:54	35	07:00 (30)	20:21	19:28	18:37	16:56	16:45
16	07:44	07:14	07:29	06:36	05:56		06:23 (30)	05:40	06:20 (30)	05:54		06:26 (30)	06:25	06:58	07:31	07:09	07:40	
	17:10	17:50	19:24	20:00	20:32	21	06:44 (30)	20:56	34	06:54 (30)	20:53	34	07:00 (30)	20:20	19:27	18:35	16:55	16:46
17	07:44	07:12	07:27	06:35	05:55		06:21 (30)	05:40	06:20 (30)	05:55		06:26 (30)	06:26	06:59	07:32	07:10	07:41	
	17:12	17:51	19:26	20:00	20:33	24	06:45 (30)	20:56	35	06:55 (30)	20:52	34	07:00 (30)	20:18	19:25	18:33	16:54	16:46
18	07:43	07:11	07:26	06:33	05:54		06:20 (30)	05:40	06:20 (30)	05:56		06:27 (30)	06:27	07:00	07:33	07:11	07:41	
	17:13	17:53	19:27	20:01	20:34	26	06:46 (30)	20:57	35	06:55 (30)	20:52	33	07:00 (30)	20:17	19:23	18:32	16:53	16:46
19	07:43	07:09	07:24	06:31	05:53		06:19 (30)	05:40	06:21 (30)	05:57		06:26 (30)	06:28	07:01	07:34	07:12	07:42	
	17:14	17:54	19:28	20:02	20:35	28	06:47 (30)	20:57	34	06:55 (30)	20:51	33	06:59 (30)	20:15	19:21	18:30	16:53	16:47
20	07:42	07:08	07:22	06:30	05:52		06:19 (30)	05:40	06:21 (30)	05:57		06:27 (30)	06:29	07:02	07:35	07:14	07:43	
	17:15	17:55	19:29	20:03	20:36	28	06:47 (30)	20:57	34	06:55 (30)	20:50	32	06:59 (30)	20:14	19:20	18:29	16:52	16:47
21	07:41	07:07	07:20	06:28	05:51		06:18 (30)	05:40	06:21 (30)	05:58		06:27 (30)	06:30	07:03	07:37	07:15	07:43	
	17:17	17:57	19:30	20:04	20:37	30	06:48 (30)	20:58	34	06:55 (30)	20:50	32	06:59 (30)	20:12	19:18	18:27	16:51	16:47
22	07:41	07:05	07:19	06:27	05:50		06:18 (30)	05:41	06:22 (30)	05:59		06:28 (30)	06:31	07:04	07:38	07:16	07:44	
	17:18	17:58	19:31	20:05	20:38	31	06:49 (30)	20:58	34	06:56 (30)	20:49	31	06:59 (30)	20:11	19:16	18:26	16:50	16:48
23	07:40	07:04	07:17	06:25	05:49		06:18 (30)	05:41	06:22 (30)	06:00		06:29 (30)	06:32	07:05	07:39	07:17	07:44	
	17:19	17:59	19:32	20:06	20:39	31	06:49 (30)	20:58	34	06:56 (30)	20:48	29	06:58 (30)	20:09	19:14	18:24	16:50	16:48
24	07:39	07:02	07:15	06:24	05:49		06:17 (30)	05:41	06:22 (30)	06:01		06:30 (30)	06:33	07:06	07:40	07:18	07:45	
	17:20	18:00	19:34	20:07	20:40	33	06:50 (30)	20:58	34	06:56 (30)	20:47	28	06:58 (30)	20:08	19:13	18:23	16:49	16:49
25	07:38	07:00	07:13	06:22	05:48		06:16 (30)	05:41	06:21 (30)	06:02		06:30 (30)	06:34	07:07	07:41	07:20	07:45	
	17:22	18:02	19:35	20:09	20:40	34	06:50 (30)	20:58	35	06:56 (30)	20:46	27	06:57 (30)	20:06	19:11	18:21	16:49	16:50
26	07:38	06:59	07:12	06:21	05:47		06:17 (30)	05:42	06:22 (30)	06:03		06:31 (30)	06:35	07:08	07:43	07:21	07:45	
	17:23	18:03	19:36	20:10	20:41	34	06:51 (30)	20:58	35	06:57 (30)	20:45	25	06:56 (30)	20:04	19:09	18:20	16:48	16:50
27	07:37	06:57	07:10	06:19	05:46		06:16 (30)	05:42	06:22 (30)	06:04		06:32 (30)	06:36	07:09	07:44	07:22	07:46	
	17:24	18:04	19:37	20:11	20:42	35	06:51 (30)	20:59	34	06:56 (30)	20:44	23	06:55 (30)	20:03	19:07	18:18	16:48	16:51
28	07:36	06:56	07:08	06:18	05:46		06:17 (30)	05:42	06:23 (30)	06:05		06:34 (30)	06:38	07:10	07:45	07:23	07:46	
	17:25	18:05	19:38	20:12	20:43	34	06:51 (30)	20:59	34	06:57 (30)	20:43	20	06:54 (30)	20:01	19:05	18:17	16:47	16:52
29	07:35		07:06	06:16	05:45		06:16 (30)	05:43	06:23 (30)	06:06		06:35 (30)	06:39	07:12	07:46	07:24	07:46	
	17:27		19:39	20:13	20:44	35	06:51 (30)	20:59	34	06:57 (30)	20:42	18	06:53 (30)	19:58	19:04	18:16	16:47	16:52
30	07:34		07:05	06:15	05:44		06:17 (30)	05:43	06:23 (30)	06:07		06:38 (30)	06:40	07:13	07:48	07:25	07:47	
	17:28		19:40	20:14	20:45	35	06:52 (30)	20:59	35	06:58 (30)	20:41	12	06:50 (30)	19:56	19:02	18:14	16:46	16:53
31	07:33		07:03		05:44		06:17 (30)			06:08		06:41 (30)	06:41		07:49		07:47	
	17:29		19:41		20:46	35	06:52 (30)			20:40		6	06:47 (30)	19:54		18:13		16:54
Potential sun hours	294	295	370	401	452		457		463		431	375	343	294		283		
Total, worst case					537		1039		944									
Sun reduction					0.56		0.65		0.67									
Oper. time red.					1.00		1.00		1.00									
Wind dir. red.					0.68		0.68		0.68									
Total reduction					0.38		0.44		0.45									
Total, real					204		457		428									

Project:

2015-08-31_Arkwright Summit_SFA

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Licensed user:

EDR

217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar

Calculation: 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 90 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1287)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117		541	386	285 8,759

Idle start wind speed: Cut in wind speed from power curve

	January	February	March			April			May	June	July	August			September			October	November	December	
1	07:47	07:32	06:54			07:01		18:19 (22)	06:14	05:43	05:44	06:09		06:42		18:19 (22)	07:14	06:50	07:26		
	16:55	17:31	18:06			19:43	49	19:08 (22)	20:15	20:47	20:58	20:39		19:53	41	19:00 (22)	19:00	17:12	16:46		
2	07:47	07:31	06:53			07:00		18:18 (22)	06:12	05:43	05:44	06:10		06:43		18:18 (22)	07:15	06:51	07:27		
	16:56	17:32	18:08			19:44	49	19:07 (22)	20:16	20:47	20:58	20:38		19:51	42	19:00 (22)	18:58	17:10	16:46		
3	07:47	07:30	06:51			06:58		18:18 (22)	06:11	05:42	05:45	06:11		06:44		18:16 (22)	07:16	06:52	07:29		
	16:57	17:33	18:09			19:45	49	19:07 (22)	20:17	20:48	20:58	20:37		19:49	45	19:01 (22)	18:57	17:09	16:45		
4	07:47	07:29	06:49			06:56		18:17 (22)	06:10	05:42	05:45	06:12		06:45		18:15 (22)	07:17	06:54	07:30		
	16:58	17:35	18:10			19:46	49	19:06 (22)	20:19	20:49	20:58	20:36		19:48	46	19:01 (22)	18:55	17:08	16:45		
5	07:47	07:28	06:48			06:54		18:18 (22)	06:08	05:42	05:46	06:13		06:46		18:15 (22)	07:18	06:55	07:31		
	16:59	17:36	18:11			19:47	48	19:06 (22)	20:20	20:50	20:58	20:34		19:46	46	19:01 (22)	18:53	17:07	16:45		
6	07:47	07:27	06:46			06:53		18:18 (22)	06:07	05:41	05:47	06:14		06:47		18:14 (22)	07:19	06:56	07:32		
	17:00	17:37	18:13			19:48	47	19:05 (22)	20:21	20:50	20:58	20:33		19:44	47	19:01 (22)	18:52	17:05	16:45		
7	07:47	07:25	06:44			06:51		18:17 (22)	06:06	05:41	05:47	06:15		06:48		18:13 (22)	07:20	06:57	07:33		
	17:01	17:38	18:14			19:49	47	19:04 (22)	20:22	20:51	20:57	20:32		19:43	48	19:01 (22)	18:50	17:04	16:45		
8	07:47	07:24	07:43			06:49		18:18 (22)	06:05	05:41	05:48	06:16		06:49		18:12 (22)	07:21	06:59	07:33		
	17:02	17:40	19:15			19:50	46	19:04 (22)	20:23	20:52	20:57	20:31		19:41	49	19:01 (22)	18:48	17:03	16:45		
9	07:47	07:23	07:41			06:48		18:18 (22)	06:03	05:41	05:49	06:17		06:50		18:12 (22)	07:23	07:00	07:34		
	17:03	17:41	19:16			19:52	45	19:03 (22)	20:24	20:52	20:57	20:29		19:39	49	19:01 (22)	18:47	17:02	16:45		
10	07:46	07:22	07:39			06:46		18:19 (22)	06:02	05:40	05:49	06:18		06:51		18:11 (22)	07:24	07:01	07:35		
	17:04	17:42	19:17			19:53	42	19:01 (22)	20:25	20:53	20:56	20:28		19:37	49	19:00 (22)	18:45	17:01	16:45		
11	07:46	07:20	07:38			06:44		18:20 (22)	06:01	05:40	05:50	06:19		06:52		18:11 (22)	07:25	07:03	07:36		
	17:05	17:44	19:18			19:54	41	19:01 (22)	20:26	20:53	20:56	20:27		19:36	49	19:00 (22)	18:43	17:00	16:45		
12	07:46	07:19	07:36			06:43		18:20 (22)	06:00	05:40	05:51	06:21		06:53		18:11 (22)	07:26	07:04	07:37		
	17:06	17:45	19:20			19:55	39	18:59 (22)	20:27	20:54	20:55	20:25		19:34	48	18:59 (22)	18:42	16:59	16:45		
13	07:45	07:18	07:34			06:41		18:21 (22)	05:59	05:40	05:52	06:22		06:54		18:10 (22)	07:27	07:05	07:38		
	17:07	17:46	19:21			19:56	37	18:58 (22)	20:28	20:55	20:55	20:24		19:32	49	18:59 (22)	18:40	16:58	16:45		
14	07:45	07:16	07:32			06:39		18:23 (22)	05:58	05:40	05:52	06:23		06:55		18:10 (22)	07:28	07:06	07:39		
	17:08	17:48	19:22			19:57	34	18:57 (22)	20:29	20:55	20:54	20:23		19:30	48	18:58 (22)	18:38	16:57	16:45		
15	07:45	07:15	07:31			06:38		18:24 (22)	05:57	05:40	05:53	06:24		06:57		18:10 (22)	07:29	07:07	07:39		
	17:09	17:49	19:23			19:58	30	18:54 (22)	20:31	20:56	20:54	20:21		19:28	47	18:57 (22)	18:37	16:56	16:45		
16	07:44	07:14	07:29			06:36		18:26 (22)	05:56	05:40	05:54	06:25		06:58		18:11 (22)	07:31	07:09	07:40		
	17:10	17:50	19:24			20:00	27	18:53 (22)	20:32	20:56	20:53	20:20		19:27	45	18:56 (22)	18:35	16:55	16:46		
17	07:44	07:12	07:27			06:35		18:28 (22)	05:55	05:40	05:55	06:26		06:59		18:11 (22)	07:32	07:10	07:41		
	17:12	17:51	19:25			20:00	22	18:50 (22)	20:33	20:56	20:52	20:18		19:25	44	18:55 (22)	18:33	16:54	16:46		
18	07:43	07:11	07:26	8	18:43 (22)	06:33		18:30 (22)	05:54	05:40	05:56	06:27		07:00		18:11 (22)	07:33	07:11	07:41		
	17:13	17:53	19:27			20:01	16	18:51 (22)	20:34	20:57	20:52	20:17		19:23	42	18:53 (22)	18:32	16:53	16:46		
19	07:43	07:09	07:24			06:31		18:38 (22)	05:53	05:40	05:57	06:28		07:01		18:12 (22)	07:34	07:12	07:42		
	17:14	17:54	19:28	19	18:56 (22)	20:02	1	18:39 (22)	20:35	20:57	20:51	20:15		19:21	40	18:52 (22)	18:30	16:53	16:47		
20	07:42	07:08	07:22			06:30			05:52	05:40	05:57	06:29		07:02		18:13 (22)	07:35	07:14	07:43		
	17:15	17:55	19:29	25	18:59 (22)	20:03			20:36	20:57	20:50	20:14		19:20	37	18:50 (22)	18:29	16:52	16:47		
21	07:41	07:07	07:20			06:28			05:51	05:40	05:58	06:30		07:03		18:14 (22)	07:37	07:15	07:43		
	17:17	17:57	19:30	30	19:01 (22)	20:04			20:37	20:58	20:50	20:12		19:18	34	18:48 (22)	18:27	16:51	16:47		
22	07:41	07:05	07:19			06:27			05:50	05:41	05:59	06:31		07:04		18:15 (22)	07:38	07:16	07:44		
	17:18	17:58	19:31	34	19:03 (22)	20:05			20:38	20:58	20:49	20:11		19:16	31	18:46 (22)	18:26	16:50	16:48		
23	07:40	07:04	07:17			06:25			05:49	05:41	06:00	06:32		07:05		18:17 (22)	07:39	07:17	07:44		
	17:19	17:59	19:32	36	19:03 (22)	20:06			20:39	20:58	20:48	20:09		19:14	27	18:44 (22)	18:24	16:50	16:48		
24	07:39	07:02	07:15			06:24			05:49	05:41	06:01	06:33				18:19 (22)	07:40	07:18	07:45		
	17:20	18:00	19:34	39	19:05 (22)	20:07			20:40	20:58	20:47	20:08	6	18:45 (22)	19:13	21	18:40 (22)	18:23	16:49		
25	07:38	07:00	07:13			06:22			05:48	05:41	06:02	06:34				18:34 (22)	07:07		07:20	07:45	
	17:22	18:02	19:35	42	19:06 (22)	20:09			20:40	20:58	20:46	20:06	16	18:50 (22)	19:11	13	18:36 (22)	18:21	16:49	16:50	
26	07:38	06:59	07:12			06:21			05:47	05:42	06:03	06:35				18:30 (22)	07:08		07:21	07:45	
	17:23	18:03	19:36	43	19:06 (22)	20:10			20:41	20:58	20:45	20:04	23	18:53 (22)	19:09		18:20	16:48	16:50		
27	07:37	06:57	07:10			06:19			05:46	05:42	06:04	06:36				18:28 (22)	07:09		07:44	07:22	07:46
	17:24	18:04	19:37	45	19:06 (22)	20:11			20:42	20:59	20:44	20:03	27	18:55 (22)	19:07		18:18	16:48	16:51		
28	07:36	06:56	07:08			06:18			05:46	05:42	06:05	06:37				18:25 (22)	07:10		07:45	07:23	07:46
	17:25	18:05	19:38	46	19:07 (22)	20:12			20:43	20:59	20:43	20:01	31	18:56 (22)	19:05		18:17	16:47	16:52		
29	07:35		07:06			06:16			05:45	05:43	06:06	06:39				18:24 (22)	07:12		07:46	07:24	07:46
	17:27		19:39	47	19:07 (22)	20:13			20:44	20:59	20:42	19:58	34	18:58 (22)	19:04		18:16	16:47	16:52		
30	07:34		07:05			06:15			05:44	05:43	06:07	06:40				18:22 (22)	07:13		07:48	07:25	07:47
	17:28		19:40	48	19:07 (22)	20:14			20:45	20:59	20:41	19:56	37	18:59 (22)	19:02		18:14	16:46	16:53		
31	07:33		07:03						05:44		06:08	06:41				18:20 (22)		07:49		07:47	
	17:29		19:41	49	19:07 (22)				20:46		20:40	19:54	39	18:59 (22)			18:13		16:54		
Potential sun hours	294	295	370			401			452	457	463	431		375			343	294	283		
Total, worst case						511			718				213		1037						
Sun reduction						0.46			0.51				0.64		0.57						
Oper. time red.						1.00			1.00				1.00		1.00						
Wind dir. red.						0.63			0.63				0.63		0.63						
Total reduction						0.29			0.32				0.40		0.36						
Total, real						147			229</												

Project:

2015-08-31_Arkwright Summit_SFA

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EDR

217 Montgomery St.

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Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 91 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1288)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December			
1	07:47 16:55	07:32 17:31	06:54 18:06	07:01 19:43	18:02 (22) 18:55 (22)	06:14 20:15	05:43 20:47	05:44 20:58	06:09 20:39	06:42 19:53	18:08 (22) 18:42 (22)	07:14 19:00	18:01 (22) 18:25 (22)	06:50 17:12	07:26 16:46
2	07:47 16:56	07:31 17:32	06:53 18:08	07:00 19:44	18:02 (22) 18:54 (22)	06:12 20:16	05:43 20:47	05:44 20:58	06:10 20:38	19:53 19:51	18:06 (22) 18:43 (22)	07:15 18:58	18:04 (22) 18:21 (22)	06:51 17:10	07:27 16:46
3	07:47 16:57	07:30 17:33	06:51 18:09	06:58 19:45	18:02 (22) 18:53 (22)	06:11 20:18	05:42 20:48	05:45 20:58	06:11 20:37	06:44 19:49	18:05 (22) 18:44 (22)	07:16 18:57		06:52 17:09	07:29 16:45
4	07:47 16:58	07:29 17:35	06:49 18:10	06:56 19:46	18:02 (22) 18:52 (22)	06:10 20:19	05:42 20:49	05:45 20:58	06:12 20:36	06:45 19:48	18:03 (22) 18:45 (22)	07:17 18:55		06:54 17:08	07:30 16:45
5	07:47 16:59	07:28 17:36	06:48 18:11	06:54 19:47	18:03 (22) 18:52 (22)	06:08 20:20	05:42 20:50	05:46 20:58	06:13 20:34	06:46 19:46	18:01 (22) 18:46 (22)	07:18 18:53		06:55 17:07	07:31 16:45
6	07:47 17:00	07:27 17:37	06:46 18:13	06:53 19:48	18:04 (22) 18:50 (22)	06:07 20:21	05:41 20:50	05:47 20:58	06:14 20:33	06:47 19:44	18:00 (22) 18:46 (22)	07:19 18:52		06:56 17:05	07:32 16:45
7	07:47 17:01	07:25 17:38	06:44 18:14	06:51 19:49	18:04 (22) 18:49 (22)	06:06 20:22	05:41 20:51	05:47 20:57	06:15 20:32	06:48 19:43	17:59 (22) 18:47 (22)	07:20 18:50		06:57 17:04	07:33 16:45
8	07:47 17:02	07:24 17:40	07:43 19:15	06:49 19:50	18:06 (22) 18:48 (22)	06:05 20:23	05:41 20:52	05:48 20:57	06:16 20:31	06:49 19:41	17:57 (22) 18:47 (22)	07:21 18:48		06:59 17:03	07:33 16:45
9	07:47 17:03	07:23 17:41	07:41 19:16	06:48 19:52	18:07 (22) 18:46 (22)	06:03 20:24	05:41 20:52	05:49 20:57	06:17 20:29	06:50 19:39	17:56 (22) 18:47 (22)	07:23 18:47		07:00 17:02	07:34 16:45
10	07:46 17:04	07:22 17:42	07:39 19:17	06:46 19:53	18:07 (22) 18:44 (22)	06:02 20:25	05:40 20:53	05:49 20:56	06:18 20:28	06:51 19:37	17:55 (22) 18:47 (22)	07:24 18:45		07:01 17:01	07:35 16:45
11	07:46 17:05	07:20 17:44	07:38 19:18	06:44 19:54	18:10 (22) 18:43 (22)	06:01 20:26	05:40 20:53	05:50 20:56	06:19 20:27	06:52 19:36	17:54 (22) 18:47 (22)	07:25 18:43		07:03 17:00	07:36 16:45
12	07:46 17:06	07:19 17:45	07:36 19:20	06:43 19:55	18:11 (22) 18:40 (22)	06:00 20:27	05:40 20:54	05:51 20:55	06:21 20:25	06:53 19:34	17:54 (22) 18:47 (22)	07:26 18:42		07:04 16:59	07:37 16:45
13	07:45 17:07	07:18 17:46	07:34 19:21	06:41 19:56	18:13 (22) 18:37 (22)	05:59 20:28	05:40 20:55	05:52 20:55	06:22 20:24	06:54 19:32	17:53 (22) 18:47 (22)	07:27 18:40		07:05 16:58	07:38 16:45
14	07:45 17:08	07:16 17:48	07:32 19:22	06:39 19:57	18:16 (22) 18:34 (22)	05:58 20:29	05:40 20:55	05:52 20:54	06:23 20:23	06:55 19:30	17:52 (22) 18:47 (22)	07:28 18:38		07:06 16:57	07:39 16:45
15	07:45 17:09	07:15 17:49	07:31 19:23	06:38 19:58	18:15 (22) 18:51 (22)	05:57 20:31	05:40 20:56	05:53 20:54	06:24 20:21	06:57 19:28	17:52 (22) 18:46 (22)	07:29 18:37		07:08 16:56	07:40 16:45
16	07:44 17:10	07:14 17:50	07:29 19:24	06:36 20:00	18:13 (22) 18:53 (22)	05:56 20:32	05:40 20:56	05:54 20:53	06:25 20:20	06:58 19:27	17:51 (22) 18:46 (22)	07:31 18:35		07:09 16:55	07:40 16:46
17	07:44 17:12	07:12 17:51	07:27 19:25	06:35 20:00	18:11 (22) 18:54 (22)	05:55 20:33	05:40 20:56	05:55 20:52	06:26 20:18	06:59 19:25	17:51 (22) 18:45 (22)	07:32 18:33		07:10 16:54	07:41 16:46
18	07:43 17:13	07:11 17:53	07:26 19:27	06:33 20:01	18:10 (22) 18:54 (22)	05:54 20:34	05:40 20:57	05:56 20:52	06:27 20:17	07:00 19:23	17:51 (22) 18:45 (22)	07:33 18:32		07:11 16:53	07:41 16:46
19	07:43 17:14	07:09 17:54	07:24 19:28	06:31 20:02	18:08 (22) 18:55 (22)	05:40 20:35	05:40 20:57	05:57 20:51	06:28 20:15	07:01 19:21	17:51 (22) 18:44 (22)	07:34 18:30		07:12 16:53	07:42 16:47
20	07:42 17:15	07:08 17:55	07:22 19:29	06:30 20:03	18:08 (22) 18:56 (22)	05:40 20:36	05:40 20:57	05:57 20:50	06:29 20:14	07:02 19:20	17:50 (22) 18:43 (22)	07:35 18:29		07:14 16:52	07:43 16:47
21	07:41 17:17	07:07 17:57	07:20 19:30	06:28 20:04	18:06 (22) 18:57 (22)	05:40 20:37	05:40 20:58	05:58 20:50	06:30 20:12	07:03 19:18	17:50 (22) 18:42 (22)	07:37 18:27		07:15 16:51	07:43 16:47
22	07:41 17:18	07:05 17:58	07:19 19:31	06:27 20:05	18:05 (22) 18:57 (22)	05:41 20:38	05:41 20:58	05:59 20:49	06:31 20:12	07:04 19:16	17:51 (22) 18:41 (22)	07:38 18:26		07:16 16:50	07:44 16:48
23	07:40 17:19	07:04 17:59	07:17 19:32	06:25 20:06	18:04 (22) 18:57 (22)	05:49 20:39	05:41 20:58	06:00 20:48	06:32 20:09	07:05 19:14	17:51 (22) 18:40 (22)	07:39 18:24		07:17 16:50	07:44 16:48
24	07:39 17:20	07:02 18:00	07:15 19:34	06:24 20:07	18:04 (22) 18:58 (22)	05:49 20:40	05:41 20:58	06:01 20:47	06:33 20:08	07:06 19:13	17:51 (22) 18:39 (22)	07:40 18:23		07:18 16:49	07:45 16:49
25	07:38 17:22	07:00 18:02	07:13 19:35	06:22 20:09	18:03 (22) 18:57 (22)	05:48 20:40	05:41 20:58	06:02 20:46	06:34 20:06	07:07 19:11	17:52 (22) 18:37 (22)	07:41 18:21		07:20 16:49	07:45 16:50
26	07:38 17:23	06:59 18:03	07:12 19:36	06:21 20:10	18:03 (22) 18:57 (22)	05:47 20:41	05:42 20:58	06:03 20:45	06:35 20:04	07:08 19:09	17:53 (22) 18:37 (22)	07:43 18:20		07:21 16:48	07:45 16:50
27	07:37 17:24	06:57 18:04	07:10 19:37	06:19 20:11	18:02 (22) 18:57 (22)	05:46 20:42	05:42 20:59	06:04 20:44	06:36 20:03	07:09 19:07	17:54 (22) 18:35 (22)	07:44 18:18		07:22 16:48	07:46 16:51
28	07:36 17:25	06:56 18:05	07:08 19:38	06:18 20:12	18:02 (22) 18:57 (22)	05:46 20:43	05:42 20:59	06:05 20:43	06:37 20:01	18:23 (22) 18:30 (22)	17:55 (22) 18:33 (22)	07:45 18:17		07:23 16:47	07:46 16:52
29	07:35 17:27	07:06 19:39	07:06 19:39	06:16 20:13	18:02 (22) 18:56 (22)	05:45 20:44	05:43 20:59	06:06 20:42	06:39 19:58	18:17 (22) 18:35 (22)	17:57 (22) 18:31 (22)	07:46 18:16		07:24 16:47	07:46 16:52
30	07:34 17:28	07:05 19:40	07:05 19:40	06:15 20:14	18:02 (22) 18:56 (22)	05:44 20:45	05:43 20:59	06:07 20:41	06:40 19:56	18:14 (22) 18:38 (22)	17:59 (22) 18:28 (22)	07:48 18:14		07:25 16:46	07:47 16:53
31	07:33 17:29	07:03 19:41	07:03 19:41	06:15 20:14	18:01 (22) 18:55 (22)	05:44 20:46	05:43 20:59	06:08 20:40	06:41 19:54	18:11 (22) 18:40 (22)	17:59 (22) 18:28 (22)	07:49 18:13		07:26 16:54	07:47 16:54
Potential sun hours	294	295	370	401	452	457	463	431	375	343			294	283	
Total, worst case			940	574	574			78	1412	41					
Sun reduction			0.46	0.51	0.51			0.64	0.57	0.50					
Oper. time red.			1.00	1.00	1.00			1.00	1.00	1.00					
Wind dir. red.			0.63	0.63	0.63			0.63	0.63	0.63					
Total reduction			0.29	0.32	0.32			0.40	0.36	0.32					
Total, real			272	184				31	507	13					

Project:

2015-08-31_Arkwright Summit_SFA

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US-SYRACUSE, NY 13202

(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 92 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1289)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	January	February	March		April	May	June	July	August	September		October		November	December	
1	07:47	07:32	06:54		16:51 (22)	07:01	06:14	05:43	05:44	06:09	06:42	07:14		17:22 (22)	06:50	07:26
	16:55	17:31	18:06	41	17:32 (22)	19:43	20:15	20:47	20:58	20:39	19:53	19:00	53	18:15 (22)	17:12	16:46
2	07:47	07:31	06:53		16:50 (22)	07:00	06:12	05:43	05:44	06:10	06:43	07:15		17:22 (22)	06:51	07:27
	16:56	17:32	18:08	42	17:32 (22)	19:44	20:16	20:47	20:58	20:38	19:51	18:58	52	18:14 (22)	17:10	16:46
3	07:47	07:30	06:51		16:49 (22)	06:58	06:11	05:42	05:45	06:11	06:44	07:16		17:21 (22)	06:52	07:29
	16:57	17:33	18:09	45	17:34 (22)	19:45	20:18	20:48	20:58	20:37	19:49	18:57	53	18:14 (22)	17:09	16:45
4	07:47	07:29	06:49		16:48 (22)	06:56	06:10	05:42	05:45	06:12	06:45	07:17		17:21 (22)	06:54	07:30
	16:58	17:35	18:10	46	17:34 (22)	19:46	20:19	20:49	20:58	20:36	19:48	18:55	52	18:13 (22)	17:08	16:45
5	07:47	07:28	06:48		16:46 (22)	06:54	06:08	05:42	05:46	06:13	06:46	07:18		17:21 (22)	06:55	07:31
	16:59	17:36	18:11	48	17:34 (22)	19:47	20:20	20:50	20:58	20:34	19:46	18:53	51	18:12 (22)	17:07	16:45
6	07:47	07:27	06:46		16:46 (22)	06:53	06:07	05:41	05:47	06:14	06:47	07:19		17:22 (22)	06:56	07:32
	17:00	17:37	18:13	49	17:35 (22)	19:48	20:21	20:50	20:58	20:33	19:44	18:52	50	18:12 (22)	17:05	16:45
7	07:47	07:25	06:44		16:45 (22)	06:51	06:06	05:41	05:47	06:15	06:48	07:20		17:22 (22)	06:57	07:33
	17:01	17:38	18:14	50	17:35 (22)	19:49	20:22	20:51	20:57	20:32	19:43	18:50	49	18:11 (22)	17:04	16:45
8	07:47	07:24	07:43		17:44 (22)	06:49	06:05	05:41	05:48	06:16	06:49	07:21		17:22 (22)	06:59	07:33
	17:02	17:40	19:15	51	18:35 (22)	19:50	20:23	20:52	20:57	20:31	19:41	18:48	48	18:10 (22)	17:03	16:45
9	07:47	07:23	07:41		17:44 (22)	06:48	06:03	05:41	05:49	06:17	06:50	07:23		17:22 (22)	07:00	07:34
	17:03	17:41	19:16	52	18:36 (22)	19:52	20:24	20:52	20:57	20:29	19:39	18:47	47	18:09 (22)	17:02	16:45
10	07:46	07:22	07:39		17:44 (22)	06:46	06:02	05:40	05:49	06:18	06:51	07:24		17:22 (22)	07:01	07:35
	17:04	17:42	19:17	52	18:36 (22)	19:53	20:25	20:53	20:56	20:28	19:37	18:45	46	18:08 (22)	17:01	16:45
11	07:46	07:20	07:38		17:43 (22)	06:44	06:01	05:40	05:50	06:19	06:52	07:25		17:23 (22)	07:03	07:36
	17:05	17:44	19:18	52	18:35 (22)	19:54	20:26	20:53	20:56	20:27	19:36	18:43	44	18:07 (22)	17:00	16:45
12	07:46	07:19	07:36		17:43 (22)	06:43	06:00	05:40	05:51	06:21	06:53	07:26		17:24 (22)	07:04	07:37
	17:06	17:45	19:20	52	18:35 (22)	19:55	20:27	20:54	20:55	20:25	19:34	18:42	42	18:06 (22)	16:59	16:45
13	07:45	07:18	07:34		17:43 (22)	06:41	05:59	05:40	05:52	06:22	06:54	07:27		17:25 (22)	07:05	07:38
	17:07	17:46	19:21	52	18:35 (22)	19:56	20:28	20:55	20:55	20:24	19:32	18:40	39	18:04 (22)	16:58	16:45
14	07:45	07:16	07:32		17:43 (22)	06:39	05:58	05:40	05:52	06:23	06:55	07:28		17:26 (22)	07:06	07:39
	17:08	17:48	19:22	52	18:35 (22)	19:57	20:29	20:55	20:54	20:23	19:30	18:38	37	18:03 (22)	16:57	16:45
15	07:45	07:15	07:31		17:43 (22)	06:38	05:57	05:40	05:53	06:24	06:57	17:52 (22)	07:29	17:28 (22)	07:08	07:39
	17:09	17:49	19:23	51	18:34 (22)	19:58	20:31	20:56	20:54	20:21	19:28	7	17:59 (22)	18:37	16:45	
16	07:44	07:14	07:29		17:44 (22)	06:36	05:56	05:40	05:54	06:25	06:58	17:45 (22)	07:31	17:29 (22)	07:09	07:40
	17:10	17:50	19:24	50	18:34 (22)	20:00	20:32	20:56	20:53	20:20	19:27	19	18:04 (22)	18:35	16:45	
17	07:44	07:12	07:27		17:44 (22)	06:35	05:55	05:40	05:55	06:26	06:59	17:42 (22)	07:32	17:32 (22)	07:10	07:41
	17:12	17:51	19:25	49	18:33 (22)	20:00	20:33	20:56	20:52	20:18	19:25	25	18:07 (22)	18:33	16:46	
18	07:43	07:11	07:26		17:44 (22)	06:33	05:54	05:40	05:56	06:27	07:00	17:39 (22)	07:33	17:35 (22)	07:11	07:41
	17:13	17:53	19:27	48	18:32 (22)	20:01	20:34	20:57	20:52	20:17	19:23	30	18:09 (22)	18:32	16:46	
19	07:43	07:09	07:24		17:44 (22)	06:31	05:53	05:40	05:57	06:28	07:01	17:37 (22)	07:34	17:37 (22)	07:12	07:42
	17:14	17:54	19:28	47	18:31 (22)	20:02	20:35	20:57	20:51	20:15	19:21	33	18:10 (22)	18:30	16:53	16:47
20	07:42	07:08	07:22		17:46 (22)	06:30	05:52	05:40	05:57	06:29	07:02	17:34 (22)	07:35	17:34 (22)	07:14	07:43
	17:15	17:55	19:29	44	18:30 (22)	20:03	20:36	20:57	20:50	20:14	19:20	37	18:11 (22)	18:29	16:52	16:47
21	07:41	07:07	07:20		17:46 (22)	06:28	05:51	05:40	05:58	06:30	07:03	17:33 (22)	07:37	17:33 (22)	07:15	07:43
	17:17	17:57	19:30	43	18:29 (22)	20:04	20:37	20:58	20:50	20:12	19:18	39	18:12 (22)	18:27	16:51	16:47
22	07:41	07:05	07:19		17:47 (22)	06:27	05:50	05:41	05:59	06:31	07:04	17:31 (22)	07:38	17:31 (22)	07:16	07:44
	17:18	17:58	19:31	40	18:27 (22)	20:05	20:38	20:58	20:49	20:11	19:16	42	18:13 (22)	18:26	16:50	16:48
23	07:40	07:04	07:17		17:48 (22)	06:25	05:49	05:41	06:00	06:32	07:05	17:29 (22)	07:39	17:29 (22)	07:17	07:44
	17:19	17:59	9	17:16 (22)	19:32	37	18:25 (22)	20:06	20:39	20:58	20:08	19:14	44	18:13 (22)	18:24	16:50
24	07:39	07:02	06:15		17:50 (22)	06:24	05:49	05:41	06:01	06:33	07:06	17:28 (22)	07:40	17:28 (22)	07:18	07:45
	17:20	18:00	19	17:22 (22)	19:34	34	18:24 (22)	20:07	20:40	20:58	20:08	19:13	46	18:14 (22)	18:23	16:49
25	07:38	07:00	06:13		17:51 (22)	06:22	05:48	05:41	06:02	06:34	07:07	17:27 (22)	07:41	17:27 (22)	07:20	07:45
	17:22	18:02	26	17:25 (22)	19:35	31	18:22 (22)	20:09	20:40	20:58	20:06	19:11	47	18:14 (22)	18:21	16:49
26	07:38	06:59	06:12		17:53 (22)	06:21	05:47	05:42	06:03	06:35	07:08	17:26 (22)	07:43	17:26 (22)	07:21	07:45
	17:23	18:03	30	17:27 (22)	19:36	26	18:19 (22)	20:10	20:41	20:58	20:04	19:09	49	18:15 (22)	18:20	16:48
27	07:37	06:57	06:11		17:55 (22)	06:19	05:46	05:42	06:04	06:36	07:09	17:25 (22)	07:44	17:25 (22)	07:22	07:46
	17:24	18:04	35	17:29 (22)	19:37	21	18:16 (22)	20:11	20:42	20:59	20:04	19:07	50	18:15 (22)	18:18	16:48
28	07:36	06:56	06:10		18:01 (22)	06:18	05:46	05:42	06:05	06:37	07:10	17:25 (22)	07:45	17:25 (22)	07:23	07:46
	17:25	18:05	38	17:31 (22)	19:38	10	18:11 (22)	20:12	20:43	20:59	20:03	19:05	50	18:15 (22)	18:17	16:47
29	07:35		07:06		06:16	05:45	05:43	06:06	06:39	07:12	17:24 (22)	07:46		17:24 (22)	07:24	07:46
	17:27		19:39		20:13	20:44	20:59	20:42	19:58	19:04	51	18:15 (22)	18:16	18:15 (22)	16:47	16:52
30	07:34		07:05		06:15	05:44	05:43	06:07	06:40	07:13	17:23 (22)	07:48		17:23 (22)	07:25	07:47
	17:28		19:40		20:14	20:45	20:59	20:41	19:56	19:02	52	18:15 (22)	18:14	18:15 (22)	16:46	16:53
31	07:33		07:03			05:44		06:08	06:41			07:49				07:47
	17:29		19:41			20:46		20:40	19:54			18:13				16:54
Potential sun hours	294	295	370		401	452	457	463	431	375		343		294		283
Total, worst case			157		1215						621		765			
Sun reduction			0.38		0.46						0.57		0.50			
Oper. time red.			1.00		1.00						1.00		1.00			
Wind dir. red.			0.66		0.66						0.66		0.66			
Total reduction			0.25		0.30						0.37		0.33			
Total, real			39		367						232		251			

Table layout: For each day in each month the following matrix apply

Project:

2015-08-31_Arkwright Summit_SFA

Printed/Page

8/31/2015 1:05 PM / 25

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 93 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1290)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

January		February		March	April	May	June	
1	07:47	08:43 (19)	07:32	06:54	07:01	06:14	05:43	19:52 (22)
2	16:55	43 09:26 (19)	17:31	18:06	19:43	20:15	20:47	27 20:19 (22)
3	07:47	08:43 (19)	07:31	06:53	07:00	06:12	05:43	19:50 (22)
4	16:56	44 09:27 (19)	17:32	18:08	19:44	20:16	20:47	30 20:20 (22)
5	07:47	08:44 (19)	07:30	06:51	06:58	06:11	05:42	19:50 (22)
6	16:57	43 09:27 (19)	17:33	18:09	19:45	20:17	20:48	31 20:21 (22)
7	07:47	08:44 (19)	07:29	06:49	06:56	06:10	05:42	19:49 (22)
8	16:58	44 09:28 (19)	17:35	18:10	19:46	20:19	20:49	32 20:21 (22)
9	07:47	08:45 (19)	07:28	06:48	06:54	06:08	05:42	19:49 (22)
10	16:59	43 09:28 (19)	17:36	18:11	19:47	20:20	20:50	34 20:23 (22)
11	07:47	08:46 (19)	07:27	06:46	06:53	06:07	05:41	19:48 (22)
12	17:00	43 09:29 (19)	17:37	18:13	19:48	20:21	20:50	36 20:24 (22)
13	07:47	08:46 (19)	07:25	06:44	06:51	06:06	05:41	19:48 (22)
14	17:01	43 09:29 (19)	17:38	18:14	19:49	20:22	20:51	37 20:25 (22)
15	07:47	08:46 (19)	07:24	07:43	06:49	06:05	05:41	19:47 (22)
16	17:02	43 09:29 (19)	17:40	19:15	19:50	20:23	20:52	37 20:24 (22)
17	07:47	08:47 (19)	07:23	07:41	06:48	06:03	05:41	19:47 (22)
18	17:03	42 09:29 (19)	17:41	19:16	19:52	20:24	20:52	38 20:25 (22)
19	07:46	08:48 (19)	07:22	07:39	06:46	06:02	05:40	19:47 (22)
20	17:04	42 09:30 (19)	17:42	19:17	19:53	20:25	20:53	39 20:26 (22)
21	07:46	08:48 (19)	07:20	07:38	06:44	06:01	05:40	19:47 (22)
22	17:05	41 09:29 (19)	17:44	19:18	19:54	20:26	20:53	40 20:27 (22)
23	07:46	08:49 (19)	07:19	07:36	06:43	06:00	05:40	19:47 (22)
24	17:06	41 09:30 (19)	17:45	19:20	19:55	20:27	20:54	40 20:27 (22)
25	07:45	08:50 (19)	07:18	07:34	06:41	05:59	05:40	19:47 (22)
26	17:07	40 09:30 (19)	17:46	19:21	19:56	20:28	20:55	41 20:28 (22)
27	07:45	08:50 (19)	07:16	07:32	06:39	05:58	05:40	19:47 (22)
28	17:08	40 09:30 (19)	17:48	19:22	19:57	20:29	20:55	41 20:28 (22)
29	07:45	08:51 (19)	07:15	07:31	06:38	05:57	05:40	19:47 (22)
30	17:09	39 09:30 (19)	17:49	19:23	19:58	20:31	20:56	42 20:29 (22)
31	07:44	08:51 (19)	07:14	07:29	06:36	05:56	05:40	19:47 (22)
32	17:10	39 09:30 (19)	17:50	19:24	20:00	20:32	20:56	42 20:29 (22)
33	07:44	08:53 (19)	07:12	07:27	06:35	05:55	05:40	19:47 (22)
34	17:12	37 09:30 (19)	17:51	19:25	20:00	20:33	20:56	42 20:29 (22)
35	07:43	08:53 (19)	07:11	07:26	06:33	05:54	05:40	19:47 (22)
36	17:13	37 09:30 (19)	17:53	19:27	20:01	20:34	20:57	42 20:29 (22)
37	07:43	08:53 (19)	07:09	07:24	06:31	05:53	05:40	19:47 (22)
38	17:14	36 09:29 (19)	17:54	19:28	20:02	20:35	20:57	42 20:29 (22)
39	07:42	08:55 (19)	07:08	07:22	06:30	05:52	05:40	19:47 (22)
40	17:15	34 09:29 (19)	17:55	19:29	20:03	20:36	20:57	43 20:30 (22)
41	07:41	08:56 (19)	07:07	07:20	06:28	05:51	05:40	19:47 (22)
42	17:17	33 09:29 (19)	17:57	19:30	20:04	20:37	20:58	43 20:30 (22)
43	07:41	08:57 (19)	07:05	07:19	06:27	05:50	05:41	19:48 (22)
44	17:18	31 09:28 (19)	17:58	19:31	20:05	20:38	20:58	43 20:31 (22)
45	07:40	08:58 (19)	07:04	07:17	06:25	05:49	05:41	19:48 (22)
46	17:19	29 09:27 (19)	17:59	19:32	20:06	20:39	20:58	43 20:31 (22)
47	07:39	09:00 (19)	07:02	07:15	06:24	05:49	05:41	19:48 (22)
48	17:20	26 09:26 (19)	18:00	19:34	20:07	20:40	20:58	42 20:30 (22)
49	07:38	09:02 (19)	07:00	07:13	06:22	05:48	05:41	19:49 (22)
50	17:22	23 09:25 (19)	18:02	19:35	20:09	20:40	20:58	42 20:31 (22)
51	07:38	09:03 (19)	06:59	07:12	06:21	05:47	05:42	19:49 (22)
52	17:23	20 09:23 (19)	18:03	19:36	20:10	20:41	20:58	42 20:31 (22)
53	07:37	09:06 (19)	06:57	07:10	06:19	05:46	19:59 (22)	05:42
54	17:24	15 09:21 (19)	18:04	19:37	20:11	20:42	20:09 (22)	20:59
55	07:36	09:10 (19)	06:56	07:08	06:18	05:46	19:57 (22)	05:42
56	17:25	7 09:17 (19)	18:05	19:38	20:12	20:43	20:13 (22)	20:59
57	07:35			07:06	06:16	05:45	19:55 (22)	05:43
58	17:27			19:39	20:13	20:44	20:15 (22)	20:59
59	07:34			07:05	06:15	05:44	19:54 (22)	05:43
60	17:28			19:40	20:14	20:45	20:17 (22)	20:59
61	07:33			07:03		05:44	19:52 (22)	
62	17:29			19:41		20:46	20:18 (22)	
Potential sun hours	294		295	370	401	452	457	
Total, worst case	998					95	1175	
Sun reduction	0.31					0.56	0.65	
Oper. time red.	1.00					1.00	1.00	
Wind dir. red.	0.58					0.58	0.58	
Total reduction	0.18					0.32	0.38	
Total, real	180					31	443	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 26

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 93 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1290)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

July		August		September		October		November		December	
1	05:44	19:51 (22)	06:09	06:42	07:14	06:50				07:26	08:30 (19)
2	05:44	40 20:31 (22)	20:39	19:53	19:00	17:12				16:46	41 09:11 (19)
3	05:45	39 20:31 (22)	20:38	19:51	18:58	17:10				16:46	42 09:13 (19)
4	05:45	39 20:31 (22)	20:37	19:49	18:57	17:09				16:45	42 09:13 (19)
5	05:46	38 20:31 (22)	20:36	19:48	18:55	17:08				16:45	43 09:14 (19)
6	05:47	37 20:30 (22)	20:34	19:46	18:53	17:07				16:45	43 09:14 (19)
7	05:47	36 20:30 (22)	20:33	19:44	18:52	17:05				16:45	43 09:15 (19)
8	05:48	35 20:29 (22)	20:32	19:43	18:50	17:04				16:45	43 09:15 (19)
9	05:49	33 20:29 (22)	20:31	19:41	18:48	17:03				16:45	44 09:16 (19)
10	05:49	32 20:29 (22)	20:29	19:39	18:47	17:02				16:45	43 09:16 (19)
11	05:50	30 20:27 (22)	20:28	19:37	18:45	17:01				16:45	44 09:16 (19)
12	05:51	29 20:27 (22)	20:27	19:36	18:43	17:00				16:45	43 09:16 (19)
13	05:52	26 20:26 (22)	20:25	19:34	18:42	16:59				16:45	43 09:17 (19)
14	05:52	25 20:26 (22)	20:24	19:32	18:40	16:58				16:45	44 09:18 (19)
15	05:53	22 20:24 (22)	20:23	19:30	18:38	16:57	7	08:42 (19)	07:39	08:35 (19)	
16	05:54	18 20:22 (22)	20:21	19:28	18:37	16:56	15	08:49 (19)	16:45	43 09:18 (19)	
17	05:55	13 20:20 (22)	20:20	19:27	18:35	16:55	20	08:39 (19)	07:39	08:35 (19)	
18	05:56	5 20:16 (22)	20:18	19:25	18:33	16:54	23	08:54 (19)	16:45	43 09:18 (19)	
19	05:57		20:17	19:23	18:32	16:53	26	08:36 (19)	07:40	08:35 (19)	
20	05:57		20:15	19:21	18:30	16:53	29	08:56 (19)	16:46	44 09:19 (19)	
21	05:58		20:12	19:18	18:27	16:51	33	08:35 (19)	07:41	08:36 (19)	
22	05:59		20:11	19:16	18:26	16:51	34	08:58 (19)	16:46	44 09:20 (19)	
23	06:00		20:09	19:14	18:24	16:50	35	08:33 (19)	07:41	08:36 (19)	
24	06:01		20:08	19:13	18:23	16:49	37	09:02 (19)	16:47	43 09:20 (19)	
25	06:02		20:06	19:11	18:21	16:49	37	08:30 (19)	07:45	43 09:22 (19)	
26	06:03		20:04	19:09	18:20	16:48	39	09:07 (19)	16:50	43 09:23 (19)	
27	06:04		20:03	19:07	18:18	16:48	39	08:30 (19)	07:45	44 09:24 (19)	
28	06:05		20:01	19:05	18:17	16:47	40	08:30 (19)	07:46	44 09:24 (19)	
29	06:06		20:00	19:04	18:16	16:47	40	08:31 (19)	07:46	43 09:25 (19)	
30	06:07		19:58	19:02	18:14	16:46	41	09:10 (19)	16:52	43 09:25 (19)	
31	06:08		19:56	19:00	18:12	16:45		08:30 (19)	07:47	44 09:26 (19)	
Potential sun hours	463		431		375		294			283	
Total, worst case	497						526			1339	
Sun reduction	0.67						0.29			0.27	
Oper. time red.	1.00						1.00			1.00	
Wind dir. red.	0.58						0.58			0.58	
Total reduction	0.39						0.17			0.16	
Total, real	193						89			210	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

2015-08-31_Arkwright Summit_SFA

Printed/Page

8/31/2015 1:05 PM / 27

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 94 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1291)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	January		February		March		April		May		June		July		August		September		October		November		December	
1	07:47	08:49 (66)	07:32	08:16 (19)	06:54	07:01	06:14	05:43	05:44	06:09	06:42	07:14	06:50	07:43 (19)	07:26	08:43 (66)	08:54 (66)	08:43 (66)	08:43 (66)	08:43 (66)	08:43 (66)	08:43 (66)	08:43 (66)	
2	07:47	09:16 (66)	07:31	08:58 (19)	06:06	07:00	06:12	05:43	05:44	06:10	06:43	07:15	06:51	07:43 (19)	07:27	08:43 (66)	08:54 (66)	08:43 (66)	08:43 (66)	08:43 (66)	08:43 (66)	08:43 (66)	08:43 (66)	
3	07:47	09:16 (66)	07:32	08:59 (19)	06:08	07:00	06:12	05:43	05:44	06:10	06:43	07:15	06:51	07:43 (19)	07:27	08:43 (66)	08:54 (66)	08:43 (66)	08:43 (66)	08:43 (66)	08:43 (66)	08:43 (66)	08:43 (66)	
4	07:47	09:16 (66)	07:30	08:51 (66)	06:10	06:58	06:11	05:42	05:45	06:11	06:44	07:16	06:52	07:43 (19)	07:29	08:42 (66)	08:57 (66)	08:42 (66)	08:42 (66)	08:42 (66)	08:42 (66)	08:42 (66)	08:42 (66)	
5	07:47	09:16 (66)	07:33	09:00 (19)	06:09	07:00	06:13	05:43	05:44	06:11	06:44	07:16	06:52	07:43 (19)	07:29	08:42 (66)	08:57 (66)	08:42 (66)	08:42 (66)	08:42 (66)	08:42 (66)	08:42 (66)	08:42 (66)	
6	07:47	09:16 (66)	07:29	08:52 (66)	06:07	06:56	06:10	05:42	05:45	06:12	06:45	07:17	06:54	07:44 (19)	07:30	08:41 (66)	08:59 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	
7	07:47	09:16 (66)	07:35	08:59 (19)	06:11	06:58	06:11	05:42	05:45	06:11	06:44	07:16	06:52	07:43 (19)	07:29	08:42 (66)	08:57 (66)	08:42 (66)	08:42 (66)	08:42 (66)	08:42 (66)	08:42 (66)	08:42 (66)	
8	07:47	09:16 (66)	07:33	09:00 (19)	06:09	07:00	06:13	05:43	05:44	06:11	06:44	07:16	06:52	07:43 (19)	07:29	08:42 (66)	08:57 (66)	08:42 (66)	08:42 (66)	08:42 (66)	08:42 (66)	08:42 (66)	08:42 (66)	
9	07:47	09:16 (66)	07:28	08:53 (66)	06:08	06:54	06:08	05:42	05:46	06:13	06:46	07:18	06:55	07:44 (19)	07:31	08:40 (66)	08:59 (66)	08:40 (66)	08:40 (66)	08:40 (66)	08:40 (66)	08:40 (66)	08:40 (66)	
10	07:46	09:16 (66)	07:36	09:04 (19)	06:10	06:57	06:10	05:42	05:45	06:12	06:45	07:17	06:54	07:44 (19)	07:30	08:41 (66)	08:59 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	
11	07:46	09:16 (66)	07:36	09:04 (19)	06:10	06:57	06:10	05:42	05:45	06:12	06:45	07:17	06:54	07:44 (19)	07:30	08:41 (66)	08:59 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	
12	07:46	09:16 (66)	07:36	09:04 (19)	06:10	06:57	06:10	05:42	05:45	06:12	06:45	07:17	06:54	07:44 (19)	07:30	08:41 (66)	08:59 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	
13	07:45	09:16 (66)	07:36	09:04 (19)	06:10	06:57	06:10	05:42	05:45	06:12	06:45	07:17	06:54	07:44 (19)	07:30	08:41 (66)	08:59 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	
14	07:45	09:16 (66)	07:36	09:04 (19)	06:10	06:57	06:10	05:42	05:45	06:12	06:45	07:17	06:54	07:44 (19)	07:30	08:41 (66)	08:59 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	
15	07:45	09:16 (66)	07:36	09:04 (19)	06:10	06:57	06:10	05:42	05:45	06:12	06:45	07:17	06:54	07:44 (19)	07:30	08:41 (66)	08:59 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	
16	07:44	09:16 (66)	07:36	09:04 (19)	06:10	06:57	06:10	05:42	05:45	06:12	06:45	07:17	06:54	07:44 (19)	07:30	08:41 (66)	08:59 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	
17	07:44	09:16 (66)	07:36	09:04 (19)	06:10	06:57	06:10	05:42	05:45	06:12	06:45	07:17	06:54	07:44 (19)	07:30	08:41 (66)	08:59 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	
18	07:43	09:16 (66)	07:36	09:04 (19)	06:10	06:57	06:10	05:42	05:45	06:12	06:45	07:17	06:54	07:44 (19)	07:30	08:41 (66)	08:59 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	
19	07:43	09:16 (66)	07:36	09:04 (19)	06:10	06:57	06:10	05:42	05:45	06:12	06:45	07:17	06:54	07:44 (19)	07:30	08:41 (66)	08:59 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	
20	07:42	09:16 (66)	07:36	09:04 (19)	06:10	06:57	06:10	05:42	05:45	06:12	06:45	07:17	06:54	07:44 (19)	07:30	08:41 (66)	08:59 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	
21	07:41	09:16 (66)	07:36	09:04 (19)	06:10	06:57	06:10	05:42	05:45	06:12	06:45	07:17	06:54	07:44 (19)	07:30	08:41 (66)	08:59 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	
22	07:41	09:16 (66)	07:36	09:04 (19)	06:10	06:57	06:10	05:42	05:45	06:12	06:45	07:17	06:54	07:44 (19)	07:30	08:41 (66)	08:59 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	
23	07:40	09:16 (66)	07:36	09:04 (19)	06:10	06:57	06:10	05:42	05:45	06:12	06:45	07:17	06:54	07:44 (19)	07:30	08:41 (66)	08:59 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	
24	07:39	09:16 (66)	07:36	09:04 (19)	06:10	06:57	06:10	05:42	05:45	06:12	06:45	07:17	06:54	07:44 (19)	07:30	08:41 (66)	08:59 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	
25	07:38	09:16 (66)	07:36	09:04 (19)	06:10	06:57	06:10	05:42	05:45	06:12	06:45	07:17	06:54	07:44 (19)	07:30	08:41 (66)	08:59 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	
26	07:38	09:16 (66)	07:36	09:04 (19)	06:10	06:57	06:10	05:42	05:45	06:12	06:45	07:17	06:54	07:44 (19)	07:30	08:41 (66)	08:59 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	
27	07:37	09:16 (66)	07:36	09:04 (19)	06:10	06:57	06:10	05:42	05:45	06:12	06:45	07:17	06:54	07:44 (19)	07:30	08:41 (66)	08:59 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	
28	07:36	09:16 (66)	07:36	09:04 (19)	06:10	06:57	06:10	05:42	05:45	06:12	06:45	07:17	06:54	07:44 (19)	07:30	08:41 (66)	08:59 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	
29	07:35	09:16 (66)	07:36	09:04 (19)	06:10	06:57	06:10	05:42	05:45	06:12	06:45	07:17	06:54	07:44 (19)	07:30	08:41 (66)	08:59 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	
30	07:34	09:16 (66)	07:36	09:04 (19)	06:10	06:57	06:10	05:42	05:45	06:12	06:45	07:17	06:54	07:44 (19)	07:30	08:41 (66)	08:59 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	
31	07:33	09:16 (66)	07:36	09:04 (19)	06:10	06:57	06:10	05:42	05:45	06:12	06:45	07:17	06:54	07:44 (19)	07:30	08:41 (66)	08:59 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	08:41 (66)	
Potential sun hours	294	295	370	401	452	457	463	431	375	343	294	283	283	283	283	283	283	283	283	283	283	283	283	
Total, worst case	522	1129	0.38	0.31	0.57	0.58	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	
Sun reduction	0.31	0.38	0.57	0.58	0.57	0.58	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	
Oper. time red.	1.00	1.00	0.57	0.58	0.57	0.58	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	
Wind dir. red.	0.58	0.57	0.57	0.58	0.57	0.58	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	
Total reduction	0.18	0.22	0.57	0.58	0.57	0.58	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	
Total, real	93	246	197	124	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

2015-08-31_Arkwright Summit_SFA

Printed/Page

8/31/2015 1:05 PM / 28

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 95 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1292)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117		541	386	285 8,759

Cut in wind speed from power curve

	January		February		March		April		May		June		July		August		September		October		November		December						
	1	07:47		07:32		08:26 (19)	06:54	07:01	06:14	05:43	05:44	06:09	06:42	07:14							06:50	07:57 (19)	07:26	08:15 (19)					
		16:55		17:31	54	09:20 (19)	18:06	19:43	20:15	20:47	20:58	20:39	19:53	19:00							17:12	52	08:49 (19)	16:46	27	08:42 (19)			
	2	07:47		07:31		08:26 (19)	06:53	07:00	06:12	05:43	05:44	06:10	06:43	07:15							06:51	07:57 (19)	07:27		08:17 (19)				
		16:56		17:32	54	09:20 (19)	18:08	19:44	20:16	20:47	20:58	20:38	19:51	18:58							17:10	52	08:49 (19)	16:46	25	08:42 (19)			
	3	07:47		07:30		08:26 (19)	06:51	06:58	06:11	05:42	05:45	06:11	06:44	07:16							06:52	07:56 (19)	07:29		08:19 (19)				
		16:57		17:33	54	09:20 (19)	18:09	19:45	20:17	20:48	20:58	20:37	19:49	18:57							17:09	53	08:49 (19)	16:45	22	08:41 (19)			
	4	07:47		07:29		08:26 (19)	06:49	06:56	06:10	05:42	05:45	06:12	06:45	07:17							06:54	07:57 (19)	07:30		08:21 (19)				
		16:58		17:35	54	09:20 (19)	18:10	19:46	20:19	20:49	20:58	20:36	19:48	18:55							17:08	53	08:50 (19)	16:45	19	08:40 (19)			
	5	07:47		08:41 (19)	07:28	08:26 (19)	06:48	06:54	06:08	05:42	05:46	06:13	06:46	07:18							06:55	07:56 (19)	07:31		08:23 (19)				
		16:59	7	08:48 (19)	17:36	54	09:20 (19)	18:11	19:47	20:20	20:50	20:34	19:46	18:53							17:07	54	08:50 (19)	16:45	16	08:39 (19)			
	6	07:47		08:39 (19)	07:27	08:26 (19)	06:46	06:53	06:07	05:41	05:47	06:14	06:47	07:19							06:56	07:56 (19)	07:32		08:25 (19)				
		17:00	12	08:51 (19)	17:37	54	09:20 (19)	18:13	19:48	20:21	20:50	20:38	19:44	18:52							17:05	54	08:50 (19)	16:45	13	08:38 (19)			
	7	07:47		08:38 (19)	07:25	08:27 (19)	06:44	06:51	06:06	05:41	05:47	06:15	06:48	07:20							06:57	07:57 (19)	07:33		08:28 (19)				
		17:01	16	08:54 (19)	17:38	53	09:20 (19)	18:14	19:49	20:22	20:51	20:37	19:43	18:50							17:04	54	08:51 (19)	16:45	7	08:35 (19)			
	8	07:47		08:36 (19)	07:24	08:27 (19)	07:43	06:49	06:05	05:41	05:48	06:16	06:49	07:21							06:59	07:56 (19)	07:33						
		17:02	19	08:55 (19)	17:40	53	09:20 (19)	19:15	19:50	20:23	20:52	20:37	19:41	18:48							17:03	54	08:50 (19)	16:45					
	9	07:47		08:35 (19)	07:23	08:27 (19)	07:41	06:48	06:03	05:41	05:49	06:17	06:50	07:23							07:00		07:57 (19)	07:34					
		17:03	22	08:57 (19)	17:41	52	09:19 (19)	19:16	19:52	20:24	20:52	20:37	19:29	18:47							17:02	54	08:51 (19)	16:45					
	10	07:46		08:34 (19)	07:22	08:28 (19)	07:39	06:46	06:02	05:40	05:49	06:18	06:51	07:24							07:01		07:57 (19)	07:35					
		17:04	25	08:59 (19)	17:42	51	09:19 (19)	19:17	19:53	20:25	20:53	20:28	19:37	18:45							17:01	54	08:51 (19)	16:45					
	11	07:46		08:33 (19)	07:20	08:29 (19)	07:38	06:44	06:01	05:40	05:50	06:19	06:52	07:25							07:02		07:57 (19)	07:36					
		17:05	27	09:00 (19)	17:44	50	09:19 (19)	19:18	19:54	20:26	20:53	20:26	19:36	18:43							17:00	53	08:50 (19)	16:45					
	12	07:46		08:33 (19)	07:19	08:28 (19)	07:36	06:43	06:00	05:40	05:51	06:21	06:53	07:26							07:04		07:58 (19)	07:37					
		17:06	29	09:02 (19)	17:45	49	09:17 (19)	19:20	19:55	20:27	20:54	20:55	19:25	19:34							16:59	53	08:51 (19)	16:45					
	13	07:45		08:32 (19)	07:18	08:29 (19)	07:34	06:41	05:59	05:40	05:52	06:22	06:54	07:27							07:05		07:58 (19)	07:38					
		17:07	32	09:04 (19)	17:46	48	09:17 (19)	19:21	19:56	20:28	20:55	20:55	19:24	19:32							16:58	53	08:51 (19)	16:45					
	14	07:45		08:31 (19)	07:16	08:31 (19)	07:32	06:39	05:58	05:40	05:52	06:23	06:55	07:28							07:06		07:58 (19)	07:39					
		17:08	34	09:05 (19)	17:48	46	09:17 (19)	19:22	19:57	20:29	20:55	20:54	19:23	19:30							16:57	52	08:50 (19)	16:45					
	15	07:45		08:31 (19)	07:15	08:31 (19)	07:31	06:38	05:57	05:40	05:53	06:24	06:57	07:29							07:07		08:00 (19)	07:39					
		17:09	36	09:07 (19)	17:49	44	09:15 (19)	19:23	19:58	20:31	20:55	20:54	19:28	18:37							16:56	51	08:51 (19)	16:45					
	16	07:44		08:30 (19)	07:14	08:32 (19)	07:29	06:36	05:56	05:40	05:54	06:25	06:58	07:31							07:09		08:00 (19)	07:40					
		17:10	37	09:07 (19)	17:50	42	09:14 (19)	19:24	20:00	20:32	20:56	20:53	19:20	19:27							16:55	50	08:50 (19)	16:46					
	17	07:44		08:30 (19)	07:12	08:33 (19)	07:27	06:35	05:55	05:40	05:55	06:26	06:59	07:32							07:10		08:00 (19)	07:41					
		17:12	39	09:09 (19)	17:51	39	09:12 (19)	19:25	20:00	20:33	20:56	20:52	19:25	18:33							16:54	49	08:49 (19)	16:46					
	18	07:43		08:29 (19)	07:11	08:34 (19)	07:26	06:33	05:54	05:40	05:56	06:27	07:00	07:33							07:11		08:01 (19)	07:41		09:08 (66)			
		17:13	41	09:10 (19)	17:53	37	09:11 (19)	19:27	20:01	20:34	20:57	20:52	19:23	18:32							16:53	48	08:49 (19)	16:46	3	09:11 (66)			
	19	07:43		08:29 (19)	07:09	08:36 (19)	07:24	06:31	05:53	05:40	05:57	06:28	07:01	07:34							07:12		08:02 (19)	07:42		09:08 (66)			
		17:14	42	09:11 (19)	17:54	34	09:10 (19)	19:28	20:02	20:35	20:57	20:51	19:25	19:21							18:30	12	09:29 (19)	16:53	47	08:49 (19)	16:47	5	09:13 (66)
	20	07:42		08:29 (19)	07:08	08:38 (19)	07:22	06:30	05:52	05:40	05:57	06:29	07:02	07:35							09:12 (19)	07:14	08:03 (19)	07:43		09:08 (66)			
		17:15	43	09:12 (19)	17:55	29	09:07 (19)	19:29	20:03	20:36	20:57	20:50	19:24	19:20							18:29	21	09:33 (19)	16:52	46	08:49 (19)	16:47	6	09:14 (66)
	21	07:41		08:28 (19)	07:07	08:40 (19)	07:20	06:28	05:51	05:40	05:58	06:30	07:03	07:37							09:10 (19)	07:15	08:03 (19)	07:43		09:08 (66)			
		17:17	45	09:13 (19)	17:57	25	09:05 (19)	19:30	20:04	20:37	20:58	20:50	19:22	19:18							18:27	26	09:36 (19)	16:51	45	08:48 (19)	16:47	6	09:14 (66)
	22	07:41		08:28 (19)	07:05	08:43 (19)	07:19	06:27	05:50	05:41	05:59	06:31	07:04	07:38							09:08 (19)	07:16	08:05 (19)	07:44		09:09 (66)			
		17:18	46	09:14 (19)	17:58	18	09:01 (19)	19:31	20:05	20:38	20:58	20:49	19:11	19:16							18:26	30	09:38 (19)	16:51	43	08:48 (19)	16:48	6	09:15 (66)
	23	07:40		08:27 (19)	07:04	08:48 (19)	07:17	06:25	05:49	05:41	06:00	06:32	07:05	07:39							09:06 (19)	07:17	08:06 (19)	07:44		09:09 (66)			
		17:19	47	09:14 (19)	17:59	6	08:54 (19)	19:32	20:06	20:39	20:58	20:48	19:09	19:14							18:24	34	09:40 (19)	16:50	42	08:48 (19)	16:48	6	09:15 (66)
	24	07:39		08:28 (19)	07:02		07:15	06:24	05:49	05:41	06:01	06:33	07:06	07:40							09:04 (19)	07:18	08:06 (19)	07:45		09:09 (66)			
		17:20	48	09:16 (19)	18:00		09:16 (19)	19:34	20:07	20:40	20:58	20:47	19:07	19:13							18:23	37	09:41 (19)	16:49	41	08:47 (19)	16:49	6	09:15 (66)
	25	07:38		08:27 (19)	07:00		07:13	06:22	05:48	05:41	06:02	06:34	07:07	07:41							09:03 (19)	07:20	08:07 (19)	07:45		09:11 (66)			
		17:22	49	09:16 (19)	18:02		09:16 (19)	19:35	20:09	20:40	20:58	20:46	20:06	19:11							18:21	40	09:43 (19)	16:49	39	08:46 (19)	16:50	4	09:15 (66)
	26	07:38		08:27 (19)	06:59		07:12	06:21	05:47	05:42	06:03	06:35	07:08	07:43							09:02 (19)	07:21	08:09 (19)	07:45					
		17:23	50	09:17 (19)	18:03		09:16 (19)	19:36	20:10	20:41	20:58	20:45	20:04	19:09							18:20	42	09:44 (19)	16:48	37	08:46 (19)	16:50		
	27	07:37		08:27 (19)	06:57		07:10	06:19	05:46	05:42	06:04	06:36	07:09	07:44							09:00 (19)	07:22	08:10 (19)	07:46					
		17:24	51	09:18 (19)	18:04		09:17 (19)	19:37	20:11	20:42	20:59	20:44	20:03	19:07							1								

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 29

Licensed user:

EDR

217 Montgomery St.

US-SYRACUSE, NY 13202

(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 96 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1293)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

January		February		March		April		May		June	
1	07:47	08:27 (66)	07:32		06:54	07:44 (19)	07:01	06:14	05:43		
	16:55	38 09:05 (66)	17:31		18:06	52 08:36 (19)	19:43	20:15	20:47		
2	07:47	08:28 (66)	07:31		06:53	07:43 (19)	07:00	06:12	05:43		
	16:56	37 09:05 (66)	17:32		18:08	52 08:35 (19)	19:44	20:16	20:47		
3	07:47	08:28 (66)	07:30		06:51	07:44 (19)	06:58	06:11	05:43		
	16:57	38 09:06 (66)	17:33		18:09	52 08:36 (19)	19:45	20:17	20:48		
4	07:47	08:28 (66)	07:29		06:49	07:44 (19)	06:56	06:10	05:42		
	16:58	39 09:07 (66)	17:35		18:10	51 08:35 (19)	19:46	20:19	20:49		
5	07:47	08:29 (66)	07:28		06:48	07:43 (19)	06:54	06:08	05:42		
	16:59	38 09:07 (66)	17:36		18:11	51 08:34 (19)	19:47	20:20	20:50		
6	07:47	08:30 (66)	07:27		06:46	07:44 (19)	06:53	06:07	05:41		
	17:00	38 09:08 (66)	17:37		18:13	50 08:34 (19)	19:48	20:21	20:50		
7	07:47	08:30 (66)	07:25		06:44	07:44 (19)	06:51	06:06	05:41		
	17:01	38 09:08 (66)	17:39		18:14	49 08:33 (19)	19:49	20:22	20:51		
8	07:47	08:30 (66)	07:24		07:43	08:44 (19)	06:49	06:05	05:41		
	17:02	38 09:08 (66)	17:40		19:15	47 09:31 (19)	19:50	20:23	20:52		
9	07:47	08:31 (66)	07:23		07:41	08:45 (19)	06:48	06:03	05:41		
	17:03	37 09:08 (66)	17:41		19:16	46 09:31 (19)	19:52	20:24	20:52		
10	07:46	08:31 (66)	07:22		07:39	08:46 (19)	06:46	06:02	05:40		
	17:04	38 09:09 (66)	17:42		19:17	43 09:29 (19)	19:53	20:25	20:53		
11	07:46	08:31 (66)	07:20		07:38	08:46 (19)	06:44	06:01	05:40		
	17:05	38 09:09 (66)	17:44		19:18	42 09:28 (19)	19:54	20:26	20:53		
12	07:46	08:32 (66)	07:19	08:04 (19)	07:36	08:47 (19)	06:43	06:00	05:40		
	17:06	37 09:09 (66)	17:45	15 08:19 (19)	19:20	39 09:26 (19)	19:55	20:27	20:54		
13	07:45	08:33 (66)	07:18	08:00 (19)	07:34	08:49 (19)	06:41	05:59	05:40		
	17:07	37 09:10 (66)	17:46	23 08:23 (19)	19:21	35 09:24 (19)	19:56	20:28	20:55		
14	07:45	08:33 (66)	07:16	07:58 (19)	07:32	08:50 (19)	06:39	05:58	05:40		
	17:08	37 09:10 (66)	17:48	28 08:26 (19)	19:22	32 09:22 (19)	19:57	20:29	20:55		
15	07:45	08:34 (66)	07:15	07:56 (19)	07:31	08:51 (19)	06:38	05:57	05:40		
	17:09	36 09:10 (66)	17:49	31 08:27 (19)	19:23	28 09:19 (19)	19:58	20:31	20:55		
16	07:44	08:34 (66)	07:14	07:54 (19)	07:29	08:54 (19)	06:36	05:56	05:40		
	17:10	36 09:10 (66)	17:50	35 08:29 (19)	19:24	23 09:17 (19)	20:00	20:32	20:56		
17	07:44	08:36 (66)	07:12	07:52 (19)	07:27	08:58 (19)	06:35	05:55	05:40		
	17:12	34 09:10 (66)	17:51	38 08:30 (19)	19:25	15 09:13 (19)	20:00	20:33	20:56		
18	07:43	08:36 (66)	07:11	07:51 (19)	07:26		06:33	05:54	05:40		
	17:13	34 09:10 (66)	17:53	41 08:32 (19)	19:27		20:01	20:34	20:57		
19	07:43	08:36 (66)	07:09	07:51 (19)	07:24		06:31	05:53	05:40		
	17:14	33 09:09 (66)	17:54	42 08:33 (19)	19:28		20:02	20:35	20:57		
20	07:42	08:38 (66)	07:08	07:49 (19)	07:22		06:30	05:52	05:40		
	17:15	32 09:10 (66)	17:55	45 08:34 (19)	19:29		20:03	20:36	20:57		
21	07:41	08:39 (66)	07:07	07:49 (19)	07:20		06:28	05:51	05:40		
	17:17	30 09:09 (66)	17:57	46 08:35 (19)	19:30		20:04	20:37	20:58		
22	07:41	08:39 (66)	07:05	07:47 (19)	07:19		06:27	05:50	05:41		
	17:18	29 09:08 (66)	17:58	48 08:35 (19)	19:31		20:05	20:38	20:58		
23	07:40	08:40 (66)	07:04	07:46 (19)	07:17		06:25	05:49	05:41		
	17:19	27 09:07 (66)	17:59	49 08:35 (19)	19:32		20:06	20:39	20:58		
24	07:39	08:42 (66)	07:02	07:46 (19)	07:15		06:24	05:49	05:41		
	17:20	25 09:07 (66)	18:00	50 08:36 (19)	19:34		20:07	20:40	20:58		
25	07:38	08:44 (66)	07:00	07:45 (19)	07:13		06:22	05:48	05:41		
	17:22	22 09:06 (66)	18:02	51 08:36 (19)	19:35		20:09	20:40	20:58		
26	07:38	08:45 (66)	06:59	07:45 (19)	07:12		06:21	05:47	05:42		
	17:23	20 09:05 (66)	18:03	51 08:36 (19)	19:36		20:10	20:41	20:58		
27	07:37	08:48 (66)	06:57	07:44 (19)	07:10		06:19	05:46	05:42		
	17:24	15 09:03 (66)	18:04	52 08:36 (19)	19:37		20:11	20:42	20:59		
28	07:36	08:51 (66)	06:56	07:45 (19)	07:08		06:18	05:46	05:42		
	17:25	8 08:59 (66)	18:05	52 08:37 (19)	19:38		20:12	20:43	20:59		
29	07:35				07:06		06:16	05:45	05:43		
	17:27				19:39		20:13	20:44	20:59		
30	07:34				07:05		06:15	05:45	05:43		
	17:28				19:40		20:14	20:45	20:59		
31	07:33				07:03			05:44			
	17:29				19:41			20:46			
Potential sun hours	294		295		370		401	452		457	
Total, worst case		909	697		707						
Sun reduction		0.31	0.38		0.46						
Oper. time red.		1.00	1.00		1.00						
Wind dir. red.		0.58	0.59		0.59						
Total reduction		0.18	0.22		0.27						
Total, real		163	155		190						

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 30

Licensed user:

EDR

217 Montgomery St.

US-SYRACUSE, NY 13202

(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 96 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1293)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

July		August		September		October		November		December	
1	05:44	06:09	06:42			07:14		08:27 (19)	06:50		07:26
	20:58	20:39	19:53			19:00	38	09:05 (19)	17:12		16:46
2	05:44	06:10	06:43			07:15		08:25 (19)	06:51		07:27
	20:58	20:38	19:51			18:58	41	09:06 (19)	17:10		16:46
3	05:45	06:11	06:44			07:16		08:24 (19)	06:52		07:29
	20:58	20:37	19:49			18:57	42	09:06 (19)	17:09		16:45
4	05:45	06:12	06:45			07:17		08:22 (19)	06:54		07:30
	20:58	20:36	19:48			18:55	45	09:07 (19)	17:08		16:45
5	05:46	06:13	06:46			07:18		08:21 (19)	06:55		07:31
	20:58	20:34	19:46			18:53	47	09:08 (19)	17:07		16:45
6	05:47	06:14	06:47			07:19		08:21 (19)	06:56		07:32
	20:58	20:33	19:44			18:52	48	09:09 (19)	17:05		16:45
7	05:47	06:15	06:48			07:20		08:20 (19)	06:57		07:33
	20:57	20:32	19:43			18:50	49	09:09 (19)	17:04		16:45
8	05:48	06:16	06:49			07:21		08:19 (19)	06:59		07:33
	20:57	20:31	19:41			18:48	50	09:09 (19)	17:03		16:45
9	05:49	06:17	06:50			07:23		08:19 (19)	07:00		07:34
	20:57	20:29	19:39			18:47	50	09:09 (19)	17:02		16:45
10	05:49	06:18	06:51			07:24		08:18 (19)	07:01		07:35
	20:56	20:28	19:37			18:45	51	09:09 (19)	17:01		16:45
11	05:50	06:19	06:52			07:25		08:17 (19)	07:02		07:36
	20:56	20:27	19:36			18:43	52	09:09 (19)	17:00		16:45
12	05:51	06:21	06:53			07:26		08:18 (19)	07:04		07:37
	20:55	20:25	19:34			18:42	52	09:10 (19)	16:59		16:45
13	05:52	06:22	06:54			07:27		08:17 (19)	07:05		07:38
	20:55	20:24	19:32			18:40	52	09:09 (19)	16:58		16:45
14	05:52	06:23	06:55			07:28		08:17 (19)	07:06	08:23 (66)	07:39
	20:54	20:23	19:30			18:38	52	09:09 (19)	16:57	8	08:31 (66)
15	05:53	06:24	06:57			07:29		08:17 (19)	07:07	08:21 (66)	07:39
	20:54	20:21	19:28			18:37	51	09:08 (19)	16:56	15	08:36 (66)
16	05:54	06:25	06:58			07:31		08:17 (19)	07:09	08:18 (66)	07:40
	20:53	20:20	19:27			18:35	51	09:08 (19)	16:55	20	08:38 (66)
17	05:55	06:26	06:59			07:32		08:18 (19)	07:10	08:17 (66)	07:41
	20:52	20:18	19:25			18:33	50	09:08 (19)	16:54	22	08:39 (66)
18	05:56	06:27	07:00			07:33		08:18 (19)	07:11	08:15 (66)	07:41
	20:52	20:17	19:23			18:32	49	09:07 (19)	16:53	25	08:40 (66)
19	05:57	06:28	07:01			07:34		08:18 (19)	07:12	08:15 (66)	07:42
	20:51	20:15	19:21			18:30	48	09:06 (19)	16:53	27	08:42 (66)
20	05:57	06:29	07:02			07:35		08:18 (19)	07:14	08:14 (66)	07:43
	20:50	20:14	19:20			18:29	47	09:05 (19)	16:52	29	08:43 (66)
21	05:58	06:30	07:03			07:37		08:19 (19)	07:15	08:14 (66)	07:43
	20:50	20:12	19:18			18:27	46	09:05 (19)	16:51	30	08:44 (66)
22	05:59	06:31	07:04			07:38		08:20 (19)	07:16	08:14 (66)	07:44
	20:49	20:11	19:16			18:26	44	09:04 (19)	16:51	32	08:46 (66)
23	06:00	06:32	07:05			07:39		08:20 (19)	07:17	08:13 (66)	07:44
	20:48	20:09	19:14			18:24	42	09:02 (19)	16:50	33	08:46 (66)
24	06:01	06:33	07:06			07:40		08:21 (19)	07:18	08:13 (66)	07:45
	20:47	20:08	19:13			18:23	40	09:01 (19)	16:49	34	08:47 (66)
25	06:02	06:34	07:07			07:41		08:23 (19)	07:20	08:13 (66)	07:45
	20:46	20:06	19:11			18:21	37	09:00 (19)	16:49	34	08:47 (66)
26	06:03	06:35	07:08		08:42 (19)	07:43		08:24 (19)	07:21	08:13 (66)	07:45
	20:45	20:04	19:09	11	08:53 (19)	18:20	34	08:58 (19)	16:48	36	08:49 (66)
27	06:04	06:36	07:09		08:37 (19)	07:44		08:26 (19)	07:22	08:13 (66)	07:46
	20:44	20:03	19:07	20	08:57 (19)	18:18	30	08:56 (19)	16:48	36	08:49 (66)
28	06:05	06:38	07:10		08:34 (19)	07:45		08:28 (19)	07:23	08:13 (66)	07:46
	20:43	20:01	19:05	26	09:00 (19)	18:17	27	08:55 (19)	16:47	37	08:50 (66)
29	06:06	06:39	07:12		08:31 (19)	07:46		08:31 (19)	07:24	08:13 (66)	07:46
	20:42	19:58	19:04	31	09:02 (19)	18:16	21	08:52 (19)	16:47	37	08:50 (66)
30	06:07	06:40	07:13		08:29 (19)	07:48		08:34 (19)	07:25	08:13 (66)	07:47
	20:41	19:56	19:02	34	09:03 (19)	18:14	13	08:47 (19)	16:46	37	08:50 (66)
31	06:08	06:41			07:49						07:47
	20:40	19:54			18:13						16:54
Potential sun hours	463	431	375		343			294			283
Total, worst case			122		1299			492			1171
Sun reduction			0.57		0.50			0.29			0.27
Oper. time red.			1.00		1.00			1.00			1.00
Wind dir. red.			0.59		0.59			0.58			0.58
Total reduction			0.33		0.29			0.17			0.16
Total, real			41		380			82			182

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 31

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 103 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1300)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	January			February			March			April			May			June		
1	07:47		15:25 (21)	07:32		15:51 (21)	06:54		07:39 (66)	07:01		06:14		07:01 (19)	05:43		07:18 (19)	
	16:55	50	16:15 (21)	17:31	21	16:12 (21)	18:06	43	08:22 (66)	19:43		20:15	57	07:58 (19)	20:47	22	07:40 (19)	
2	07:47		15:25 (21)	07:31		15:54 (21)	06:53		07:39 (66)	07:00		06:12		07:00 (19)	05:43		07:19 (19)	
	16:56	50	16:15 (21)	17:32	15	16:09 (21)	18:08	42	08:21 (66)	19:44		20:16	58	07:58 (19)	20:47	20	07:39 (19)	
3	07:47		15:25 (21)	07:30			06:51		07:40 (66)	06:58		06:11		07:00 (19)	05:43		07:21 (19)	
	16:57	51	16:16 (21)	17:33			18:09	41	08:21 (66)	19:45		20:17	58	07:58 (19)	20:48	17	07:38 (19)	
4	07:47		15:26 (21)	07:29			06:49		07:41 (66)	06:56		06:10		07:00 (19)	05:42		07:22 (19)	
	16:58	50	16:16 (21)	17:35			18:10	38	08:19 (66)	19:46		20:19	58	07:58 (19)	20:49	13	07:35 (19)	
5	07:47		15:26 (21)	07:28			06:48		07:41 (66)	06:54		06:08		07:00 (19)	05:42		07:24 (19)	
	16:59	51	16:17 (21)	17:36			18:11	37	08:18 (66)	19:47		20:20	58	07:58 (19)	20:50	10	07:34 (19)	
6	07:47		15:27 (21)	07:27			06:46		07:42 (66)	06:53		06:07		07:00 (19)	05:41			
	17:00	51	16:18 (21)	17:37			18:13	35	08:17 (66)	19:48		20:21	57	07:57 (19)	20:50			
7	07:47		15:28 (21)	07:25			06:44		07:43 (66)	06:51		06:06		07:00 (19)	05:41			
	17:01	50	16:18 (21)	17:39			18:14	32	08:15 (66)	19:49		20:22	57	07:57 (19)	20:51			
8	07:47		15:27 (21)	07:24			07:43		08:44 (66)	06:49		06:05		07:00 (19)	05:41			
	17:02	51	16:18 (21)	17:40			19:15	29	09:13 (66)	19:50		20:23	56	07:56 (19)	20:52			
9	07:47		15:28 (21)	07:23			07:41		08:47 (66)	06:48		06:03		07:00 (19)	05:41			
	17:03	51	16:19 (21)	17:41			19:16	24	09:11 (66)	19:52		20:24	56	07:56 (19)	20:52			
10	07:46		15:29 (21)	07:22		08:00 (66)	07:39		08:49 (66)	06:46		06:02		07:01 (19)	05:40			
	17:04	50	16:19 (21)	17:42	4	08:04 (66)	19:17	19	09:08 (66)	19:53		20:25	55	07:56 (19)	20:53			
11	07:46		15:29 (21)	07:20		07:55 (66)	07:38		08:52 (66)	06:44		06:01		07:01 (19)	05:40			
	17:05	50	16:19 (21)	17:44	15	08:10 (66)	19:18	11	09:03 (66)	19:54		20:26	55	07:56 (19)	20:53			
12	07:46		15:30 (21)	07:19		07:51 (66)	07:36			06:43		07:32 (19)	06:00	07:01 (19)	05:40			
	17:06	50	16:20 (21)	17:45	21	08:12 (66)	19:20			19:55	4	07:36 (19)	20:27	54	07:55 (19)	20:54		
13	07:45		15:30 (21)	07:18		07:49 (66)	07:34			06:41		07:24 (19)	05:59		07:02 (19)	05:40		
	17:07	50	16:20 (21)	17:46	26	08:15 (66)	19:21			19:56	19	07:43 (19)	20:28	53	07:55 (19)	20:55		
14	07:45		15:30 (21)	07:16		07:48 (66)	07:32			06:39		07:21 (19)	05:58		07:02 (19)	05:40		
	17:08	50	16:20 (21)	17:48	29	08:17 (66)	19:22			19:57	25	07:46 (19)	20:29	52	07:54 (19)	20:55		
15	07:45		15:32 (21)	07:15		07:46 (66)	07:31			06:38		07:17 (19)	05:57		07:03 (19)	05:40		
	17:09	49	16:21 (21)	17:49	32	08:18 (66)	19:23			19:58	31	07:48 (19)	20:31	51	07:54 (19)	20:55		
16	07:44		15:32 (21)	07:14		07:45 (66)	07:29			06:36		07:16 (19)	05:56		07:03 (19)	05:40		
	17:11	48	16:20 (21)	17:50	35	08:20 (66)	19:24			20:00	35	07:51 (19)	20:32	50	07:53 (19)	20:56		
17	07:44		15:33 (21)	07:12		07:43 (66)	07:27			06:35		07:13 (19)	05:55		07:04 (19)	05:40		
	17:12	48	16:21 (21)	17:51	37	08:20 (66)	19:25			20:00	39	07:52 (19)	20:33	48	07:52 (19)	20:56		
18	07:43		15:33 (21)	07:11		07:43 (66)	07:26			06:33		07:11 (19)	05:54		07:04 (19)	05:40		
	17:13	48	16:21 (21)	17:53	38	08:21 (66)	19:27			20:01	42	07:53 (19)	20:34	48	07:52 (19)	20:57		
19	07:43		15:33 (21)	07:09		07:43 (66)	07:24			06:31		07:10 (19)	05:53		07:05 (19)	05:40		
	17:14	47	16:20 (21)	17:54	39	08:22 (66)	19:28			20:02	44	07:54 (19)	20:35	46	07:51 (19)	20:57		
20	07:42		15:35 (21)	07:08		07:41 (66)	07:22			06:30		07:08 (19)	05:52		07:05 (19)	05:40		
	17:15	46	16:21 (21)	17:55	42	08:23 (66)	19:29			20:03	47	07:55 (19)	20:36	45	07:50 (19)	20:57		
21	07:41		15:35 (21)	07:07		07:41 (66)	07:20			06:28		07:07 (19)	05:51		07:06 (19)	05:40		
	17:17	46	16:21 (21)	17:57	42	08:23 (66)	19:30			20:04	49	07:56 (19)	20:37	43	07:49 (19)	20:58		
22	07:41		15:36 (21)	07:05		07:40 (66)	07:19			06:27		07:06 (19)	05:50		07:07 (19)	05:41		
	17:18	44	16:20 (21)	17:58	43	08:23 (66)	19:31			20:05	50	07:56 (19)	20:38	42	07:49 (19)	20:58		
23	07:40		15:37 (21)	07:04		07:39 (66)	07:17			06:25		07:05 (19)	05:49		07:08 (19)	05:41		
	17:19	43	16:20 (21)	17:59	44	08:23 (66)	19:32			20:06	52	07:57 (19)	20:39	40	07:48 (19)	20:58		
24	07:39		15:38 (21)	07:02		07:40 (66)	07:15			06:24		07:04 (19)	05:49		07:08 (19)	05:41		
	17:20	42	16:20 (21)	18:00	44	08:24 (66)	19:34			20:07	53	07:57 (19)	20:40	39	07:47 (19)	20:58		
25	07:38		15:39 (21)	07:00		07:39 (66)	07:13			06:22		07:04 (19)	05:48		07:09 (19)	05:41		
	17:22	41	16:20 (21)	18:02	44	08:23 (66)	19:35			20:09	54	07:58 (19)	20:40	37	07:46 (19)	20:58		
26	07:38		15:40 (21)	06:59		07:39 (66)	07:12			06:21		07:03 (19)	05:47		07:11 (19)	05:42		
	17:23	39	16:19 (21)	18:03	44	08:23 (66)	19:36			20:10	55	07:58 (19)	20:41	35	07:46 (19)	20:58		
27	07:37		15:41 (21)	06:57		07:39 (66)	07:10			06:19		07:02 (19)	05:46		07:11 (19)	05:42		
	17:24	37	16:18 (21)	18:04	44	08:23 (66)	19:37			20:11	56	07:58 (19)	20:42	34	07:45 (19)	20:59		
28	07:36		15:43 (21)	06:56		07:40 (66)	07:08			06:18		07:02 (19)	05:46		07:13 (19)	05:42		
	17:25	34	16:17 (21)	18:05	43	08:23 (66)	19:38			20:12	56	07:58 (19)	20:43	31	07:44 (19)	20:59		
29	07:35		15:44 (21)				07:06			06:16		07:01 (19)	05:45		07:13 (19)	05:43		
	17:27	32	16:16 (21)				19:39			20:13	57	07:58 (19)	20:44	30	07:43 (19)	20:59		
30	07:34		15:46 (21)				07:05			06:15		07:01 (19)	05:45		07:15 (19)	05:43		
	17:28	29	16:15 (21)				19:40			20:14	57	07:58 (19)	20:45	27	07:42 (19)	20:59		
31	07:33		15:48 (21)				07:03					05:44			07:16 (19)			
	17:29	25	16:13 (21)				19:41					20:46	25	07:41 (19)				
Potential sun hours	294			295			370			401		452			457			
Total, worst case		1403			702		351			825		1455				82		
Sun reduction		0.31			0.38		0.46			0.51		0.56				0.65		
Oper. time red.		1.00			1.00		1.00			1.00		1.00				1.00		
Wind dir. red.		0.71			0.59		0.59			0.63		0.63				0.63		
Total reduction		0.22			0.23		0.27			0.33		0.36				0.42		
Total, real		313			160		96			270		523				34		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 32

Licensed user:

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Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 103 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1300)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

July		August		September		October		November		December	
1	05:44		06:09	07:12 (19)	06:42	07:14		06:50		07:26	15:11 (21)
2	05:44		06:10	07:11 (19)	06:43	07:15		06:51		07:27	15:12 (21)
3	05:45		06:11	07:10 (19)	06:44	07:16		06:52		07:29	15:12 (21)
4	05:45		06:12	07:10 (19)	06:45	07:17		06:54		07:30	15:12 (21)
5	05:46		06:13	07:10 (19)	06:46	07:18		06:55		07:31	15:13 (21)
6	05:47		06:14	07:09 (19)	06:47	07:19		06:56		07:32	15:13 (21)
7	05:47		06:15	07:09 (19)	06:48	07:20		06:57		07:33	15:14 (21)
8	05:48		06:16	07:09 (19)	06:49	07:21		06:59		07:34	15:14 (21)
9	05:49		06:17	07:09 (19)	06:50	07:22		07:00		07:35	15:14 (21)
10	05:49		06:18	07:09 (19)	06:51	07:23		07:01		07:36	15:15 (21)
11	05:50		06:19	07:09 (19)	06:52	07:24		07:02		07:37	15:15 (21)
12	05:51		06:21	07:09 (19)	06:53	07:25		07:04		07:38	15:16 (21)
13	05:52		06:22	07:10 (19)	06:54	07:26		07:05		07:39	15:16 (21)
14	05:52		06:23	07:10 (19)	06:55	07:27		07:06		07:40	15:17 (21)
15	05:53		06:24	07:10 (19)	06:56	07:28		07:07		07:41	15:17 (21)
16	05:54		06:25	07:10 (19)	06:57	07:29		07:08		07:42	15:18 (21)
17	05:55		06:26	07:10 (19)	06:58	07:30		07:09		07:43	15:18 (21)
18	05:56		06:27	07:11 (19)	06:59	07:31		07:10		07:44	15:19 (21)
19	05:57		06:28	07:11 (19)	07:00	07:32		07:11		07:45	15:20 (21)
20	05:58		06:30	07:12 (19)	07:01	07:33		07:12		07:46	15:20 (21)
21	05:59		06:31	07:12 (19)	07:02	07:34		07:13		07:47	15:21 (21)
22	06:00		06:32	07:13 (19)	07:03	07:35		07:14		07:48	15:21 (21)
23	06:01		06:33	07:13 (19)	07:04	07:36		07:15		07:49	15:22 (21)
24	06:02		06:34	07:14 (19)	07:05	07:37		07:16		07:50	15:22 (21)
25	06:03		06:35	07:14 (19)	07:06	07:38		07:17		07:51	15:23 (21)
26	06:04		06:36	07:15 (19)	07:07	07:39		07:18		07:52	15:23 (21)
27	06:05		06:37	07:15 (19)	07:08	07:40		07:19		07:53	15:24 (21)
28	06:06		06:38	07:16 (19)	07:09	07:41		07:20		07:54	15:24 (21)
29	06:07		06:39	07:16 (19)	07:10	07:42		07:21		07:55	15:25 (21)
30	06:08		06:40	07:17 (19)	07:11	07:43		07:22		07:56	15:25 (21)
31	06:09		06:41	07:17 (19)	07:12	07:44		07:23		07:57	15:26 (21)
Potential sun hours	463		431		375		343		294		283
Total, worst case	887		1497		1025		887		1558		
Sun reduction	0.67		0.64		0.50		0.29		0.27		
Oper. time red.	1.00		1.00		1.00		1.00		1.00		
Wind dir. red.	0.63		0.63		0.59		0.71		0.71		
Total reduction	0.43		0.41		0.30		0.21		0.19		
Total, real	381		615		305		185		303		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 33

Licensed user:

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Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 104 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1301)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	January			February			March			April			May			June		
1	07:47			07:32	16:28 (21)	06:54			16:45 (21)	07:01		08:12 (66)	06:14			05:43	06:26 (19)	
	16:55			17:31	38 17:06 (21)	18:06	8	16:53 (21)	19:43	28	08:40 (66)	20:15			20:47	29	06:55 (19)	
2	07:47			07:31	16:27 (21)	06:53		07:30 (66)	07:00		08:14 (66)	06:12			05:43		06:25 (19)	
	16:56			17:32	41 17:08 (21)	18:08	9	07:39 (66)	19:44	23	08:37 (66)	20:16			20:47	31	06:56 (19)	
3	07:47			07:30	16:27 (21)	06:51		07:25 (66)	06:58		08:17 (66)	06:11			05:43		06:24 (19)	
	16:57			17:33	42 17:09 (21)	18:09	20	07:45 (66)	19:45	16	08:33 (66)	20:17			20:48	33	06:57 (19)	
4	07:47			07:29	16:26 (21)	06:49		07:22 (66)	06:56			06:10			05:42		06:23 (19)	
	16:58			17:35	44 17:10 (21)	18:10	26	07:48 (66)	19:46			20:19			20:49	35	06:58 (19)	
5	07:47			07:28	16:25 (21)	06:48		07:19 (66)	06:54			06:08			05:42		06:22 (19)	
	16:59			17:36	46 17:11 (21)	18:11	30	07:49 (66)	19:47			20:20			20:50	37	06:59 (19)	
6	07:47			07:27	16:25 (21)	06:46		07:17 (66)	06:53			06:07			05:41		06:22 (19)	
	17:00			17:37	47 17:12 (21)	18:13	35	07:52 (66)	19:48			20:21			20:50	38	07:00 (19)	
7	07:47			07:25	16:25 (21)	06:44		07:15 (66)	06:51			06:06			05:41		06:22 (19)	
	17:01			17:39	48 17:13 (21)	18:14	38	07:53 (66)	19:49			20:22			20:51	39	07:01 (19)	
8	07:47			07:24	16:25 (21)	07:43		08:13 (66)	06:49			06:05			05:41		06:21 (19)	
	17:02			17:40	48 17:13 (21)	19:15	41	08:54 (66)	19:50			20:23			20:52	40	07:01 (19)	
9	07:47			07:23	16:24 (21)	07:41		08:12 (66)	06:48			06:03			05:41		06:21 (19)	
	17:03			17:41	49 17:13 (21)	19:16	43	08:55 (66)	19:52			20:24			20:52	41	07:02 (19)	
10	07:46			07:22	16:24 (21)	07:39		08:11 (66)	06:46			06:02			05:40		06:21 (19)	
	17:04			17:42	50 17:14 (21)	19:17	45	08:56 (66)	19:53			20:25			20:53	42	07:03 (19)	
11	07:46			07:20	16:25 (21)	07:38		08:09 (66)	06:44			06:01			05:40		06:21 (19)	
	17:05			17:44	49 17:14 (21)	19:18	47	08:56 (66)	19:54			20:26			20:53	43	07:04 (19)	
12	07:46			07:19	16:24 (21)	07:36		08:08 (66)	06:43			06:00			05:40		06:21 (19)	
	17:06			17:45	50 17:14 (21)	19:20	48	08:56 (66)	19:55			20:27			20:54	43	07:04 (19)	
13	07:45			07:18	16:24 (21)	07:34		08:08 (66)	06:41			05:59			05:40		06:21 (19)	
	17:07			17:46	50 17:14 (21)	19:21	49	08:57 (66)	19:56			20:28			20:55	44	07:05 (19)	
14	07:45			07:16	16:25 (21)	07:32		08:07 (66)	06:39			05:58			05:40		06:21 (19)	
	17:08			17:48	49 17:14 (21)	19:22	50	08:57 (66)	19:57			20:29			20:55	44	07:05 (19)	
15	07:45			07:15	16:24 (21)	07:31		08:06 (66)	06:38			05:57			05:40		06:21 (19)	
	17:09			17:49	49 17:13 (21)	19:23	51	08:57 (66)	19:58			20:31			20:55	45	07:06 (19)	
16	07:44			07:14	16:25 (21)	07:29		08:06 (66)	06:36			05:56			05:40		06:20 (19)	
	17:11			17:50	49 17:14 (21)	19:24	52	08:58 (66)	20:00			20:32			20:56	46	07:06 (19)	
17	07:44			07:12	16:25 (21)	07:27		08:05 (66)	06:35			05:55			05:40		06:20 (19)	
	17:12			17:51	48 17:13 (21)	19:25	52	08:57 (66)	20:00			20:33			20:56	46	07:06 (19)	
18	07:43			07:11	16:26 (21)	07:26		08:05 (66)	06:33			05:54			05:40		06:20 (19)	
	17:13			17:53	47 17:13 (21)	19:27	52	08:57 (66)	20:01			20:34			20:57	47	07:07 (19)	
19	07:43			07:09	16:27 (21)	07:24		08:04 (66)	06:31			05:53			05:40		06:20 (19)	
	17:14			17:54	46 17:13 (21)	19:28	52	08:56 (66)	20:02			20:35			20:57	47	07:07 (19)	
20	07:42			07:08	16:27 (21)	07:22		08:05 (66)	06:30			05:52			05:40		06:20 (19)	
	17:15			17:55	44 17:11 (21)	19:29	51	08:56 (66)	20:03			20:36			20:57	47	07:07 (19)	
21	07:41			07:06	16:28 (21)	07:20		08:04 (66)	06:28			05:51			05:40		06:20 (19)	
	17:17			17:57	43 17:11 (21)	19:30	51	08:55 (66)	20:04			20:37			20:58	47	07:07 (19)	
22	07:41			07:05	16:29 (21)	07:19		08:04 (66)	06:27			05:50			05:41		06:21 (19)	
	17:18			17:58	40 17:09 (21)	19:31	50	08:54 (66)	20:05			20:38			20:58	47	07:08 (19)	
23	07:40			07:03	16:29 (21)	07:17		08:04 (66)	06:25			05:49			05:41		06:21 (19)	
	17:19	10	16:41 (21)	17:59	39 17:08 (21)	19:32	49	08:53 (66)	20:06			20:39			20:58	47	07:08 (19)	
24	07:39			07:02	16:31 (21)	07:15		08:05 (66)	06:24			05:49			05:41		06:21 (19)	
	17:20	17	16:55 (21)	18:00	36 17:07 (21)	19:34	48	08:53 (66)	20:07			20:40			20:58	47	07:08 (19)	
25	07:38			07:00	16:32 (21)	07:13		08:05 (66)	06:22			05:48			05:41		06:22 (19)	
	17:22	20	16:56 (21)	18:02	33 17:05 (21)	19:35	47	08:52 (66)	20:09			20:40			20:58	47	07:09 (19)	
26	07:38			06:59	16:34 (21)	06:59		08:05 (66)	06:21			05:47			05:42		06:22 (19)	
	17:23	24	16:58 (21)	18:03	29 17:04 (21)	19:36	45	08:50 (66)	20:10			20:41			20:58	46	07:08 (19)	
27	07:37			06:57	16:33 (21)	06:57		08:06 (66)	06:19			05:46		06:38 (19)	05:42		06:23 (19)	
	17:24	26	16:59 (21)	18:04	25 17:01 (21)	19:37	43	08:49 (66)	20:11			20:42	3	06:41 (19)	20:59	45	07:08 (19)	
28	07:36			06:56	16:31 (21)	06:56		08:07 (66)	06:18			05:46			05:42		06:24 (19)	
	17:25	29	17:00 (21)	18:05	18 16:58 (21)	19:38	41	08:48 (66)	20:12			20:43	14	06:47 (19)	20:59	45	07:09 (19)	
29	07:35				16:30 (21)			08:08 (66)	06:16			05:45			06:30 (19)	05:43	06:24 (19)	
	17:27	32	17:02 (21)			19:39	38	08:46 (66)	20:13			20:44	19	06:49 (19)	20:59	44	07:08 (19)	
30	07:34				16:29 (21)			08:08 (66)	06:15			05:45			06:29 (19)	05:43	06:25 (19)	
	17:28	34	17:03 (21)			19:40	36	08:44 (66)	20:14			20:45	23	06:52 (19)	20:59	44	07:09 (19)	
31	07:33				16:29 (21)			08:10 (66)				05:44			06:27 (19)			
	17:29	36	17:05 (21)			19:41	32	08:42 (66)				20:46	26	06:53 (19)				
Potential sun hours		294		295		370			401			452			457			
Total, worst case		228		1197		1279			67			85			1276			
Sun reduction		0.31		0.38		0.46			0.51			0.56			0.65			
Oper. time red.		1.00		1.00		1.00			1.00			1.00			1.00			
Wind dir. red.		0.69		0.69		0.58			0.58			0.68			0.68			
Total reduction		0.21		0.26		0.27			0.30			0.38			0.45			
Total, real		48		312		344			20			33			568			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

2015-08-31_Arkwright Summit_SFA

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Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 104 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1301)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

July		August		September		October		November		December	
1	05:44	06:25 (19)	06:09	06:42		07:14		07:47 (66)	06:50	15:54 (21)	07:26
2	05:44	06:26 (19)	06:10	06:43		07:15		07:48 (66)	06:51	15:54 (21)	07:27
3	05:45	06:26 (19)	06:11	06:44		07:16		07:48 (66)	06:52	15:54 (21)	07:28
4	05:45	06:27 (19)	06:12	06:45		07:17		07:49 (66)	06:54	15:55 (21)	07:30
5	05:46	06:27 (19)	06:13	06:46		07:18		07:49 (66)	06:55	15:55 (21)	07:31
6	05:47	06:28 (19)	06:14	06:47		07:19		07:51 (66)	06:56	15:55 (21)	07:32
7	05:47	06:28 (19)	06:15	06:48		07:20		07:52 (66)	06:57	15:56 (21)	07:32
8	05:48	06:30 (19)	06:16	06:49		07:21		07:53 (66)	06:59	15:57 (21)	07:33
9	05:49	06:31 (19)	06:17	06:50	08:11 (66)	07:23		07:55 (66)	07:00	15:57 (21)	07:34
10	05:49	06:31 (19)	06:18	06:51	08:07 (66)	07:24		07:56 (66)	07:01	15:59 (21)	07:35
11	05:50	06:33 (19)	06:19	06:52	08:04 (66)	07:25		08:00 (66)	07:02	16:00 (21)	07:36
12	05:51	06:34 (19)	06:21	06:53	08:02 (66)	07:26		08:02 (66)	07:04	16:01 (21)	07:37
13	05:52	06:36 (19)	06:22	06:54	08:00 (66)	07:27		08:00 (66)	07:05	16:02 (21)	07:38
14	05:52	06:37 (19)	06:23	06:55	07:58 (66)	07:28		07:58 (66)	07:06	16:03 (21)	07:39
15	05:53	06:40 (19)	06:24	06:57	07:56 (66)	07:29		07:56 (66)	07:07	16:06 (21)	07:39
16	05:54	06:44 (19)	06:25	06:58	07:55 (66)	07:31		07:55 (66)	07:09	16:07 (21)	07:40
17	05:55	06:44 (19)	06:26	06:59	07:54 (66)	07:32		07:54 (66)	07:10	16:09 (21)	07:41
18	05:56	06:47 (19)	06:27	07:00	07:53 (66)	07:33		07:53 (66)	07:11	16:11 (21)	07:41
19	05:57	06:48 (19)	06:28	07:01	07:51 (66)	07:34		07:51 (66)	07:12	16:16 (21)	07:42
20	05:58	06:49 (19)	06:29	07:02	07:50 (66)	07:35		07:50 (66)	07:13	16:17 (21)	07:43
21	05:58	06:50 (19)	06:30	07:03	07:49 (66)	07:36		07:49 (66)	07:14	16:18 (21)	07:44
22	05:59	06:51 (19)	06:31	07:04	07:48 (66)	07:37		07:48 (66)	07:15	16:19 (21)	07:45
23	06:00	06:52 (19)	06:32	07:05	07:47 (66)	07:38		07:47 (66)	07:16	16:20 (21)	07:46
24	06:01	06:53 (19)	06:33	07:06	07:46 (66)	07:39		07:46 (66)	07:17	16:21 (21)	07:47
25	06:02	06:54 (19)	06:34	07:07	07:45 (66)	07:40		07:45 (66)	07:18	16:22 (21)	07:48
26	06:03	06:55 (19)	06:35	07:08	07:44 (66)	07:41		07:44 (66)	07:19	16:23 (21)	07:49
27	06:04	06:56 (19)	06:36	07:09	07:43 (66)	07:42		07:43 (66)	07:20	16:24 (21)	07:50
28	06:05	06:57 (19)	06:37	07:10	07:42 (66)	07:43		07:42 (66)	07:21	16:25 (21)	07:51
29	06:06	06:58 (19)	06:38	07:11	07:41 (66)	07:44		07:41 (66)	07:22	16:26 (21)	07:52
30	06:07	06:59 (19)	06:39	07:12	07:40 (66)	07:45		07:40 (66)	07:23	16:27 (21)	07:53
31	06:08	07:00 (19)	06:40	07:13	07:39 (66)	07:46		07:39 (66)	07:24	16:28 (21)	07:54
Potential sun hours	463		431	375		343		294		283	
Total, worst case		519		953		1172		678			
Sun reduction		0.67		0.57		0.50		0.29			
Oper. time red.		1.00		1.00		1.00		1.00			
Wind dir. red.		0.68		0.58		0.65		0.69			
Total reduction		0.46		0.33		0.33		0.20			
Total, real		238		317		381		135			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

2015-08-31_Arkwright Summit_SFA

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Licensed user:

EDR

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Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 110 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1306)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	January		February		March		April		May		June			
1	07:47	07:32			06:54		07:14 (15)	07:01	07:23 (16)	06:14		06:34 (10)	05:43	
	16:55	17:31			18:06	24	07:38 (15)	19:43	17	07:40 (16)	20:15	15	06:49 (10)	20:46
2	07:47	07:31			06:52		07:12 (15)	07:00		07:20 (16)	06:12		06:32 (10)	05:43
	16:56	17:32			18:08	26	07:38 (15)	19:44	23	07:43 (16)	20:16	15	06:47 (10)	20:47
3	07:47	07:30			06:51		07:11 (15)	06:58		07:17 (16)	06:11		06:31 (10)	05:43
	16:57	17:33			18:09	28	07:39 (15)	19:45	27	07:44 (16)	20:17	15	06:46 (10)	20:48
4	07:47	07:29			06:49		07:09 (15)	06:56		07:15 (16)	06:10		06:31 (10)	05:42
	16:58	17:35			18:10	30	07:39 (15)	19:46	30	07:45 (16)	20:19	14	06:45 (10)	20:49
5	07:47	07:28			06:48		07:08 (15)	06:54		07:14 (16)	06:08		06:33 (10)	05:42
	16:59	17:36			18:11	31	07:39 (15)	19:47	33	07:47 (16)	20:20	10	06:43 (10)	20:50
6	07:47	07:26			06:46		07:08 (15)	06:53		07:12 (16)	06:07			05:41
	17:00	17:37			18:13	31	07:39 (15)	19:48	36	07:48 (16)	20:21			20:50
7	07:47	07:25			06:44		07:08 (15)	06:51		07:11 (16)	06:06			05:41
	17:01	17:38			18:14	30	07:38 (15)	19:49	37	07:48 (16)	20:22			20:51
8	07:47	07:24			07:43		08:07 (15)	06:49		07:10 (16)	06:05			05:41
	17:02	17:40			19:15	30	08:37 (15)	19:50	39	07:49 (16)	20:23			20:52
9	07:46	07:23			07:41		08:08 (15)	06:48		07:09 (16)	06:03			05:41
	17:03	17:41			19:16	29	08:37 (15)	19:52	40	07:49 (16)	20:24			20:52
10	07:46	07:22			07:39		08:09 (15)	06:46		07:08 (16)	06:02			05:40
	17:04	17:42			19:17	27	08:36 (15)	19:53	41	07:49 (16)	20:25			20:53
11	07:46	07:20			07:38		08:09 (15)	06:44		07:08 (16)	06:01			05:40
	17:05	17:44			19:18	25	08:34 (15)	19:54	42	07:50 (16)	20:26			20:53
12	07:46	07:19			07:36		08:10 (15)	06:43		07:07 (16)	06:00			05:40
	17:06	17:45			19:20	23	08:33 (15)	19:55	42	07:49 (16)	20:27			20:54
13	07:45	07:18			07:34		08:12 (15)	06:41		07:06 (16)	05:59			05:40
	17:07	17:46			19:21	19	08:31 (15)	19:56	43	07:49 (16)	20:28			20:54
14	07:45	07:16			07:32		08:14 (15)	06:39		07:06 (16)	05:58			05:40
	17:08	17:48			19:22	14	08:28 (15)	19:57	43	07:49 (16)	20:29			20:55
15	07:45	07:15			07:31		08:17 (15)	06:38		07:06 (16)	05:57			05:40
	17:09	17:49			19:23	7	08:24 (15)	19:58	43	07:49 (16)	20:30			20:55
16	07:44	07:14			07:29			06:36		07:06 (16)	05:56			05:40
	17:10	17:50			19:24			19:59	43	07:49 (16)	20:32			20:56
17	07:44	07:12			07:27			06:35		07:05 (16)	05:55			05:40
	17:12	17:51			19:25			20:01	43	07:48 (16)	20:33			20:56
18	07:43	07:11			07:26			06:33		07:05 (16)	05:54			05:40
	17:13	17:53			19:27			20:01	42	07:47 (16)	20:34			20:57
19	07:42	07:09			07:24			06:31		07:06 (16)	05:53			05:40
	17:14	17:54			19:28			20:02	40	07:46 (16)	20:35			20:57
20	07:42	07:08			07:22			06:30		06:49 (10)	05:52			05:40
	17:15	17:55			19:29			20:03	40	07:45 (16)	20:36			20:57
21	07:41	07:06			07:20			06:28		06:48 (10)	05:51			05:40
	17:17	17:57			19:30			20:04	41	07:45 (16)	20:37			20:58
22	07:41	07:05			07:19			06:27		06:46 (10)	05:50			05:41
	17:18	17:58			19:31			20:05	41	07:43 (16)	20:38			20:58
23	07:40	07:03			07:17			06:25		06:45 (10)	05:49			05:41
	17:19	17:59			19:32			20:06	42	07:43 (16)	20:39			20:58
24	07:39	07:02			07:15			06:24		06:43 (10)	05:49			05:41
	17:20	18:00	9		07:31 (15)			20:07	42	07:41 (16)	20:39			20:58
25	07:38	07:00			07:13			06:22		06:42 (10)	05:48			05:41
	17:22	18:02	13		07:33 (15)			20:08	40	07:40 (16)	20:40			20:58
26	07:37	06:59			07:12			06:21		06:41 (10)	05:47			05:42
	17:23	18:03	17		07:36 (15)			20:10	39	07:39 (16)	20:41			20:58
27	07:37	06:57			07:10			06:19		06:39 (10)	05:46			05:42
	17:24	18:04	19		07:36 (15)			20:11	36	07:36 (16)	20:42			20:58
28	07:36	06:56			07:08			06:18		06:38 (10)	05:46			05:42
	17:25	18:05	22		07:38 (15)			20:12	33	07:34 (16)	20:43			20:58
29	07:35				07:06			06:16		06:36 (10)	05:45			05:43
	17:27				19:39			20:13	28	07:30 (16)	20:44			20:58
30	07:34				07:05			06:15		06:35 (10)	05:45			05:43
	17:28				19:40			20:14	15	06:50 (10)	20:45			20:58
31	07:33				07:03		07:29 (16)				05:44			
	17:29				19:41	5	07:34 (16)				20:46			
Potential sun hours	294	295			370			401			452			457
Total, worst case			80		379			1101			69			
Sun reduction			0.38		0.46			0.51			0.56			
Oper. time red.			1.00		1.00			1.00			1.00			
Wind dir. red.			0.58		0.58			0.63			0.66			
Total reduction			0.22		0.27			0.32			0.37			
Total, real			18		101			353			25			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

2015-08-31_Arkwright Summit_SFA

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Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdoc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 110 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1306)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

July		August		September		October		November		December	
1	05:44	06:09		06:42		07:07 (16)	07:14	07:50 (15)	06:50	07:26	
2	05:48	06:10		06:43	42	07:49 (16)	19:00	08:11 (15)	17:12	16:46	
3	05:45	06:11		06:44	41	07:48 (16)	18:58	07:48 (15)	06:51	07:27	
4	05:45	06:12		06:45	40	07:47 (16)	18:57	08:12 (15)	17:10	16:46	
5	05:46	06:13		06:46	39	07:46 (16)	18:55	07:47 (15)	06:52	07:28	
6	05:47	06:14		06:47	37	07:45 (16)	18:53	08:13 (15)	17:09	16:45	
7	05:47	06:15		06:48	36	07:44 (16)	18:52	07:45 (15)	06:54	07:29	
8	05:48	06:16	5	06:49 (10)	33	07:43 (16)	18:50	08:14 (15)	17:08	16:45	
9	05:49	06:17	11	06:50 (10)	31	07:42 (16)	18:48	07:44 (15)	06:55	07:30	
10	05:49	06:18	15	06:51 (10)	28	07:41 (16)	18:47	08:14 (15)	17:07	16:45	
11	05:50	06:19	15	06:52 (10)	23	07:40 (16)	18:45	07:43 (15)	06:56	07:31	
12	05:51	06:20	15	06:53 (10)	18	07:39 (16)	18:44	08:15 (15)	17:05	16:45	
13	05:52	06:21	22	06:54 (10)	8	07:38 (16)	18:43	07:44 (15)	06:57	07:32	
14	05:52	06:22	30	06:55 (10)		07:37 (16)	18:42	08:15 (15)	17:04	16:45	
15	05:53	06:23	33	06:56 (10)		07:36 (16)	18:41	07:43 (15)	06:59	07:33	
16	05:54	06:24	37	06:57 (10)		07:35 (16)	18:40	08:14 (15)	17:03	16:45	
17	05:55	06:25	41	06:58 (10)		07:34 (16)	18:39	07:43 (15)	07:00	07:34	
18	05:56	06:26	45	06:59 (10)		07:33 (16)	18:38	08:14 (15)	17:02	16:45	
19	05:57	06:27	49	07:00 (10)		07:32 (16)	18:37	07:44 (15)	07:01	07:35	
20	05:57	06:28	53	07:01 (10)		07:31 (16)	18:36	08:13 (15)	17:01	16:45	
21	05:58	06:29	57	07:02 (10)		07:30 (16)	18:35	07:45 (15)	07:02	07:36	
22	05:59	06:30	61	07:03 (10)		07:29 (16)	18:34	08:12 (15)	17:00	16:45	
23	06:00	06:31	65	07:04 (10)		07:28 (16)	18:33	07:46 (15)	07:04	07:37	
24	06:01	06:32	69	07:05 (10)		07:27 (16)	18:32	08:12 (15)	16:59	16:45	
25	06:02	06:33	73	07:06 (10)		07:26 (16)	18:31	07:48 (15)	07:05	07:38	
26	06:03	06:34	77	07:07 (10)		07:25 (16)	18:30	08:11 (15)	16:58	16:45	
27	06:04	06:35	81	07:08 (10)		07:24 (16)	18:29	07:49 (15)	07:06	07:38	
28	06:05	06:36	85	07:09 (10)		07:23 (16)	18:28	08:10 (15)	16:57	16:45	
29	06:06	06:37	89	07:10 (10)		07:22 (16)	18:27	07:50 (15)	07:07	07:39	
30	06:07	06:38	93	07:11 (10)		07:21 (16)	18:26	08:08 (15)	16:56	16:45	
31	06:08	06:39	97	07:12 (10)		07:20 (16)	18:25	07:51 (15)	07:09	07:40	
								08:06 (15)	16:55	16:46	
								07:53 (15)	07:10	07:41	
								08:05 (15)	16:54	16:46	
								07:54 (15)	07:11	07:41	
								08:01 (15)	16:53	16:46	
									07:12	07:42	
									16:53	16:47	
									07:14	07:43	
									16:52	16:47	
									07:15	07:43	
									16:51	16:47	
									07:16	07:44	
									16:51	16:48	
									07:17	07:44	
									16:50	16:48	
									07:18	07:45	
									16:49	16:49	
									07:20	07:45	
									16:49	16:50	
									07:21	07:45	
									16:48	16:50	
									07:22	07:46	
									16:48	16:51	
									07:23	07:46	
									16:47	16:52	
									07:24	07:46	
									16:47	16:52	
									07:25	07:46	
									16:46	16:53	
										07:47	
									18:13	16:54	
Potential sun hours	463	431		375		343		294		283	
Total, worst case			826		407		431				
Sun reduction			0.64		0.57		0.50				
Oper. time red.			1.00		1.00		1.00				
Wind dir. red.			0.63		0.63		0.58				
Total reduction			0.40		0.36		0.29				
Total, real			334		145		125				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

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Licensed user:

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(315) 471 0688

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Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 111 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1307)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

January			February			March			April			May			June		
1	07:47	07:32	06:54						07:01	07:25 (15)	06:14				05:43	06:18 (16)	
	16:55	17:31	18:06						19:43	07:56 (15)	20:15				20:46	06:58 (16)	
2	07:47	07:31	06:52						07:00	07:24 (15)	06:12				05:43	06:17 (16)	
	16:56	17:32	18:08						19:44	07:55 (15)	20:16				20:47	06:58 (16)	
3	07:47	07:30	06:51						06:58	07:24 (15)	06:11				05:43	06:18 (16)	
	16:57	17:33	18:09						19:45	07:54 (15)	20:17				20:48	06:58 (16)	
4	07:47	07:29	06:49						06:56	07:24 (15)	06:10				05:42	06:17 (16)	
	16:58	17:35	18:10						19:46	07:53 (15)	20:19				20:49	06:58 (16)	
5	07:47	07:28	06:48						06:54	07:25 (15)	06:08				05:42	06:18 (16)	
	16:59	17:36	18:11						19:47	07:53 (15)	20:20				20:50	06:58 (16)	
6	07:47	07:26	06:46						06:53	07:25 (15)	06:07				05:41	06:18 (16)	
	17:00	17:37	18:13						19:48	07:52 (15)	20:21				20:50	06:58 (16)	
7	07:47	07:25	06:44						06:51	07:25 (15)	06:06				05:41	06:19 (16)	
	17:01	17:39	18:14						19:49	07:50 (15)	20:22				20:51	06:59 (16)	
8	07:47	07:24	07:43						06:49	07:26 (15)	06:05				05:41	06:18 (16)	
	17:02	17:40	19:15						19:50	07:49 (15)	20:23				20:52	06:58 (16)	
9	07:46	07:23	07:41						06:48	07:27 (15)	06:03				05:41	06:19 (16)	
	17:03	17:41	19:16						19:52	07:47 (15)	20:24	11			06:42 (16)	20:52	39
10	07:46	07:22	07:39						06:46	07:29 (15)	06:02				06:28 (16)	05:40	39
	17:04	17:42	19:17						19:53	07:45 (15)	20:25	17			06:45 (16)	20:53	40
11	07:46	07:20	07:38						06:44	07:32 (15)	06:01				06:26 (16)	05:40	40
	17:05	17:44	19:18						19:54	07:42 (15)	20:26	21			06:47 (16)	20:53	39
12	07:46	07:19	07:36						06:43		06:00				06:24 (16)	05:40	39
	17:06	17:45	19:20						19:55		20:27	25			06:49 (16)	20:54	39
13	07:45	07:18	07:34						06:41		05:59				06:23 (16)	05:40	39
	17:07	17:46	19:21						19:56		20:28	27			06:50 (16)	20:54	39
14	07:45	07:16	07:32						06:39		05:58				06:22 (16)	05:40	39
	17:08	17:48	19:22						19:57		20:29	29			06:51 (16)	20:55	39
15	07:45	07:15	07:31						06:38		05:57				06:21 (16)	05:40	39
	17:09	17:49	19:23						19:58		20:30	31			06:52 (16)	20:55	39
16	07:44	07:14	07:29						06:36		05:56				06:20 (16)	05:40	39
	17:11	17:50	19:24						19:59		20:32	33			06:53 (16)	20:56	39
17	07:44	07:12	07:27						06:35		05:55				06:20 (16)	05:40	39
	17:12	17:51	19:25						20:01		20:33	33			06:53 (16)	20:56	39
18	07:43	07:11	07:26						06:33		05:54				06:19 (16)	05:40	39
	17:13	17:53	19:27						20:01		20:34	35			06:54 (16)	20:57	39
19	07:42	07:09	07:24						06:31		05:53				06:18 (16)	05:40	39
	17:14	17:54	19:28						20:02		20:35	36			06:54 (16)	20:57	38
20	07:42	07:08	07:22						06:30		05:52				06:18 (16)	05:40	38
	17:15	17:55	19:29						20:03		20:36	37			06:55 (16)	20:57	38
21	07:41	07:06	07:20						06:28		05:51				06:17 (16)	05:40	38
	17:17	17:57	19:30						20:04		20:37	38			06:55 (16)	20:58	38
22	07:41	07:05	07:19						06:27		05:50				06:18 (16)	05:41	38
	17:18	17:58	19:31						20:05		20:38	38			06:56 (16)	20:58	38
23	07:40	07:03	07:17						06:25		05:49				06:17 (16)	05:41	38
	17:19	17:59	19:32	9					07:47 (15)	20:06	20:39	39			06:56 (16)	20:58	38
24	07:39	07:02	07:15						07:34 (15)	20:07	05:49				06:17 (16)	05:41	38
	17:20	18:00	19:33	16					07:50 (15)	20:07	20:39	39			06:56 (16)	20:58	39
25	07:38	07:00	07:13						07:33 (15)	20:08	05:48				06:16 (16)	05:41	39
	17:22	18:02	19:35	19					07:52 (15)	20:08	20:40	40			06:56 (16)	20:58	39
26	07:37	06:59	07:12						07:31 (15)	20:09	05:47				06:17 (16)	05:42	39
	17:23	18:03	19:36	22					07:53 (15)	20:10	20:41	40			06:57 (16)	20:58	39
27	07:37	06:57	07:10						07:29 (15)	20:11	05:46				06:16 (16)	05:42	39
	17:24	18:04	19:37	25					07:54 (15)	20:11	20:42	41			06:57 (16)	20:58	39
28	07:36	06:56	07:08						07:27 (15)	20:12	05:46				06:17 (16)	05:42	39
	17:25	18:05	19:38	27					07:54 (15)	20:12	20:43	41			06:58 (16)	20:58	39
29	07:35		07:06						07:27 (15)	20:13	05:45				06:17 (16)	05:43	39
	17:27		19:39	28					07:55 (15)	20:13	20:44	40			06:57 (16)	20:58	39
30	07:34		07:05						07:26 (15)	20:14	05:45				06:17 (16)	05:43	39
	17:28		19:40	29					07:55 (15)	20:14	20:45	41			06:58 (16)	20:58	39
31	07:33		07:03						07:25 (15)		05:44				06:17 (16)		
	17:29		19:41	30					07:55 (15)		20:46	41			06:58 (16)		
Potential sun hours	294	295	370						401		452				457		
Total, worst case				205					270		773				1176		
Sun reduction				0.46					0.51		0.56				0.65		
Oper. time red.				1.00					1.00		1.00				1.00		
Wind dir. red.				0.62					0.62		0.68				0.68		
Total reduction				0.28					0.32		0.38				0.44		
Total, real				58					85		292				515		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

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Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 111 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1307)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	July		August		September		October		November	December
1	05:44		06:24 (16)	06:09	06:36 (16)	06:42	07:31 (15)	07:14	06:50	07:26
	20:58	39	07:03 (16)	20:39	06:59 (16)	19:53	10	07:41 (15)	19:00	17:12
2	05:44		06:24 (16)	06:10	06:36 (16)	06:43		07:28 (15)	07:15	06:51
	20:58	40	07:04 (16)	20:38	06:56 (16)	19:51	16	07:44 (15)	18:58	17:10
3	05:45		06:24 (16)	06:11	06:39 (16)	06:44		07:25 (15)	07:16	06:52
	20:58	40	07:04 (16)	20:37	06:54 (16)	19:49	20	07:45 (15)	18:57	17:09
4	05:45		06:25 (16)	06:12	06:42 (16)	06:45		07:23 (15)	07:17	06:54
	20:58	39	07:04 (16)	20:36	06:50 (16)	19:48	23	07:46 (15)	18:55	17:08
5	05:46		06:24 (16)	06:13		06:46		07:22 (15)	07:18	06:55
	20:58	40	07:04 (16)	20:34		19:46	25	07:47 (15)	18:53	17:07
6	05:47		06:25 (16)	06:14		06:47		07:21 (15)	07:19	06:56
	20:57	40	07:05 (16)	20:33		19:44	27	07:48 (15)	18:52	17:05
7	05:47		06:24 (16)	06:15		06:48		07:20 (15)	07:20	06:57
	20:57	40	07:04 (16)	20:32		19:42	28	07:48 (15)	18:50	17:04
8	05:48		06:25 (16)	06:16		06:49		07:19 (15)	07:21	06:59
	20:57	40	07:05 (16)	20:31		19:41	29	07:48 (15)	18:48	17:03
9	05:49		06:25 (16)	06:17		06:50		07:18 (15)	07:23	07:00
	20:57	40	07:05 (16)	20:29		19:39	30	07:48 (15)	18:47	17:02
10	05:49		06:24 (16)	06:18		06:51		07:17 (15)	07:24	07:01
	20:56	41	07:05 (16)	20:28		19:37	31	07:48 (15)	18:45	17:01
11	05:50		06:25 (16)	06:19		06:52		07:17 (15)	07:25	07:02
	20:56	40	07:05 (16)	20:27		19:35	31	07:48 (15)	18:43	17:00
12	05:51		06:25 (16)	06:21		06:53		07:17 (15)	07:26	07:04
	20:55	41	07:06 (16)	20:25		19:34	30	07:47 (15)	18:42	16:59
13	05:52		06:26 (16)	06:22		06:54		07:17 (15)	07:27	07:05
	20:55	40	07:06 (16)	20:24		19:32	30	07:47 (15)	18:40	16:58
14	05:52		06:25 (16)	06:23		06:55		07:17 (15)	07:28	07:06
	20:54	41	07:06 (16)	20:22		19:30	29	07:46 (15)	18:38	16:57
15	05:53		06:25 (16)	06:24		06:57		07:17 (15)	07:29	07:07
	20:54	41	07:06 (16)	20:21		19:28	28	07:45 (15)	18:37	16:56
16	05:54		06:26 (16)	06:25		06:58		07:18 (15)	07:31	07:09
	20:53	40	07:06 (16)	20:20		19:27	26	07:44 (15)	18:35	16:55
17	05:55		06:26 (16)	06:26		06:59		07:19 (15)	07:32	07:10
	20:52	40	07:06 (16)	20:18		19:25	23	07:42 (15)	18:33	16:54
18	05:56		06:27 (16)	06:27		07:00		07:20 (15)	07:33	07:11
	20:52	40	07:07 (16)	20:17		19:23	20	07:40 (15)	18:32	16:53
19	05:57		06:27 (16)	06:28		07:01		07:21 (15)	07:34	07:12
	20:51	40	07:07 (16)	20:15		19:21	17	07:38 (15)	18:30	16:53
20	05:58		06:26 (16)	06:29		07:02		07:23 (15)	07:35	07:14
	20:50	40	07:06 (16)	20:14		19:20	11	07:34 (15)	18:29	16:52
21	05:58		06:27 (16)	06:30		07:03		07:37		07:15
	20:49	39	07:06 (16)	20:12		19:18		18:27		16:51
22	05:59		06:27 (16)	06:31		07:04		07:38		07:16
	20:49	39	07:06 (16)	20:11		19:16		18:26		16:51
23	06:00		06:28 (16)	06:32		07:05		07:39		07:17
	20:48	37	07:05 (16)	20:09		19:14		18:24		16:50
24	06:01		06:28 (16)	06:33		07:06		07:40		07:18
	20:47	37	07:05 (16)	20:07		19:12		18:23		16:49
25	06:02		06:29 (16)	06:34		07:07		07:41		07:20
	20:46	36	07:05 (16)	20:06		19:11		18:21		16:49
26	06:03		06:30 (16)	06:35		07:08		07:43		07:21
	20:45	34	07:04 (16)	20:04		19:09		18:20		16:48
27	06:04		06:30 (16)	06:36		07:09		07:44		07:22
	20:44	34	07:04 (16)	20:03		19:07		18:18		16:48
28	06:05		06:31 (16)	06:37		07:10		07:45		07:23
	20:43	32	07:03 (16)	20:01		19:05		18:17		16:47
29	06:06		06:32 (16)	06:39		07:11		07:46		07:24
	20:42	30	07:02 (16)	19:58		19:04		18:16		16:47
30	06:07		06:33 (16)	06:40		07:13		07:47		07:25
	20:41	28	07:01 (16)	19:56		19:02		18:14		16:46
31	06:08		06:34 (16)	06:41				07:49		07:47
	20:40	26	07:00 (16)	19:54				18:13		16:54
Potential sun hours	463			431		375		343	294	283
Total, worst case	1174			66		484				
Sun reduction	0.67			0.64		0.57				
Oper. time red.	1.00			1.00		1.00				
Wind dir. red.	0.68			0.68		0.62				
Total reduction	0.45			0.43		0.35				
Total, real	530			28		171				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker
			(WTG causing flicker last time)

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 39

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 112 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1308)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December		
1	07:47 16:55 17:31	07:32 17:31 18:07	06:54 18:07 19:43	07:01 19:43 20:15	06:14 20:15 20:47	05:43 20:47 20:54	06:19 (115) 20:59 06:19 (115)	05:44 20:39 06:26 (115)	06:09 20:39 06:10	11 06:55 (115)	06:42 19:53 06:43	07:14 19:00 07:15	06:50 17:12 06:51	07:26 16:46 07:28
2	07:47 16:56 17:32	07:31 17:32 18:08	06:53 18:08 19:44	07:00 19:44 20:16	06:12 20:16 20:48	05:43 20:48 20:54	06:19 (115) 20:58 06:19 (115)	05:45 20:37 06:26 (115)	06:11 20:37 06:12		06:44 19:49 06:45	07:16 18:57 07:17	06:53 17:09 06:54	07:29 16:45 07:30
3	07:47 16:57 17:33	07:30 17:33 18:09	06:51 18:09 19:45	06:58 19:45 20:18	06:11 20:18 20:49	05:43 20:49 20:54	06:19 (115) 20:58 06:19 (115)	05:45 20:36 06:26 (115)	06:11 20:36 06:13		06:44 19:48 06:46	07:16 18:55 07:18	06:53 17:08 06:55	07:29 16:45 07:31
4	07:47 16:58 17:35	07:29 17:35 18:10	06:49 18:10 19:46	06:56 19:46 20:19	06:10 20:19 20:50	05:42 20:50 20:54	06:19 (115) 20:58 06:19 (115)	05:45 20:34 06:26 (115)	06:12 20:34 06:14		06:45 19:46 06:47	07:17 18:53 07:19	06:54 17:07 06:56	07:30 16:45 07:32
5	07:47 16:59 17:36	07:28 17:36 18:11	06:48 18:11 19:47	06:54 19:47 20:20	06:08 20:20 20:51	05:42 20:51 20:54	06:19 (115) 20:58 06:19 (115)	05:46 20:33 06:26 (115)	06:13 20:33 06:15		06:46 19:44 06:48	07:18 18:52 07:20	06:55 17:06 06:58	07:31 16:45 07:33
6	07:47 17:00 17:37	07:27 17:37 18:13	06:46 18:13 19:48	06:53 19:48 20:21	06:07 20:21 20:51	05:41 20:51 20:54	06:20 (115) 20:58 06:20 (115)	05:47 20:32 06:26 (115)	06:14 20:32 06:15		06:47 19:43 06:49	07:19 18:50 07:22	06:56 17:04 06:59	07:32 16:45 07:34
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8	07:47 17:02 17:40	07:24 17:40 18:15	06:43 18:15 19:51	06:49 19:51 20:23	06:05 20:23 20:52	05:41 20:52 20:54	06:20 (115) 20:57 06:20 (115)	05:48 20:31 06:26 (115)	06:16 20:31 06:17		06:49 19:41 06:51	07:22 18:47 07:24	06:59 17:03 07:01	07:34 16:45 07:35
9	07:47 17:03 17:41	07:23 17:41 18:16	06:41 18:16 19:52	06:48 19:52 20:24	06:03 20:24 20:52	05:41 20:52 20:54	06:20 (115) 20:57 06:20 (115)	05:49 20:31 06:26 (115)	06:17 20:29 06:18		06:50 19:39 06:51	07:23 18:47 07:24	07:00 17:02 07:01	07:34 16:45 07:35
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11	07:46 17:05 17:44	07:20 17:44 18:19	06:38 18:19 19:54	06:44 19:54 20:26	4 06:41 (115) 06:32 (115)	05:40 20:54 20:54	06:21 (115) 20:56 06:21 (115)	05:50 20:31 06:26 (115)	06:19 20:27 06:21		06:52 19:36 06:53	07:25 18:43 07:26	07:03 17:00 07:04	07:36 16:45 07:37
12	07:46 17:06 17:45	07:19 17:45 18:20	06:36 18:20 19:55	06:43 19:55 20:27	14 06:46 (115) 06:29 (115)	05:40 20:54 20:54	06:21 (115) 20:55 06:21 (115)	05:51 20:31 06:26 (115)	06:21 20:25 06:22		06:53 19:34 06:54	07:26 18:42 07:27	07:04 16:59 07:05	07:37 16:45 07:38
13	07:46 17:07 17:46	07:18 17:46 18:21	06:34 18:21 19:56	06:41 19:56 20:29	19 06:48 (115) 06:28 (115)	05:40 20:55 20:54	06:21 (115) 20:55 06:21 (115)	05:52 20:31 06:26 (115)	06:22 20:24 06:23		06:54 19:32 06:56	07:27 18:40 07:28	07:05 16:58 07:06	07:38 16:45 07:39
14	07:45 17:08 17:48	07:17 17:48 18:22	06:33 18:22 19:57	06:39 19:57 20:30	22 06:50 (115) 06:26 (115)	05:40 20:55 20:55	06:22 (115) 20:54 06:22 (115)	05:53 20:31 06:26 (115)	06:24 20:21 06:25		06:57 19:29 06:58	07:30 18:37 07:31	07:08 16:56 07:09	07:39 16:45 07:40
15	07:45 17:09 17:49	07:15 17:49 18:23	06:31 18:23 19:58	06:38 19:58 20:31	25 06:51 (115) 06:25 (115)	05:40 20:56 20:56	06:22 (115) 20:54 06:22 (115)	05:54 20:31 06:26 (115)	06:25 20:20 06:26		06:58 19:27 06:59	07:31 18:35 07:32	07:09 16:55 07:10	07:40 16:45 07:41
16	07:44 17:11 17:50	07:14 17:50 18:24	06:29 18:24 19:59	06:36 19:59 20:32	27 06:52 (115) 06:24 (115)	05:40 20:56 20:56	06:22 (115) 20:53 06:22 (115)	05:55 20:31 06:26 (115)	06:26 20:18 06:27		06:59 19:25 07:00	07:32 18:33 07:33	07:10 16:54 07:11	07:41 16:45 07:42
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18	07:43 17:13 17:53	07:11 17:53 18:27	06:26 18:27 20:01	06:33 20:01 20:34	31 06:54 (115) 06:22 (115)	05:40 20:57 20:54	06:22 (115) 20:52 06:22 (115)	05:57 20:31 06:26 (115)	06:28 20:17 06:29		07:01 19:21 07:02	07:34 18:30 07:35	07:13 16:53 07:14	07:42 16:45 07:43
19	07:43 17:14 17:54	07:10 17:54 18:28	06:24 18:28 20:02	06:31 20:02 20:35	33 06:55 (115) 06:21 (115)	05:40 20:57 20:54	06:22 (115) 20:51 06:22 (115)	05:58 20:31 06:26 (115)	06:29 20:15 06:30		07:02 19:20 07:03	07:35 18:29 07:37	07:14 16:52 07:15	07:43 16:45 07:44
20	07:42 17:15 17:55	07:08 17:55 18:29	06:22 18:29 20:03	06:30 20:03 20:36	34 06:55 (115) 06:20 (115)	05:40 20:57 20:54	06:22 (115) 20:50 06:22 (115)	05:58 20:31 06:26 (115)	06:30 20:14 06:31		07:03 19:18 07:04	07:37 18:27 07:38	07:15 16:51 07:16	07:43 16:45 07:44
21	07:41 17:17 17:57	07:07 17:57 19:30	06:20 19:30 20:04	06:28 20:04 20:37	36 06:56 (115) 06:21 (115)	05:40 20:58 20:54	06:23 (115) 20:50 06:23 (115)	05:59 20:31 06:26 (115)	06:31 20:12 06:31		07:04 19:16 07:05	07:38 18:26 07:39	07:16 16:51 07:17	07:44 16:45 07:45
22	07:41 17:18 17:58	07:05 17:58 19:31	06:19 19:31 20:05	06:27 20:05 20:38	36 06:57 (115) 06:20 (115)	05:40 20:58 20:54	06:23 (115) 20:49 06:23 (115)	06:00 20:31 06:26 (115)	06:32 20:11 06:32		07:05 19:14 07:06	07:39 18:24 07:40	07:17 16:50 07:19	07:44 16:45 07:45
23	07:40 17:19 17:59	07:04 17:59 19:32	06:17 19:32 20:06	06:25 20:06 20:39	37 06:57 (115) 06:19 (115)	05:40 20:58 20:54	06:23 (115) 20:48 06:23 (115)	06:01 20:31 06:26 (115)	06:33 20:09 06:33		07:06 19:13 07:07	07:40 18:23 07:41	07:19 16:49 07:20	07:45 16:45 07:46
24	07:39 17:20 18:00	07:02 18:00 19:34	06:15 19:34 20:07	06:24 20:07 20:40	38 06:57 (115) 06:20 (115)	05:40 20:58 20:54	06:24 (115) 20:47 06:24 (115)	06:02 20:31 06:26 (115)	06:34 20:08 06:34		07:07 19:11 07:08	07:41 18:21 07:43	07:20 16:49 07:21	07:45 16:50 07:46
25	07:38 17:22 18:02	07:01 18:02 19:35	06:13 19:35 20:09	06:22 20:09 20:41	39 06:59 (115) 06:19 (115)	05:40 20:58 20:54	06:24 (115) 20:46 06:24 (115)	06:03 20:31 06:26 (115)	06:35 20:06 06:35		07:08 19:09 07:09	07:43 18:20 07:44	07:21 16:48 07:22	07:45 16:50 07:46
26	07:38 17:23 18:03	06:59 18:03 19:36	06:12 19:36 20:10	06:21 20:10 20:41	40 06:59 (115) 06:19 (115)	05:40 20:59 20:54	06:24 (115) 20:45 06:24 (115)	06:04 20:31 06:26 (115)	06:36 20:04 06:36		07:09 19:07 07:11	07:44 18:18 07:45	07:22 16:48 07:23	07:46 16:51 07:46
27	07:37 17:24 18:04	06:57 18:04 19:37	06:10 19:37 20:11	06:18 20:11 20:42	40 06:59 (115) 06:19 (115)	05:40 20:59 20:54	06:25 (115) 20:44 06:25 (115)	06:05 20:31 06:26 (115)	06:37 20:03 06:37		07:11 19:06 07:12	07:45 18:17 07:46	07:23 16:47 07:24	07:46 16:52 07:46
28	07:36 17:25 18:05	06:56 18:05 19:38	06:08 19:38 20:12	06:16 20:12 20:43	40 06:59 (115) 06:19 (115)	05:40 20:59 20:54	06:24 (115) 20:43 06:24 (115)	06:06 20:31 06:26 (115)	06:39 20:01 06:39		07:12 19:04 07:13	07:46 18:16 07:48	07:24 16:47 07:25	07:46 16:52 07:47
29	07:35 17:27 18:07	06:55 18:07 19:40	06:06 19:40 20:13	06:15 20:13 20:44	40 06:59 (115) 06:15 (115)	05:40 20:59 20:54	06:25 (115) 20:42 06:25 (115)	06:07 20:31 06:26 (115)	06:40 19:56 06:41		07:13 19:02 19:02	07:48 18:14 07:49	07:25 16:46 07:26	07:47 16:53 07:47
30	07:34 17:28 18:08	07:05 18:08 19:41	06:15 19:41 20:14	06:15 20:14 20:45	41 07:00 (115) 06:19 (115)	05:40 20:59 20:54	06:26 (115) 20:41 06:27 (115)	06:08 20:31 06:26 (115)	06:41 19:55 06:42		18:13 19:02 19:02	07:49 18:14 07:50	07:26 16:46 07:27	07:47 16:54 07:48
31	07:33 17:29 18:09	07:03 18:09 19:42	06:14 19:42 20:15	06:14 20:15 20:46	41 07:00 (115) 06:19 (115)	05:40 20:59 20:54	06:27 (115) 20:41 06:28 (115)	06:08 20:31 06:26 (115)	06:41 19:55 06:42		18:13 19:02 19:02	07:49 18:14 07:50	07:26 16:46 07:27	07:47 16:54 07:48
Potential sun hours	294	295	370	401	452	457	463	431	375	343	294	283		
Total, worst case					666	1236	1128							
Sun reduction					0.56	0.65	0.67							
Oper. time red.					1.00	1.00	1.00							
Wind dir. red.					0.68	0.68	0.68							
Total reduction					0.38	0.44	0.45							
Total, real					252	543	511							

Project:

2015-08-31_Arkwright Summit_SFA

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Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 113 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1309)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

January		February		March		April		May		June	
1	07:47	07:32		06:54		07:27 (30)	07:01		07:21 (29)	06:14	
	16:55	17:31		18:06	50	08:17 (30)	19:43	8	07:29 (29)	20:15	35
2	07:47	07:31		06:53		07:27 (30)	07:00		07:19 (29)	06:12	
	16:56	17:32		18:08	50	08:17 (30)	19:44	10	07:29 (29)	20:16	37
3	07:47	07:30		06:51		07:27 (30)	06:58		07:17 (29)	06:11	
	16:57	17:33		18:09	51	08:18 (30)	19:45	12	07:29 (29)	20:18	38
4	07:47	07:29		06:49		07:26 (30)	06:56		07:15 (29)	06:10	
	16:58	17:35		18:10	51	08:17 (30)	19:46	13	07:28 (29)	20:19	39
5	07:47	07:28		06:48		07:25 (30)	06:54		07:14 (29)	06:08	
	16:59	17:36		18:11	52	08:17 (30)	19:47	14	07:28 (29)	20:20	39
6	07:47	07:27		06:46		07:26 (30)	06:53		07:12 (29)	06:07	
	17:00	17:37		18:13	51	08:17 (30)	19:48	15	07:27 (29)	20:21	39
7	07:47	07:25		06:44		07:25 (30)	06:51		07:10 (29)	06:06	
	17:01	17:38		18:14	52	08:17 (30)	19:49	16	07:26 (29)	20:22	39
8	07:47	07:24		07:43		08:25 (30)	06:49		07:09 (29)	06:05	
	17:02	17:40		19:15	51	09:16 (30)	19:51	16	07:25 (29)	20:23	39
9	07:47	07:23		07:41		08:25 (30)	06:48		07:07 (29)	06:03	
	17:03	17:41		19:16	51	09:16 (30)	19:52	16	07:23 (29)	20:24	38
10	07:46	07:22		07:39		08:25 (30)	06:46		07:08 (29)	06:02	
	17:04	17:42		19:17	50	09:15 (30)	19:53	13	07:21 (29)	20:25	37
11	07:46	07:20		07:38		08:25 (30)	06:44		07:11 (29)	06:01	
	17:05	17:44		19:18	49	09:14 (30)	19:54	7	07:18 (29)	20:26	36
12	07:46	07:19		07:36		08:25 (30)	06:43		06:00		
	17:06	17:45		19:20	48	09:13 (30)	19:55		06:31 (33)	05:40	38
13	07:45	07:18		07:34		08:26 (30)	06:41		07:06 (33)	05:54	38
	17:07	17:46		19:21	47	09:13 (30)	19:56		06:32 (33)	05:40	38
14	07:45	07:16		07:32		08:27 (30)	06:39		06:32 (33)	05:40	38
	17:08	17:48		19:22	44	09:11 (30)	19:57		07:05 (33)	05:55	38
15	07:45	07:15		07:31		08:27 (30)	06:38		06:33 (33)	05:40	38
	17:09	17:49		19:23	42	09:09 (30)	19:58		07:04 (33)	05:56	39
16	07:44	07:14		07:29		08:29 (30)	06:36		06:34 (33)	05:40	39
	17:10	17:50		19:24	40	09:09 (30)	20:00		07:03 (33)	05:56	39
17	07:44	07:12		07:27		08:29 (30)	06:35		06:35 (33)	05:40	39
	17:12	17:51	12	07:59 (30)	19:25	09:07 (30)	20:00		07:02 (33)	05:56	39
18	07:43	07:11		07:43 (30)	19:26	08:30 (30)	06:33		06:36 (33)	05:40	38
	17:13	17:53	21	08:04 (30)	19:27	09:04 (30)	20:01		20:04 (115)	20:57	38
19	07:43	07:09		07:41 (30)	19:24	08:32 (30)	06:31		06:37 (33)	05:40	38
	17:14	17:54	26	08:07 (30)	19:28	09:02 (30)	20:02	3	06:54 (33)	20:35	35
20	07:42	07:08		07:38 (30)	19:22	08:34 (30)	06:30		06:49 (33)	05:52	35
	17:15	17:55	31	08:09 (30)	19:29	09:00 (30)	20:03	10	06:59 (33)	20:36	36
21	07:41	07:07		07:37 (30)	19:20	08:37 (30)	06:28		06:48 (33)	05:51	36
	17:17	17:57	34	08:11 (30)	19:30	08:56 (30)	20:04	14	07:02 (33)	20:37	37
22	07:41	07:05		07:35 (30)	19:19	08:41 (30)	06:27		06:46 (33)	05:50	36
	17:18	17:58	37	08:12 (30)	19:31	08:51 (30)	20:05	17	07:03 (33)	20:38	36
23	07:40	07:04		07:33 (30)	19:17		06:25		06:45 (33)	05:49	31
	17:19	17:59	40	08:13 (30)	19:32		20:06	20	07:05 (33)	20:39	31
24	07:39	07:02		07:32 (30)	19:15		06:24		06:43 (33)	05:48	25
	17:20	18:00	42	08:14 (30)	19:34		20:07	22	07:05 (33)	20:40	25
25	07:38	07:00		07:30 (30)	19:13		06:22		06:42 (33)	05:48	27
	17:22	18:02	45	08:15 (30)	19:35		20:09	25	07:07 (33)	20:40	27
26	07:38	06:59		07:30 (30)	19:12		06:21		06:41 (33)	05:47	28
	17:23	18:03	46	08:16 (30)	19:36		20:10	27	07:08 (33)	20:41	28
27	07:37	06:57		07:29 (30)	19:10		06:19		06:39 (33)	05:46	30
	17:24	18:04	47	08:16 (30)	19:37		20:11	29	07:08 (33)	20:42	30
28	07:36	06:56		07:29 (30)	19:08		06:18		06:38 (33)	05:46	31
	17:25	18:05	48	08:17 (30)	19:38		20:12	30	07:08 (33)	20:43	31
29	07:35			07:06		07:26 (29)	06:16		06:36 (33)	05:45	31
	17:27			19:39	1	07:27 (29)	20:13	32	07:08 (33)	20:44	31
30	07:34			07:05		07:24 (29)	06:15		06:35 (33)	05:44	33
	17:28			19:40	4	07:28 (29)	20:14	34	07:09 (33)	20:45	33
31	07:33			07:03		07:22 (29)				05:44	
	17:29			19:41	6	07:28 (29)				20:46	34
Potential sun hours	294	295		370		401			452		457
Total, worst case		429		947		403		1046		1131	
Sun reduction		0.38		0.46		0.51		0.56		0.65	
Oper. time red.		1.00		1.00		1.00		1.00		1.00	
Wind dir. red.		0.59		0.59		0.65		0.63		0.58	
Total reduction		0.22		0.27		0.33		0.35		0.38	
Total, real		95		255		133		370		428	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 41

Licensed user:

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US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 113 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1309)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

July		August		September		October		November		December	
1	05:44	19:51 (115)	06:09	06:41 (33)	06:42	07:10 (29)	07:14	08:05 (30)	06:50	07:26	
2	05:48	38 20:29 (115)	20:39	07:16 (33)	19:53	7 07:17 (29)	19:00	47 08:52 (30)	17:12	16:46	
3	05:44	19:51 (115)	06:10	06:40 (33)	06:43	07:07 (29)	07:15	08:04 (30)	06:51	07:27	
4	05:48	38 20:29 (115)	20:38	07:17 (33)	19:51	13 07:20 (29)	18:58	48 08:52 (30)	17:10	16:46	
5	05:45	19:52 (115)	06:11	06:40 (33)	06:44	07:05 (29)	07:16	08:03 (30)	06:52	07:29	
6	05:48	38 20:30 (115)	20:37	07:17 (33)	19:49	16 07:21 (29)	18:57	50 08:53 (30)	17:09	16:45	
7	05:45	19:53 (115)	06:12	06:39 (33)	06:45	07:06 (29)	07:17	08:02 (30)	06:54	07:30	
8	05:48	37 20:30 (115)	20:36	07:17 (33)	19:48	16 07:22 (29)	18:55	51 08:53 (30)	17:08	16:45	
9	05:46	19:52 (115)	06:13	06:39 (33)	06:46	07:07 (29)	07:18	08:02 (30)	06:55	07:31	
10	05:48	38 20:30 (115)	20:34	07:17 (33)	19:46	16 07:23 (29)	18:53	51 08:53 (30)	17:07	16:45	
11	05:47	19:53 (115)	06:14	06:39 (33)	06:47	07:08 (29)	07:19	08:02 (30)	06:56	07:32	
12	05:47	37 20:30 (115)	20:33	07:18 (33)	19:44	15 07:23 (29)	18:52	51 08:53 (30)	17:05	16:45	
13	05:47	19:53 (115)	06:15	06:38 (33)	06:48	07:09 (29)	07:20	08:01 (30)	06:58	07:33	
14	05:48	37 20:30 (115)	20:32	07:18 (33)	19:43	14 07:23 (29)	18:50	52 08:53 (30)	17:04	16:45	
15	05:48	19:53 (115)	06:16	06:38 (33)	06:49	07:10 (29)	07:22	08:01 (30)	06:59	07:33	
16	05:47	37 20:30 (115)	20:31	07:18 (33)	19:41	13 07:23 (29)	18:48	52 08:53 (30)	17:03	16:45	
17	05:49	19:54 (115)	06:17	06:39 (33)	06:50	07:11 (29)	07:23	08:01 (30)	07:00	07:34	
18	05:47	36 20:30 (115)	20:29	07:18 (33)	19:39	12 07:23 (29)	18:47	51 08:52 (30)	17:02	16:45	
19	05:49	19:54 (115)	06:18	06:40 (33)	06:51	07:12 (29)	07:24	08:00 (30)	07:01	07:35	
20	05:50	35 20:29 (115)	20:28	07:17 (33)	19:37	10 07:22 (29)	18:45	52 08:52 (30)	17:01	16:45	
21	05:50	19:55 (115)	06:19	06:41 (33)	06:52	07:13 (29)	07:25	08:00 (30)	07:03	07:36	
22	05:56	35 20:30 (115)	20:27	07:17 (33)	19:36	9 07:22 (29)	18:43	51 08:51 (30)	17:00	16:45	
23	05:51	19:55 (115)	06:20	06:42 (33)	06:53	07:14 (29)	07:26	08:01 (30)	07:04	07:37	
24	05:55	34 20:29 (115)	20:25	07:17 (33)	19:34	7 07:21 (29)	18:42	50 08:51 (30)	16:59	16:45	
25	05:52	19:56 (115)	06:22	06:43 (33)	06:54	07:15 (29)	07:27	08:01 (30)	07:05	07:38	
26	05:52	33 20:29 (115)	20:24	07:16 (33)	19:32	4 07:19 (29)	18:40	49 08:50 (30)	16:58	16:45	
27	05:52	19:56 (115)	06:23	06:44 (33)	06:55	07:16 (29)	07:28	08:01 (30)	07:06	07:39	
28	05:54	32 20:28 (115)	20:23	07:16 (33)	19:30	2 07:18 (29)	18:38	49 08:50 (30)	16:57	16:45	
29	05:53	19:56 (115)	06:24	06:46 (33)	06:57	07:30	07:30	08:01 (30)	07:08	07:39	
30	05:54	32 20:28 (115)	20:21	07:16 (33)	19:28	18:37	47 08:48 (30)	16:56	16:45		
31	05:54	19:57 (115)	06:25	06:47 (33)	06:58	07:31	08:02 (30)	07:09	07:40		
32	05:53	30 20:27 (115)	20:20	07:15 (33)	19:27	18:35	45 08:47 (30)	16:55	16:46		
33	05:55	19:58 (115)	06:26	06:48 (33)	06:59	07:32	08:03 (30)	07:10	07:41		
34	05:52	29 20:27 (115)	20:18	07:14 (33)	19:25	18:33	44 08:47 (30)	16:54	16:46		
35	05:56	19:59 (115)	06:27	06:49 (33)	07:00	07:33	08:04 (30)	07:11	07:41		
36	05:52	27 20:26 (115)	20:17	07:13 (33)	19:23	18:32	42 08:46 (30)	16:53	16:46		
37	05:57	19:59 (115)	06:28	06:50 (33)	07:01	07:34	08:05 (30)	07:12	07:42		
38	05:51	26 20:25 (115)	20:15	07:12 (33)	19:21	18:30	39 08:44 (30)	16:53	16:47		
39	05:57	06:57 (33)	06:29	06:51 (33)	07:02	07:35	08:06 (30)	07:14	07:43		
40	05:50	26 20:24 (115)	20:14	07:10 (33)	19:20	18:29	36 08:42 (30)	16:52	16:47		
41	05:58	06:53 (33)	06:30	06:52 (33)	07:03	08:29 (30)	07:37	08:08 (30)	07:15	07:43	
42	05:50	34 20:24 (115)	20:12	07:08 (33)	19:18	4 08:33 (30)	18:27	33 08:41 (30)	16:51	16:47	
43	05:59	06:51 (33)	06:31	06:53 (33)	07:04	08:22 (30)	07:38	08:09 (30)	07:16	07:44	
44	05:49	35 20:23 (115)	20:11	07:06 (33)	19:16	18 08:40 (30)	18:26	30 08:39 (30)	16:50	16:48	
45	06:00	06:49 (33)	06:32	06:54 (33)	07:05	08:18 (30)	07:39	08:11 (30)	07:17	07:44	
46	05:48	37 20:22 (115)	20:09	07:03 (33)	19:14	25 08:43 (30)	18:24	25 08:36 (30)	16:50	16:48	
47	06:01	06:48 (33)	06:33	07:06	07:06	08:16 (30)	07:40	08:14 (30)	07:18	07:45	
48	05:47	37 20:21 (115)	20:08	19:13	29 08:45 (30)	18:23	18 08:32 (30)	16:49	16:49		
49	06:02	06:47 (33)	06:34	07:07	08:13 (30)	07:41	08:20 (30)	07:20	07:45		
50	05:46	33 20:18 (115)	20:06	19:11	33 08:46 (30)	18:21	8 08:28 (30)	16:49	16:50		
51	06:03	06:46 (33)	06:35	07:08	08:12 (30)	07:43	07:21	07:45			
52	05:45	26 07:12 (33)	20:04	19:09	37 08:49 (30)	18:20	16:48	16:50			
53	06:04	06:45 (33)	06:36	07:09	08:10 (30)	07:44	07:22	07:46			
54	05:44	28 07:13 (33)	20:03	19:07	40 08:50 (30)	18:18	16:48	16:51			
55	06:05	06:44 (33)	06:37	07:10	08:09 (30)	07:45	07:23	07:46			
56	05:43	30 07:14 (33)	20:01	19:05	42 08:51 (30)	18:17	16:47	16:52			
57	06:06	06:43 (33)	06:39	07:12	08:07 (30)	07:46	07:24	07:46			
58	05:42	32 07:15 (33)	19:58	19:04	44 08:51 (30)	18:16	16:47	16:52			
59	06:07	06:43 (33)	06:40	07:13	08:06 (30)	07:48	07:25	07:47			
60	05:41	33 07:16 (33)	19:56	19:02	46 08:52 (30)	18:14	16:46	16:53			
61	06:08	06:42 (33)	06:41	07:14	08:07 (30)	07:49	07:27	07:47			
62	05:40	34 07:16 (33)	19:54	18:13	16:54						
63	Potential sun hours	463	431	375	343	294	283				
64	Total, worst case	1034	703	472	1071						
65	Sun reduction	0.67	0.64	0.57	0.50						
66	Oper. time red.	1.00	1.00	1.00	1.00						
67	Wind dir. red.	0.60	0.66	0.60	0.59						
68	Total reduction	0.40	0.42	0.34	0.29						
69	Total, real	417	295	161	313						

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker		(WTG causing flicker first time)	
	Sun set (hh:mm)		Last time (hh:mm) with flicker		(WTG causing flicker last time)	

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 42

Licensed user:

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(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 114 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1310)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

January		February		March		April		May		June	
1	07:47		07:32	08:15 (30)	06:54	07:01		07:21 (29)	06:14	06:43 (33)	05:43
	16:55		17:31	09:17 (30)	18:06	19:43	20	07:41 (29)	20:15	19:53 (115)	20:47
2	07:47		07:31	08:15 (30)	06:53	07:00		07:20 (29)	06:12	06:43 (33)	05:43
	16:56		17:32	09:17 (30)	18:08	19:44	19	07:39 (29)	20:16	19:53 (115)	20:47
3	07:47		07:30	08:15 (30)	06:51	06:58		07:22 (29)	06:11	06:43 (33)	05:42
	16:57	5	08:39 (30)	17:33	09:18 (30)	18:09	14	07:36 (29)	20:18	19:55 (115)	20:48
4	07:47		07:29	08:15 (30)	06:49	06:56		07:25 (29)	06:10	06:30 (100)	05:42
	16:58	12	08:43 (30)	17:35	09:18 (30)	18:10	7	07:32 (29)	20:19	19:56 (115)	20:49
5	07:47		07:28	08:14 (30)	06:48	06:54			06:08	06:29 (100)	05:42
	16:59	15	08:45 (30)	17:36	09:17 (30)	18:11			20:20	19:57 (115)	20:50
6	07:47		07:27	08:15 (30)	06:46	06:53			06:07	06:27 (100)	05:41
	17:00	20	08:48 (30)	17:37	09:18 (30)	18:13			20:21	19:56 (115)	20:50
7	07:47		07:25	08:15 (30)	06:44	06:51			06:06	06:26 (100)	05:41
	17:01	23	08:50 (30)	17:38	09:18 (30)	18:14			20:22	19:56 (115)	20:51
8	07:47		07:24	08:15 (30)	07:43	06:49			06:05	06:25 (100)	05:41
	17:02	25	08:51 (30)	17:40	09:18 (30)	19:15			20:23	19:56 (115)	20:52
9	07:47		07:23	08:15 (30)	07:41	06:48		07:07 (33)	06:03	06:24 (100)	05:40
	17:03	28	08:53 (30)	17:41	09:17 (30)	19:16	12	07:19 (33)	20:24	19:56 (115)	20:52
10	07:46		07:22	08:15 (30)	07:39	06:46		07:05 (33)	06:02	06:23 (100)	05:40
	17:04	30	08:55 (30)	17:42	09:17 (30)	19:17	17	07:22 (33)	20:25	19:56 (115)	20:53
11	07:46		07:20	08:16 (30)	07:38	06:44		07:04 (33)	06:01	06:22 (100)	05:40
	17:05	33	08:56 (30)	17:44	09:17 (30)	19:18	21	07:25 (33)	20:26	19:56 (115)	20:54
12	07:46		07:19	08:15 (30)	07:36	06:43		07:02 (33)	06:00	06:21 (100)	05:40
	17:06	34	08:57 (30)	17:45	09:16 (30)	19:20	24	07:26 (33)	20:27	19:56 (115)	20:54
13	07:45		07:18	08:16 (30)	07:34	06:41		07:00 (33)	05:59	06:20 (100)	05:40
	17:07	36	08:59 (30)	17:46	09:16 (30)	19:21	27	07:27 (33)	20:28	19:55 (115)	20:55
14	07:45		07:16	08:17 (30)	07:32	06:39		06:59 (33)	05:58	06:19 (100)	05:40
	17:08	39	09:00 (30)	17:48	09:16 (30)	19:22	30	07:29 (33)	20:30	19:55 (115)	20:55
15	07:45		07:15	08:17 (30)	07:31	06:38		06:57 (33)	05:57	06:18 (100)	05:40
	17:09	41	09:02 (30)	17:49	09:15 (30)	19:23	33	07:30 (33)	20:31	19:54 (115)	20:56
16	07:44		07:14	08:18 (30)	07:29	06:36		06:56 (33)	05:56	06:17 (100)	05:40
	17:10	43	09:03 (30)	17:50	09:15 (30)	19:24	35	07:31 (33)	20:32	19:53 (115)	20:56
17	07:44		07:12	08:18 (30)	07:27	06:34		06:54 (33)	05:55	06:16 (100)	05:40
	17:12	45	09:05 (30)	17:51	09:13 (30)	19:25	37	07:31 (33)	20:33	19:53 (115)	20:56
18	07:43		07:11	08:19 (30)	07:26	06:33		06:52 (33)	05:54	06:15 (100)	05:40
	17:13	46	09:05 (30)	17:53	09:13 (30)	19:27	39	07:31 (33)	20:34	19:52 (115)	20:57
19	07:43		07:09	08:20 (30)	07:24	06:31		06:51 (33)	05:53	06:14 (100)	05:40
	17:14	47	09:06 (30)	17:54	09:12 (30)	19:28	41	07:32 (33)	20:35	19:51 (115)	20:57
20	07:42		07:08	08:21 (30)	07:22	06:30		06:49 (33)	05:52	06:13 (100)	05:40
	17:15	49	09:08 (30)	17:55	09:11 (30)	19:29	1	07:43 (29)	20:03	19:49 (115)	20:57
21	07:41		07:07	08:22 (30)	07:20	06:28		06:48 (33)	05:51	06:13 (100)	05:40
	17:17	51	09:09 (30)	17:57	09:10 (30)	19:30	4	07:44 (29)	20:04	19:48 (115)	20:58
22	07:41		07:05	08:23 (30)	07:19	06:27		06:46 (33)	05:50	06:16 (100)	05:41
	17:18	52	09:09 (30)	17:58	09:08 (30)	19:31	7	07:45 (29)	20:05	19:47 (115)	20:58
23	07:40		07:04	08:24 (30)	07:17	06:25		06:45 (33)	05:49	19:37 (115)	05:41
	17:19	53	09:10 (30)	17:59	09:05 (30)	19:32	9	07:45 (29)	20:06	19:44 (115)	20:58
24	07:39		07:02	08:26 (30)	07:15	06:24		06:43 (33)	05:48		05:41
	17:20	55	09:12 (30)	18:00	09:04 (30)	19:34	11	07:46 (29)	20:07	19:45 (115)	20:40
25	07:38		07:00	08:27 (30)	07:13	06:22		06:43 (33)	05:48		05:41
	17:22	55	09:12 (30)	18:02	09:01 (30)	19:35	13	07:46 (29)	20:09	19:46 (115)	20:40
26	07:38		06:59	08:30 (30)	07:12	06:21		06:43 (33)	05:47		05:42
	17:23	57	09:13 (30)	18:03	08:59 (30)	19:36	14	07:45 (29)	20:10	19:48 (115)	20:41
27	07:37		06:57	08:32 (30)	07:10	06:19		06:43 (33)	05:46		05:42
	17:24	58	09:14 (30)	18:04	08:55 (30)	19:37	16	07:45 (29)	20:11	19:48 (115)	20:42
28	07:36		06:56	08:37 (30)	07:08	06:18		06:43 (33)	05:46		05:42
	17:25	58	09:14 (30)	18:05	08:51 (30)	19:38	17	07:45 (29)	20:12	19:50 (115)	20:43
29	07:35		07:06			06:16		06:42 (33)	05:45		05:43
	17:27	60	09:15 (30)			19:39	18	07:44 (29)	20:13	19:50 (115)	20:44
30	07:34		07:05			06:15		06:43 (33)	05:44		05:43
	17:28	61	09:16 (30)			19:40	19	07:43 (29)	20:14	19:52 (115)	20:45
31	07:33		07:03			06:15			05:44		
	17:29	61	09:16 (30)			19:41	19	07:41 (29)	20:14		
Potential sun hours	294		295		370		401		452		457
Total, worst case		1192		1465		148		1025		1354	
Sun reduction		0.31		0.38		0.46		0.51		0.56	
Oper. time red.		1.00		1.00		1.00		1.00		1.00	
Wind dir. red.		0.57		0.57		0.62		0.63		0.62	
Total reduction		0.17		0.21		0.28		0.32		0.34	
Total, real		207		312		42		325		463	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

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Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
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Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 114 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1310)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

July	August	September	October	November	December
1 05:44	06:09	06:31 (100) 06:42	07:03 (33) 07:14	06:50	07:45 (30) 07:26
2 05:44	06:10	06:32 (100) 06:43	07:04 (33) 07:15	06:51	07:44 (30) 07:27
3 05:45	06:11	06:33 (100) 06:44	07:05 (33) 07:16	06:52	07:44 (30) 07:29
4 05:45	06:12	06:34 (100) 06:45	07:06 (33) 07:17	06:53	07:45 (30) 07:30
5 05:46	06:13	06:35 (100) 06:46	07:07 (33) 07:18	06:54	07:46 (30) 07:31
6 05:47	06:14	06:36 (100) 06:47	07:08 (33) 07:19	06:55	07:47 (30) 07:32
7 05:47	06:15	06:37 (100) 06:48	07:09 (33) 07:20	06:56	07:48 (30) 07:33
8 05:48	06:16	06:38 (100) 06:49	07:10 (33) 07:21	06:57	07:49 (30) 07:34
9 05:49	06:17	06:39 (100) 06:50	07:11 (33) 07:22	06:58	07:50 (30) 07:35
10 05:49	06:18	06:40 (100) 06:51	07:12 (33) 07:23	06:59	07:51 (30) 07:36
11 05:50	06:19	06:41 (100) 06:52	07:13 (33) 07:24	07:00	07:52 (30) 07:37
12 05:51	06:20	06:42 (100) 06:53	07:14 (33) 07:25	07:01	07:53 (30) 07:38
13 05:52	06:21	06:43 (100) 06:54	07:15 (33) 07:26	07:02	07:54 (30) 07:39
14 05:52	06:22	06:44 (100) 06:55	07:16 (33) 07:27	07:03	07:55 (30) 07:40
15 05:53	06:23	06:45 (100) 06:56	07:17 (33) 07:28	07:04	07:56 (30) 07:41
16 05:54	06:24	06:46 (100) 06:57	07:18 (33) 07:29	07:05	07:57 (30) 07:42
17 05:55	06:25	06:47 (100) 06:58	07:19 (33) 07:30	07:06	07:58 (30) 07:43
18 05:56	06:26	06:48 (100) 06:59	07:20 (33) 07:31	07:07	07:59 (30) 07:44
19 05:57	06:27	06:49 (100) 07:00	07:21 (33) 07:32	07:08	08:00 (30) 07:45
20 05:57	06:28	06:50 (100) 07:01	07:22 (33) 07:33	07:09	08:01 (30) 07:46
21 05:58	06:29	06:51 (100) 07:02	07:23 (33) 07:34	07:10	08:02 (30) 07:47
22 05:59	06:30	06:52 (100) 07:03	07:24 (33) 07:35	07:11	08:03 (30) 07:48
23 06:00	06:31	06:53 (100) 07:04	07:25 (33) 07:36	07:12	08:04 (30) 07:49
24 06:01	06:32	06:54 (100) 07:05	07:26 (33) 07:37	07:13	08:05 (30) 07:50
25 06:02	06:33	06:55 (100) 07:06	07:27 (33) 07:38	07:14	08:06 (30) 07:51
26 06:03	06:34	06:56 (100) 07:07	07:28 (33) 07:39	07:15	08:07 (30) 07:52
27 06:04	06:35	06:57 (100) 07:08	07:29 (33) 07:40	07:16	08:08 (30) 07:53
28 06:05	06:36	06:58 (100) 07:09	07:30 (33) 07:41	07:17	08:09 (30) 07:54
29 06:06	06:37	06:59 (100) 07:10	07:31 (33) 07:42	07:18	08:10 (30) 07:55
30 06:07	06:38	07:00 (100) 07:11	07:32 (33) 07:43	07:19	08:11 (30) 07:56
31 06:08	06:39	07:01 (100) 07:12	07:33 (33) 07:44	07:20	08:12 (30) 07:57
Potential sun hours	463	431	375	343	283
Total, worst case	474	1819	260	865	192
Sun reduction	0.67	0.64	0.57	0.50	0.27
Oper. time red.	1.00	1.00	1.00	1.00	1.00
Wind dir. red.	0.62	0.62	0.62	0.57	0.57
Total reduction	0.41	0.39	0.35	0.28	0.15
Total, real	195	717	91	243	29

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

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Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 115 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1311)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

January		February		March		April		May		June	
1	07:47	08:10 (33)	07:32	16:24 (115)	06:54	07:01	18:43 (112)	06:14	05:43		
	16:55	30	08:40 (33)	17:31	16:59 (115)	18:06	19:43	34	19:17 (112)	20:15	20:47
2	07:47	08:10 (33)	07:31	16:24 (115)	06:53	07:00	18:43 (112)	06:12	05:43		
	16:56	31	08:41 (33)	17:32	16:24 (115)	18:08	19:44	34	19:17 (112)	20:16	20:47
3	07:47	08:10 (33)	07:30	16:24 (115)	06:51	06:58	18:42 (112)	06:11	05:42		
	16:57	31	08:41 (33)	17:33	16:24 (115)	18:09	19:45	34	19:16 (112)	20:18	20:48
4	07:47	08:10 (33)	07:29	16:24 (115)	06:49	06:56	18:41 (112)	06:10	05:42		
	16:58	32	08:42 (33)	17:35	16:24 (115)	18:10	19:46	35	19:16 (112)	20:19	20:49
5	07:47	08:10 (33)	07:28	16:24 (115)	06:48	06:54	18:42 (112)	06:08	05:42		
	16:59	32	08:42 (33)	17:36	16:24 (115)	18:11	19:47	34	19:16 (112)	20:20	20:50
6	07:47	08:10 (33)	07:27	16:24 (115)	06:46	06:53	18:42 (112)	06:07	05:41		
	17:00	33	08:43 (33)	17:37	16:24 (115)	18:13	19:48	33	19:15 (112)	20:21	20:50
7	07:47	08:10 (33)	07:25	16:24 (115)	06:44	06:51	18:41 (112)	06:06	05:41		
	17:01	34	08:44 (33)	17:38	16:24 (115)	18:14	19:49	33	19:14 (112)	20:22	20:51
8	07:47	08:10 (33)	07:24	16:25 (115)	07:43	06:49	18:42 (112)	06:05	05:41		
	17:02	33	08:43 (33)	17:40	16:25 (115)	19:15	19:51	32	19:14 (112)	20:23	20:52
9	07:47	08:11 (33)	07:23	16:25 (115)	07:41	06:48	18:43 (112)	06:03	05:40		
	17:03	33	08:44 (33)	17:41	16:25 (115)	19:16	19:52	30	19:13 (112)	20:24	20:52
10	07:46	08:11 (33)	07:22	16:26 (115)	07:39	06:46	18:43 (112)	06:02	05:40		
	17:04	34	08:45 (33)	17:42	16:26 (115)	19:17	19:53	28	19:11 (112)	20:25	20:53
11	07:46	08:11 (33)	07:20	16:27 (115)	07:38	06:44	18:44 (112)	06:01	05:40		
	17:05	33	08:44 (33)	17:44	16:27 (115)	19:18	19:54	26	19:10 (112)	20:26	20:54
12	07:46	08:12 (33)	07:19	16:27 (115)	07:36	06:43	18:45 (112)	06:00	05:40		
	17:06	33	08:45 (33)	17:45	16:27 (115)	19:20	19:55	23	19:08 (112)	20:27	20:54
13	07:45	08:13 (33)	07:18	16:29 (115)	07:34	07:54 (32)	18:47 (112)	05:59	05:40		
	17:07	33	08:46 (33)	17:46	16:29 (115)	19:21	19:56	19	19:06 (112)	20:28	20:55
14	07:45	08:13 (33)	07:16	16:30 (115)	07:32	07:52 (32)	18:49 (112)	05:58	05:40		
	17:08	32	08:45 (33)	17:48	16:30 (115)	19:22	19:57	15	19:04 (112)	20:30	20:55
15	07:45	08:14 (33)	07:15	16:31 (115)	07:31	07:50 (32)	18:54 (112)	05:57	05:40		
	17:09	32	08:46 (33)	17:49	16:31 (115)	19:23	19:58	4	18:58 (112)	20:31	20:56
16	07:44	08:14 (33)	07:14	16:34 (115)	07:29	07:49 (32)		05:56	05:40		
	17:10	32	08:46 (33)	17:50	16:34 (115)	19:24	20:00		20:32	20:56	
17	07:44	08:15 (33)	07:12	16:36 (115)	07:27	07:47 (32)	06:34	05:55	05:40		
	17:12	31	08:46 (33)	17:51	16:36 (115)	19:25	20:00		20:33	20:56	
18	07:43	08:16 (33)	07:11		07:26	07:45 (32)	06:33	05:54	05:40		
	17:13	30	08:46 (33)	17:53	19:27	08:04 (32)	20:01		20:34	20:57	
19	07:43	08:16 (33)	07:09		07:24	07:43 (32)	06:31	05:53	05:40		
	17:14	35	16:41 (115)	17:54	19:28	08:04 (32)	20:02		20:35	20:57	
20	07:42	08:18 (33)	07:08		07:22	07:42 (32)	06:30	05:52	05:40		
	17:15	40	16:45 (115)	17:55	19:29	08:05 (32)	20:03		20:36	20:57	
21	07:41	08:18 (33)	07:07		07:20	07:40 (32)	06:28	05:51	05:40		
	17:16	44	16:47 (115)	17:57	19:30	08:05 (32)	20:04		20:37	20:58	
22	07:41	08:19 (33)	07:05		07:19	07:38 (32)	06:27	05:50	05:40		
	17:18	46	16:49 (115)	17:58	19:31	08:04 (32)	20:05		20:38	20:58	
23	07:40	08:20 (33)	07:04		07:17	07:36 (32)	06:25	05:49	05:41		
	17:19	46	16:50 (115)	17:59	19:32	08:03 (32)	20:06		20:39	20:58	
24	07:39	08:22 (33)	07:02		07:15	07:35 (32)	06:24	05:48	05:41		
	17:20	47	16:53 (115)	18:00	19:34	19:09 (112)	20:07		20:40	20:58	
25	07:38	08:23 (33)	07:00		07:13	07:33 (32)	06:22	05:48	05:41		
	17:22	47	16:54 (115)	18:02	19:35	19:11 (112)	20:09		20:41	20:58	
26	07:38	08:25 (33)	06:59		07:12	07:33 (32)	06:21	05:47	05:42		
	17:23	45	16:55 (115)	18:03	19:36	19:13 (112)	20:10		20:41	20:59	
27	07:37	08:28 (33)	06:57		07:10	07:33 (32)	06:19	05:46	05:42		
	17:24	42	16:56 (115)	18:04	19:37	19:14 (112)	20:11		20:42	20:59	
28	07:36	16:25 (115)	06:56		07:08	07:35 (32)	06:18	05:46	05:42		
	17:25	31	16:56 (115)	18:05	19:38	19:16 (112)	20:12		20:43	20:59	
29	07:35	16:24 (115)			07:06	07:36 (32)	06:16	05:45	05:43		
	17:27	33	16:57 (115)		19:39	19:16 (112)	20:13		20:44	20:59	
30	07:34	16:24 (115)			07:05	07:37 (32)	06:15	05:44	05:43		
	17:28	34	16:58 (115)		19:40	19:16 (112)	20:14		20:45	20:59	
31	07:33	16:24 (115)			07:03	07:40 (32)		05:44			
	17:29	35	16:59 (115)		19:41	19:16 (112)		20:46			
Potential sun hours	294		295		370		401		452		457
Total, worst case	1104		523		584		414				
Sun reduction	0.31		0.38		0.46		0.51				
Oper. time red.	1.00		1.00		1.00		1.00				
Wind dir. red.	0.61		0.69		0.61		0.62				
Total reduction	0.19		0.26		0.28		0.31				
Total, real	207		136		165		130				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 45

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 115 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1311)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

July		August		September		October		November		December	
1	05:44	06:09		06:42	18:43 (112)	07:14		07:34 (32)	06:50	15:55 (115)	07:26
2	05:44	06:10		06:43	18:42 (112)	07:15		07:35 (32)	06:51	15:55 (115)	07:28
3	05:45	06:11		06:44	18:41 (112)	07:16		06:53	15:55 (115)	07:29	07:55 (33)
4	05:45	06:12		06:45	18:39 (112)	07:17		06:54	15:54 (115)	07:30	07:55 (33)
5	05:46	06:13		06:46	18:38 (112)	07:18		06:55	15:54 (115)	07:31	07:55 (33)
6	05:47	06:14		06:47	18:38 (112)	07:19		06:56	15:54 (115)	07:32	07:56 (33)
7	05:47	06:15		06:48	18:37 (112)	07:20		06:58	15:54 (115)	07:33	07:57 (33)
8	05:48	06:16		06:49	18:36 (112)	07:22		06:59	15:54 (115)	07:34	07:58 (33)
9	05:49	06:17		06:50	18:36 (112)	07:23		07:00	15:55 (115)	07:34	07:59 (33)
10	05:49	06:18		06:51	18:36 (112)	07:24		07:01	15:55 (115)	07:35	08:00 (33)
11	05:50	06:19		06:52	18:35 (112)	07:25		07:03	15:55 (115)	07:36	08:00 (33)
12	05:51	06:20		06:53	18:34 (112)	07:26		07:04	15:56 (115)	07:37	08:01 (33)
13	05:52	06:22		06:54	18:32 (112)	07:27		07:05	15:56 (115)	07:38	08:02 (33)
14	05:52	06:23		06:55	18:30 (112)	07:28		07:06	15:57 (115)	07:39	08:03 (33)
15	05:53	06:24		06:57	18:28 (112)	07:30		07:08	15:58 (115)	07:40	08:04 (33)
16	05:54	06:25		06:58	18:26 (112)	07:31		07:09	15:59 (115)	07:41	08:05 (33)
17	05:55	06:26		06:59	18:24 (112)	07:32		07:10	16:00 (115)	07:42	08:06 (33)
18	05:56	06:27		07:00	18:22 (112)	07:33		07:11	16:01 (115)	07:43	08:07 (33)
19	05:57	06:28		07:01	18:20 (112)	07:34		07:12	16:02 (115)	07:44	08:08 (33)
20	05:57	06:29		07:02	18:18 (112)	07:35		07:14	16:03 (115)	07:45	08:09 (33)
21	05:58	06:30		07:03	18:16 (112)	07:36		07:15	16:04 (115)	07:46	08:10 (33)
22	05:59	06:31		07:04	18:14 (112)	07:37		07:16	16:05 (115)	07:47	08:11 (33)
23	06:00	06:32		07:05	18:12 (112)	07:38		07:17	16:06 (115)	07:48	08:12 (33)
24	06:01	06:33		07:06	18:10 (112)	07:39		07:18	16:07 (115)	07:49	08:13 (33)
25	06:02	06:34		07:07	18:08 (112)	07:40		07:19	16:08 (115)	07:50	08:14 (33)
26	06:03	06:35		07:08	18:06 (112)	07:41		07:20	16:09 (115)	07:51	08:15 (33)
27	06:04	06:36		07:09	18:04 (112)	07:42		07:21	16:10 (115)	07:52	08:16 (33)
28	06:05	06:37		07:10	18:02 (112)	07:43		07:22	16:11 (115)	07:53	08:17 (33)
29	06:06	06:38		07:11	18:00 (112)	07:44		07:23	16:12 (115)	07:54	08:18 (33)
30	06:07	06:39		07:12	17:58 (112)	07:45		07:24	16:13 (115)	07:55	08:19 (33)
31	06:08	06:40		07:13	17:56 (112)	07:46		07:25	16:14 (115)	07:56	08:20 (33)
Potential sun hours	464	431		375		343		294		283	
Total, worst case		63		952		181		1105		922	
Sun reduction		0.64		0.57		0.50		0.29		0.27	
Oper. time red.		1.00		1.00		1.00		1.00		1.00	
Wind dir. red.		0.62		0.62		0.69		0.64		0.57	
Total reduction		0.40		0.35		0.34		0.19		0.15	
Total, real		25		333		62		205		142	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

2015-08-31_Arkwright Summit_SFA

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Licensed user:

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217 Montgomery St.

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Jacob Runner / jrunner@edrdoc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 116 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1312)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

		January		February		March		April		May		June	
1	07:47		08:23 (33)	07:32		16:11 (115)	06:54		07:01		18:34 (112)	06:14	05:43
	16:55	53	16:24 (115)	17:31	23	16:34 (115)	18:06		19:43	14	18:48 (112)	20:15	20:47
2	07:47		08:24 (33)	07:31		16:13 (115)	06:53		07:12 (32)		07:00	06:12	05:43
	16:56	54	16:25 (115)	17:32	19	16:32 (115)	18:08	4	07:16 (32)		19:44	20:16	20:47
3	07:47		08:25 (33)	07:30		16:15 (115)	06:51		07:11 (32)		06:58	06:11	05:42
	16:57	54	16:26 (115)	17:33	16	16:31 (115)	18:09	8	07:19 (32)		19:45	20:18	20:48
4	07:47		08:25 (33)	07:29		16:18 (115)	06:49		07:09 (32)		06:56	06:10	05:42
	16:58	54	16:27 (115)	17:35	10	16:28 (115)	18:10	11	07:20 (32)		19:46	20:19	20:49
5	07:47		08:26 (33)	07:28			06:48		07:07 (32)		06:54	06:08	05:42
	16:59	54	16:28 (115)	17:36			18:11	14	07:21 (32)		19:47	20:20	20:50
6	07:47		08:27 (33)	07:27			06:46		07:06 (32)		06:53	06:07	05:41
	17:00	54	16:29 (115)	17:37			18:13	17	07:23 (32)		19:48	20:21	20:50
7	07:47		08:28 (33)	07:25			06:44		07:04 (32)		06:51	06:06	05:41
	17:01	54	16:30 (115)	17:38			18:14	19	07:23 (32)		19:49	20:22	20:51
8	07:47		08:29 (33)	07:24			07:43		08:02 (32)		06:49	06:05	05:41
	17:02	53	16:30 (115)	17:40			19:15	25	18:53 (41)		19:51	20:23	20:52
9	07:47		08:30 (33)	07:23			07:41		08:01 (32)		06:48	06:03	05:40
	17:03	53	16:31 (115)	17:41			19:16	31	18:55 (41)		19:52	20:24	20:52
10	07:46		08:31 (33)	07:22			07:39		07:59 (32)		06:46	06:02	05:40
	17:04	52	16:32 (115)	17:42			19:17	35	18:56 (41)		19:53	20:25	20:53
11	07:46		08:33 (33)	07:20			07:38		07:57 (32)		06:44	06:01	05:40
	17:05	50	16:33 (115)	17:44			19:18	41	18:57 (41)		19:54	20:26	20:54
12	07:46		08:34 (33)	07:19			07:36		07:55 (32)		06:43	06:00	05:40
	17:06	49	16:33 (115)	17:45			19:20	47	18:57 (41)		19:55	20:27	20:54
13	07:45		08:36 (33)	07:18			07:34		07:54 (32)		06:41	05:59	05:40
	17:07	46	16:34 (115)	17:46			19:21	52	18:59 (41)		19:56	20:28	20:55
14	07:45		08:38 (33)	07:16			07:32		07:53 (32)		06:39	05:58	05:40
	17:08	42	16:34 (115)	17:48			19:22	55	19:00 (41)		19:57	20:30	20:55
15	07:45		16:00 (115)	07:15			07:31		07:53 (32)		06:38	05:57	05:40
	17:09	35	16:35 (115)	17:49			19:23	57	19:01 (41)		19:58	20:31	20:56
16	07:44		16:00 (115)	07:14			07:29		07:54 (32)		06:36	05:56	05:40
	17:10	35	16:35 (115)	17:50			19:24	59	19:03 (41)		20:00	20:32	20:56
17	07:44		16:01 (115)	07:12			07:27		07:55 (32)		06:34	05:55	05:40
	17:12	35	16:36 (115)	17:51			19:25	57	19:03 (41)		20:00	20:33	20:56
18	07:43		16:01 (115)	07:11			07:26		07:56 (32)		06:33	05:54	05:40
	17:13	35	16:36 (115)	17:53			19:27	54	19:02 (41)		20:01	20:34	20:57
19	07:43		16:01 (115)	07:09			07:24		07:58 (32)		06:31	05:53	05:40
	17:14	35	16:36 (115)	17:54			19:28	49	19:01 (112)		20:02	20:35	20:57
20	07:42		16:02 (115)	07:08			07:22		08:01 (32)		06:30	05:52	05:40
	17:15	35	16:37 (115)	17:55			19:29	44	19:02 (112)		20:03	20:36	20:57
21	07:41		16:02 (115)	07:07			07:20		18:26 (112)		06:28	05:51	05:40
	17:16	35	16:37 (115)	17:57			19:30	35	19:01 (112)		20:04	20:37	20:58
22	07:41		16:02 (115)	07:05			07:19		18:26 (112)		06:27	05:50	05:40
	17:18	35	16:37 (115)	17:58			19:31	35	19:01 (112)		20:05	20:38	20:58
23	07:40		16:02 (115)	07:04			07:17		18:25 (112)		06:25	05:49	05:41
	17:19	35	16:37 (115)	17:59			19:32	35	19:00 (112)		20:06	20:39	20:58
24	07:39		16:03 (115)	07:02			07:15		18:26 (112)		06:24	05:48	05:41
	17:20	35	16:38 (115)	18:00			19:34	34	19:00 (112)		20:07	20:40	20:58
25	07:38		16:04 (115)	07:00			07:13		18:26 (112)		06:22	05:48	05:41
	17:22	33	16:37 (115)	18:02			19:35	33	18:59 (112)		20:09	20:41	20:58
26	07:38		16:04 (115)	06:59			07:12		18:26 (112)		06:21	05:47	05:42
	17:23	33	16:37 (115)	18:03			19:36	32	18:58 (112)		20:10	20:41	20:59
27	07:37		16:05 (115)	06:57			07:10		18:26 (112)		06:19	05:46	05:42
	17:24	32	16:37 (115)	18:04			19:37	31	18:57 (112)		20:11	20:42	20:59
28	07:36		16:06 (115)	06:56			07:08		18:28 (112)		06:18	05:46	05:42
	17:25	30	16:36 (115)	18:05			19:38	28	18:56 (112)		20:12	20:43	20:59
29	07:35		16:07 (115)				07:06		18:28 (112)		06:16	05:45	05:43
	17:27	29	16:36 (115)				19:39	27	18:55 (112)		20:13	20:44	20:59
30	07:34		16:08 (115)				07:05		18:29 (112)		06:15	05:44	05:43
	17:28	27	16:35 (115)				19:40	23	18:52 (112)		20:14	20:45	20:59
31	07:33		16:09 (115)				07:03		18:31 (112)			05:44	
	17:29	26	16:35 (115)				19:41	19	18:50 (112)			20:46	
Potential sun hours		294		295			370		401		452		457
Total, worst case		1282		68			1011		14				
Sun reduction		0.31		0.38			0.46		0.51				
Oper. time red.		1.00		1.00			1.00		1.00				
Wind dir. red.		0.67		0.70			0.62		0.63				
Total reduction		0.21		0.27			0.29		0.32				
Total, real		269		18			289		5				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

2015-08-31_Arkwright Summit_SFA

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Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 116 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1312)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	05:44	06:09	06:42	07:14	07:34 (32)	06:50
2	05:44	06:10	06:43	07:15	07:35 (32)	06:51
3	05:45	06:11	06:44	07:16	07:36 (32)	06:53
4	05:45	06:12	06:45	07:17	07:37 (32)	06:54
5	05:46	06:13	06:46	07:18	07:38 (32)	06:55
6	05:47	06:14	06:47	07:19	07:40 (32)	06:56
7	05:47	06:15	06:48	07:20	07:41 (32)	06:58
8	05:48	06:16	06:49	07:22	07:42 (32)	06:59
9	05:49	06:17	06:50	07:23	07:43 (32)	07:00
10	05:49	06:18	06:51	07:24	07:44 (32)	07:01
11	05:50	06:19	06:52	07:25	07:45 (32)	07:03
12	05:51	06:20	06:53	07:26	07:47 (32)	07:04
13	05:52	06:22	06:54	07:27	07:49 (32)	07:05
14	05:52	06:23	06:55	07:28	07:50	07:06
15	05:53	06:24	06:57	07:30	07:52	07:08
16	05:54	06:25	06:58	07:31	07:53	07:09
17	05:55	06:26	06:59	07:32	07:54	07:10
18	05:56	06:27	07:00	07:33	07:55	07:11
19	05:57	06:28	07:01	07:34	07:56	07:12
20	05:57	06:29	07:02	07:35	07:57	07:13
21	05:58	06:30	07:03	07:36	07:58	07:14
22	05:59	06:31	07:04	07:37	07:59	07:15
23	06:00	06:32	07:05	07:38	08:00	07:16
24	06:01	06:33	07:06	07:39	08:01	07:17
25	06:02	06:34	07:07	07:40	08:02	07:18
26	06:03	06:35	07:08	07:41	08:03	07:19
27	06:04	06:36	07:09	07:42	08:04	07:20
28	06:05	06:37	07:10	07:43	08:05	07:21
29	06:06	06:38	07:11	07:44	08:06	07:22
30	06:07	06:39	07:12	07:45	08:07	07:23
31	06:08	06:41	07:14	07:47	08:09	07:25
Potential sun hours	464	431	375	343	294	283
Total, worst case			763	278	768	1622
Sun reduction			0.57	0.50	0.29	0.27
Oper. time red.			1.00	1.00	1.00	1.00
Wind dir. red.			0.62	0.60	0.69	0.64
Total reduction			0.36	0.30	0.20	0.17
Total, real			273	84	156	282

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

2015-08-31_Arkwright Summit_SFA

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Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 117 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1313)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

January		February		March		April		May		June	
1	07:47	08:34 (33)	07:32	16:30 (115)	06:54	07:14 (100)	07:01	18:40 (112)	06:14	05:43	
	16:55	27	09:01 (33)	17:31	31	17:01 (115)	18:06	19:08 (112)	20:15	20:47	
2	07:47	08:35 (33)	07:31	16:30 (115)	06:53	07:12 (100)	07:00	18:40 (112)	06:12	05:43	
	16:56	26	09:01 (33)	17:32	31	17:01 (115)	18:08	19:06 (112)	20:16	20:47	
3	07:47	08:36 (33)	07:30	16:30 (115)	06:51	07:11 (100)	06:58	18:41 (112)	06:11	05:42	
	16:57	25	09:01 (33)	17:33	32	17:02 (115)	18:09	19:05 (112)	20:18	20:48	
4	07:47	08:37 (33)	07:29	16:30 (115)	06:49	07:09 (100)	06:56	18:42 (112)	06:10	05:42	
	16:58	25	09:02 (33)	17:35	32	17:02 (115)	18:10	19:03 (112)	20:19	20:49	
5	07:47	08:38 (33)	07:28	16:29 (115)	06:48	07:07 (100)	06:54	18:44 (112)	06:08	05:42	
	16:59	24	09:02 (33)	17:36	32	17:01 (115)	18:11	19:01 (112)	20:20	20:50	
6	07:47	08:39 (33)	07:27	16:30 (115)	06:46	07:06 (32)	06:53	18:47 (112)	06:07	05:41	
	17:00	22	09:01 (33)	17:37	32	17:02 (115)	18:13	19:01 (112)	20:21	20:50	
7	07:47	08:40 (33)	07:25	16:31 (115)	06:44	07:04 (32)	06:51		06:06	05:41	
	17:01	21	09:01 (33)	17:38	31	17:02 (115)	18:14	19:02 (112)	20:22	20:51	
8	07:47	08:41 (33)	07:24	16:31 (115)	07:43	08:02 (32)	06:49		06:05	05:41	
	17:02	19	09:00 (33)	17:40	31	17:02 (115)	19:15	19:03 (112)	20:23	20:52	
9	07:47	08:42 (33)	07:23	16:31 (115)	07:41	08:01 (32)	06:48		06:03	05:40	
	17:03	18	09:00 (33)	17:41	29	17:00 (115)	19:16	19:04 (112)	20:24	20:52	
10	07:46	08:44 (33)	07:22	16:32 (115)	07:39	07:59 (32)	06:46		06:02	05:40	
	17:04	15	08:59 (33)	17:42	28	17:00 (115)	19:17	19:05 (112)	20:25	20:53	
11	07:46	08:45 (33)	07:20	16:33 (115)	07:38	07:57 (32)	06:44		06:01	05:40	
	17:05	13	08:58 (33)	17:44	27	17:00 (115)	19:18	19:06 (112)	20:26	20:54	
12	07:46	08:49 (33)	07:19	16:34 (115)	07:36	07:55 (32)	06:43		06:00	05:40	
	17:06	7	08:56 (33)	17:45	24	16:58 (115)	19:20	19:07 (112)	20:27	20:54	
13	07:45		07:18	16:35 (115)	07:34	07:54 (32)	06:41		05:59	05:40	
	17:07		17:46	16:57 (115)	19:21	08:21 (32)	19:56		20:28	20:55	
14	07:45		07:16	16:38 (115)	07:32	07:52 (32)	06:39		05:58	05:40	
	17:08		17:48	16:56 (115)	19:22	08:21 (32)	19:57		20:30	20:55	
15	07:45		07:15	16:39 (115)	07:31	07:50 (32)	06:38		05:57	05:40	
	17:09		17:49	16:53 (115)	19:23	08:20 (32)	19:58		20:31	20:56	
16	07:44		07:14	16:44 (115)	07:29	07:49 (32)	06:36		05:56	05:40	
	17:10		17:50	16:49 (115)	19:24	08:21 (32)	20:00		20:32	20:56	
17	07:44		07:12		07:27	07:47 (32)	06:34		05:55	05:40	
	17:12		17:51		19:25	08:20 (32)	20:00		20:33	20:56	
18	07:43		07:11		07:26	07:45 (32)	06:33		05:54	05:40	
	17:13		17:53		19:27	19:00 (112)	20:01		20:34	20:57	
19	07:43		07:09		07:24	07:45 (32)	06:31		05:53	05:40	
	17:14		17:54		19:28	19:04 (112)	20:02		20:35	20:57	
20	07:42		07:08		07:22	07:46 (32)	06:30		05:52	05:40	
	17:15		17:55		19:29	19:07 (112)	20:03		20:36	20:57	
21	07:41		16:40 (115)	07:07	07:20	07:46 (32)	06:28		05:51	05:40	
	17:16	5	16:45 (115)	17:57	19:30	19:08 (112)	20:04		20:37	20:58	
22	07:41		16:37 (115)	07:05	07:19	07:46 (32)	06:27		05:50	05:40	
	17:18	12	16:49 (115)	17:58	19:31	19:09 (112)	20:05		20:38	20:58	
23	07:40		16:35 (115)	07:04	07:17	07:47 (32)	06:25		05:49	05:41	
	17:19	16	16:51 (115)	17:59	1	07:25 (100)	19:32		20:39	20:58	
24	07:39		16:34 (115)	07:02	07:22 (100)	07:15	19:10 (112)		20:06		
	17:20	19	16:53 (115)	18:00	4	07:26 (100)	19:34		07:49 (32)	06:24	
25	07:38		16:33 (115)	07:00	07:20 (100)	07:13	19:11 (112)		20:07	20:58	
	17:22	22	16:55 (115)	18:02	6	07:26 (100)	19:35		07:50 (32)	06:22	
26	07:38		16:32 (115)	06:59	07:19 (100)	07:12	19:11 (112)		20:09	20:58	
	17:23	24	16:56 (115)	18:03	9	07:28 (100)	19:36		07:52 (32)	06:21	
27	07:37		16:32 (115)	06:57	07:17 (100)	07:10	19:11 (112)		20:10	20:59	
	17:24	25	16:57 (115)	18:04	10	07:27 (100)	19:37		07:56 (32)	06:19	
28	07:36		16:31 (115)	06:56	07:16 (100)	07:08	19:10 (112)		20:11	20:59	
	17:25	27	16:58 (115)	18:05	12	07:28 (100)	19:38		18:40 (112)	06:18	
29	07:35		16:30 (115)		07:06	18:39 (112)	06:16		19:11 (112)	20:12	
	17:27	29	16:59 (115)		19:39	19:10 (112)	20:13		19:11 (112)	20:12	
30	07:34		16:30 (115)		07:05	18:39 (112)	06:15		18:39 (112)	06:15	
	17:28	30	17:00 (115)		19:40	19:09 (112)	20:14		19:10 (112)	20:13	
31	07:33		16:30 (115)		07:03	18:39 (112)			18:40 (112)	06:18	
	17:29	30	17:00 (115)		19:41	19:08 (112)			19:11 (112)	20:12	
Potential sun hours	294		295		370		401		452	457	
Total, worst case		481		461		974		127			
Sun reduction		0.31		0.38		0.46		0.51			
Oper. time red.		1.00		1.00		1.00		1.00			
Wind dir. red.		0.63		0.68		0.61		0.63			
Total reduction		0.20		0.26		0.28		0.32			
Total, real		95		119		272		41			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker
			(WTG causing flicker last time)

Project:

2015-08-31_Arkwright Summit_SFA

Printed/Page

8/31/2015 1:05 PM / 49

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 117 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1313)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	05:44	06:09	06:42	07:14	07:34 (32)	06:50
2	05:49	06:39	19:53	19:00	08:00 (32)	16:02 (115)
3	05:44	06:10	06:43	07:15	07:35 (32)	16:30 (115)
4	05:48	06:38	19:51	18:58	07:58 (32)	16:01 (115)
5	05:45	06:11	06:44	07:16	07:36 (32)	16:30 (115)
6	05:48	06:37	19:49	18:57	07:57 (32)	16:00 (115)
7	05:45	06:12	06:45	07:17	07:37 (32)	16:30 (115)
8	05:48	06:36	19:48	18:55	07:56 (32)	16:01 (115)
9	05:46	06:13	06:46	07:18	07:38 (32)	16:31 (115)
10	05:49	06:34	19:46	18:53	07:54 (32)	16:00 (115)
11	05:47	06:14	06:47	18:43 (112)	07:40 (32)	16:31 (115)
12	05:48	06:33	19:44	18:54 (112)	07:57 (100)	16:00 (115)
13	05:47	06:15	06:48	18:39 (112)	07:41 (32)	16:32 (115)
14	05:49	06:32	19:43	18:56 (112)	07:58 (100)	16:00 (115)
15	05:48	06:16	06:49	18:37 (112)	07:42 (32)	16:32 (115)
16	05:49	06:17	19:41	18:58 (112)	07:59 (100)	16:00 (115)
17	05:49	06:18	06:50	18:35 (112)	07:43 (100)	16:32 (115)
18	05:49	06:19	19:39	18:59 (112)	08:00 (100)	16:01 (115)
19	05:49	06:20	19:37	18:34 (112)	07:44 (100)	16:32 (115)
20	05:49	06:21	19:36	18:59 (112)	08:00 (100)	16:01 (115)
21	05:49	06:22	19:35	18:32 (112)	07:45 (100)	16:32 (115)
22	05:49	06:23	19:34	18:59 (112)	08:01 (100)	16:01 (115)
23	05:49	06:24	19:32	18:30 (112)	07:48 (100)	16:31 (115)
24	05:49	06:25	19:31	18:56 (112)	08:01 (100)	16:02 (115)
25	05:49	06:26	19:30	18:30 (112)	07:49 (100)	16:31 (115)
26	05:49	06:27	19:28	18:59 (112)	08:00 (100)	16:02 (115)
27	05:49	06:28	19:27	18:31 (112)	07:50 (100)	16:31 (115)
28	05:49	06:29	19:26	18:58 (112)	08:00 (100)	16:02 (115)
29	05:49	06:30	19:25	18:30 (112)	07:51 (100)	16:31 (115)
30	05:49	06:31	19:24	18:59 (112)	08:00 (100)	16:02 (115)
31	05:49	06:32	19:23	18:31 (112)	07:52 (100)	16:31 (115)
32	05:49	06:33	19:22	18:58 (112)	08:00 (100)	16:02 (115)
33	05:49	06:34	19:21	18:30 (112)	07:53 (100)	16:31 (115)
34	05:49	06:35	19:20	18:59 (112)	08:00 (100)	16:02 (115)
35	05:49	06:36	19:19	18:31 (112)	07:54 (100)	16:31 (115)
36	05:49	06:37	19:18	18:58 (112)	08:00 (100)	16:02 (115)
37	05:49	06:38	19:17	18:30 (112)	07:55 (100)	16:31 (115)
38	05:49	06:39	19:16	18:59 (112)	08:00 (100)	16:02 (115)
39	05:49	06:40	19:15	18:31 (112)	07:56 (100)	16:31 (115)
40	05:49	06:41	19:14	18:58 (112)	08:00 (100)	16:02 (115)
41	05:49	06:42	19:13	18:30 (112)	07:57 (100)	16:31 (115)
42	05:49	06:43	19:12	18:59 (112)	08:00 (100)	16:02 (115)
43	05:49	06:44	19:11	18:31 (112)	07:58 (100)	16:31 (115)
44	05:49	06:45	19:10	18:58 (112)	08:00 (100)	16:02 (115)
45	05:49	06:46	19:09	18:30 (112)	07:59 (100)	16:31 (115)
46	05:49	06:47	19:08	18:59 (112)	08:00 (100)	16:02 (115)
47	05:49	06:48	19:07	18:31 (112)	07:59 (100)	16:31 (115)
48	05:49	06:49	19:06	18:58 (112)	08:00 (100)	16:02 (115)
49	05:49	06:50	19:05	18:30 (112)	07:59 (100)	16:31 (115)
50	05:49	06:51	19:04	18:59 (112)	08:00 (100)	16:02 (115)
51	05:49	06:52	19:03	18:31 (112)	07:59 (100)	16:31 (115)
52	05:49	06:53	19:02	18:58 (112)	08:00 (100)	16:02 (115)
53	05:49	06:54	19:01	18:30 (112)	07:59 (100)	16:31 (115)
54	05:49	06:55	19:00	18:59 (112)	08:00 (100)	16:02 (115)
55	05:49	06:56	18:59	18:31 (112)	07:59 (100)	16:31 (115)
56	05:49	06:57	18:58	18:59 (112)	08:00 (100)	16:02 (115)
57	05:49	06:58	18:57	18:30 (112)	07:59 (100)	16:31 (115)
58	05:49	06:59	18:56	18:59 (112)	08:00 (100)	16:02 (115)
59	05:49	07:00	18:55	18:31 (112)	07:59 (100)	16:31 (115)
60	05:49	07:01	18:54	18:59 (112)	08:00 (100)	16:02 (115)
61	05:49	07:02	18:53	18:30 (112)	07:59 (100)	16:31 (115)
62	05:49	07:03	18:52	18:59 (112)	08:00 (100)	16:02 (115)
63	05:49	07:04	18:51	18:31 (112)	07:59 (100)	16:31 (115)
64	05:49	07:05	18:50	18:59 (112)	08:00 (100)	16:02 (115)
65	05:49	07:06	18:49	18:30 (112)	07:59 (100)	16:31 (115)
66	05:49	07:07	18:48	18:59 (112)	08:00 (100)	16:02 (115)
67	05:49	07:08	18:47	18:31 (112)	07:59 (100)	16:31 (115)
68	05:49	07:09	18:46	18:59 (112)	08:00 (100)	16:02 (115)
69	05:49	07:10	18:45	18:30 (112)	07:59 (100)	16:31 (115)
70	05:49	07:11	18:44	18:59 (112)	08:00 (100)	16:02 (115)
71	05:49	07:12	18:43	18:31 (112)	07:59 (100)	16:31 (115)
72	05:49	07:13	18:42	18:59 (112)	08:00 (100)	16:02 (115)
73	05:49	07:14	18:41	18:30 (112)	07:59 (100)	16:31 (115)
74	05:49	07:15	18:40	18:59 (112)	08:00 (100)	16:02 (115)
75	05:49	07:16	18:39	18:31 (112)	07:59 (100)	16:31 (115)
76	05:49	07:17	18:38	18:59 (112)	08:00 (100)	16:02 (115)
77	05:49	07:18	18:37	18:30 (112)	07:59 (100)	16:31 (115)
78	05:49	07:19	18:36	18:59 (112)	08:00 (100)	16:02 (115)
79	05:49	07:20	18:35	18:31 (112)	07:59 (100)	16:31 (115)
80	05:49	07:21	18:34	18:59 (112)	08:00 (100)	16:02 (115)
81	05:49	07:22	18:33	18:30 (112)	07:59 (100)	16:31 (115)
82	05:49	07:23	18:32	18:59 (112)	08:00 (100)	16:02 (115)
83	05:49	07:24	18:31	18:31 (112)	07:59 (100)	16:31 (115)
84	05:49	07:25	18:30	18:59 (112)	08:00 (100)	16:02 (115)
85	05:49	07:26	18:29	18:30 (112)	07:59 (100)	16:31 (115)
86	05:49	07:27	18:28	18:59 (112)	08:00 (100)	16:02 (115)
87	05:49	07:28	18:27	18:31 (112)	07:59 (100)	16:31 (115)
88	05:49	07:29	18:26	18:59 (112)	08:00 (100)	16:02 (115)
89	05:49	07:30	18:25	18:30 (112)	07:59 (100)	16:31 (115)
90	05:49	07:31	18:24	18:59 (112)	08:00 (100)	16:02 (115)
91	05:49	07:32	18:23	18:31 (112)	07:59 (100)	16:31 (115)
92	05:49	07:33	18:22	18:59 (112)	08:00 (100)	16:02 (115)
93	05:49	07:34	18:21	18:30 (112)	07:59 (100)	16:31 (115)
94	05:49	07:35	18:20	18:59 (112)	08:00 (100)	16:02 (115)
95	05:49	07:36	18:19	18:31 (112)	07:59 (100)	16:31 (115)
96	05:49	07:37	18:18	18:59 (112)	08:00 (100)	16:02 (115)
97	05:49	07:38	18:17	18:30 (112)	07:59 (100)	16:31 (115)
98	05:49	07:39	18:16	18:59 (112)	08:00 (100)	16:02 (115)
99	05:49	07:40	18:15	18:31 (112)	07:59 (100)	16:31 (115)
100	05:49	07:41	18:14	18:59 (112)	08:00 (100)	16:02 (115)
101	05:49	07:42	18:13	18:30 (112)	07:59 (100)	16:31 (115)
102	05:49	07:43	18:12	18:59 (112)	08:00 (100)	16:02 (115)
103	05:49	07:44	18:11	18:31 (112)	07:59 (100)	16:31 (115)
104	05:49	07:45	18:10	18:59 (112)	08:00 (100)	16:02 (115)
105	05:49	07:46	18:09	18:30 (112)	07:59 (100)	16:31 (115)
106	05:49	07:47	18:08	18:59 (112)	08:00 (100)	16:02 (115)
107	05:49	07:48	18:07	18:31 (112)	07:59 (100)	16:31 (115)
108	05:49	07:49	18:06	18:59 (112)	08:00 (100)	16:02 (115)
109	05:49	07:50	18:05	18:30 (112)	07:59 (100)	16:31 (115)
110	05:49	07:51	18:04	18:59 (112)	08:00 (100)	16:02 (115)
111	05:49	07:52	18:03	18:31 (112)	07:59 (100)	16:31 (115)
112	05:49	07:53	18:02	18:59 (112)	08:00 (100)	16:02 (115)
113	05:49	07:54	18:01	18:30 (112)	07:59 (100)	16:31 (115)
114	05:49	07:55	18:00	18:59 (112)	08:00 (100)	16:02 (115)
115	05:49	07:56	17:59	18:31 (112)	07:59 (100)	16:31 (115)
116	05:49	07:57	17:58	18:59 (112)	08:00 (100)	16:02 (115)
117	05:49	07:58	17:57	18:30 (112)	07:59 (100)	16:31 (115)
118	05:49	07:59	17:56	18:59 (112)	08:00 (100)	16:02 (115)
119	05:49	08:00	17:55	18:31 (112)	07:59 (100)	16:31 (115)
120	05:49	08:01	17:54	18:59 (112)	08:00 (100)	16:02 (115)
121	05:49	08:02	17:53	18:30 (112)	07:59 (100)	16:31 (115)
122	05:49	08:03	17:52	18:59 (112)	08:00 (100)	16:02 (115)
123	05:49	08:04	17:51	18:31 (112)	07:59 (100)	16:31 (115)
124	05:49	08:05	17:50	18:59 (112)	08:00 (100)	16:02 (115)
125	05:49	08:06	17:49	18:30 (112)	07:59 (100)	16:31 (115)
126	05:49	08:07	17:48	18:59 (112)	08:00 (100)	16:02 (115)
127	05:49	08:08	17:47	18:31 (112)	07:59 (100)	16:31 (115)
128	05:49	08:09	17:46	18:59 (112)	08:00 (100)	16:02 (115)
129	05:49	08:10	17:45	18:30 (112)	07:59 (100)	16:31 (115)
130	05:49	08:11	17:44	18:59 (112)	08:00 (100)	16:02 (115)
131	05:49	08:12	17:43	18:31 (112)	07:59 (100)	16:31 (115)
132	05:49	08:13	17:42	18:59 (112)	08:00 (100)	16:02 (115)
133	05:49	08:14	17:41	18:30 (112)	07:59 (100)	16:31 (115)
134	05:49	08:15	17:40	18:59 (112)	08:00 (100)	16:02 (115)
135	05:49	08:16	17:39	18:31 (112)	07:59 (100)	16:31 (115)
136	05:49	08:17	17:38	18:59 (112)	08:00 (100)	16:02 (115)
137	05:49	08:18	17:37	18:30 (112)	07:59 (100)	16:31 (115)
138	05:49	08:19	17:36	18:59 (112)	08:00 (100)	16:02 (115)
139	05:49	08:20	17:35	18:31 (112)	07:59 (100)	16:31 (115)
140	05:49	08:21	17:34	18:59 (112)	08:00 (100)	16:02 (115)
141	05:49	08:22	17:33	18:30 (112)	07:59 (100)	16:31 (115)
142	05:49	08:23	17:32	18:59 (112)	08:00 (100)	16:02 (115)
143	05:49	08:24	17:31	18:31 (112)	07:59 (100)	16:31 (115)
144	05:49	08:25	17:30	18:59 (112)	08:00 (100)	16:02 (115)
145	05:49	08:26	17:29	18:30 (112)	07:59 (100)	16:31 (115)
146	05:49	08:27	17:28	18:59 (112)	08:00 (100)	16:02 (115)
147	05:49	08:28	17:27	18:31 (112)	07:59 (100)	16:31 (115)
148	05:49	08:29	17:26	18:59 (112)	08:00 (100)	16:02 (115)
149</						

Project:

2015-08-31_Arkwright Summit_SFA

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Licensed user:

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Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 118 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1314)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	January		February		March		April		May		June	
1	07:47		08:11 (33)	07:32		06:54		07:01		07:21 (32)	06:14	05:43
	16:55	39	08:50 (33)	17:31		18:06		19:43	50	19:21 (112)	20:15	20:47
2	07:47		08:12 (33)	07:31		06:53		07:00		07:19 (32)	06:12	05:43
	16:56	38	08:50 (33)	17:32		18:08		19:44	55	19:22 (112)	20:16	20:47
3	07:47		08:12 (33)	07:30		06:51		06:58		07:19 (32)	06:11	05:42
	16:57	39	08:51 (33)	17:33		18:09		19:45	57	19:23 (112)	20:18	20:48
4	07:47		08:13 (33)	07:29		06:49		06:56		07:19 (32)	06:10	05:42
	16:58	38	08:51 (33)	17:35		18:10		19:46	57	19:23 (112)	20:19	20:49
5	07:47		08:13 (33)	07:28		06:48		06:54		07:20 (32)	06:08	05:42
	16:59	39	08:52 (33)	17:36		18:11	2	07:09 (100)	58	19:25 (112)	20:20	20:50
6	07:47		08:14 (33)	07:27	17:04 (115)	06:46		07:06 (100)	58	07:20 (32)	06:07	05:41
	17:00	38	08:52 (33)	17:37	17:07 (115)	18:13	4	07:10 (100)	58	19:26 (112)	20:21	20:50
7	07:47		08:14 (33)	07:25	16:59 (115)	06:44		07:04 (100)	57	07:21 (32)	06:06	05:41
	17:01	39	08:53 (33)	17:38	17:12 (115)	18:14	7	07:11 (100)	57	19:26 (112)	20:22	20:51
8	07:47		08:14 (33)	07:24	16:57 (115)	07:43		08:02 (100)	53	07:23 (32)	06:05	05:41
	17:02	39	08:53 (33)	17:40	17:15 (115)	19:15	9	08:11 (100)	53	19:26 (112)	20:23	20:52
9	07:47		08:15 (33)	07:23	16:55 (115)	07:41		08:01 (100)	51	07:24 (32)	06:03	05:40
	17:03	38	08:53 (33)	17:41	17:16 (115)	19:16	11	08:12 (100)	51	19:26 (112)	20:24	20:52
10	07:46		08:15 (33)	07:22	16:54 (115)	07:39		07:59 (100)	45	07:26 (32)	06:02	05:40
	17:04	39	08:54 (33)	17:42	17:18 (115)	19:17	12	08:11 (100)	45	19:25 (112)	20:25	20:53
11	07:46		08:15 (33)	07:20	16:53 (115)	07:38		07:57 (100)	35	07:31 (32)	06:01	05:40
	17:05	39	08:54 (33)	17:44	17:19 (115)	19:18	14	08:11 (100)	35	19:25 (112)	20:26	20:54
12	07:46		08:16 (33)	07:19	16:51 (115)	07:36		07:55 (100)	29	18:55 (112)	06:00	05:40
	17:06	38	08:54 (33)	17:45	17:20 (115)	19:20	15	08:10 (100)	29	19:24 (112)	20:27	20:54
13	07:45		08:17 (33)	07:18	16:51 (115)	07:34		07:54 (100)	28	18:55 (112)	05:59	05:40
	17:07	38	08:55 (33)	17:46	17:21 (115)	19:21	16	08:10 (100)	28	19:23 (112)	20:28	20:55
14	07:45		08:17 (33)	07:16	16:51 (115)	07:32		07:52 (100)	27	18:56 (112)	05:58	05:40
	17:08	38	08:55 (33)	17:48	17:22 (115)	19:22	16	08:08 (100)	27	19:23 (112)	20:30	20:55
15	07:45		08:18 (33)	07:15	16:50 (115)	07:31		07:50 (100)	25	18:56 (112)	05:57	05:40
	17:09	37	08:55 (33)	17:49	17:22 (115)	19:23	17	08:07 (100)	25	19:21 (112)	20:31	20:56
16	07:44		08:18 (33)	07:14	16:50 (115)	07:29		07:49 (100)	23	18:58 (112)	05:56	05:40
	17:10	37	08:55 (33)	17:50	17:22 (115)	19:24	17	08:06 (100)	23	19:21 (112)	20:32	20:56
17	07:44		08:19 (33)	07:12	16:49 (115)	07:27		07:51 (100)	21	18:58 (112)	05:55	05:40
	17:12	37	08:56 (33)	17:51	17:22 (115)	19:25	12	08:03 (100)	21	19:19 (112)	20:33	20:56
18	07:43		08:20 (33)	07:11	16:50 (115)	07:26		07:54 (100)	17	18:59 (112)	05:54	05:40
	17:13	35	08:55 (33)	17:53	17:22 (115)	19:27	4	07:58 (100)	17	19:16 (112)	20:34	20:57
19	07:43		08:20 (33)	07:09	16:50 (115)	07:24		06:31	12	19:02 (112)	05:53	05:40
	17:14	35	08:55 (33)	17:54	17:23 (115)	19:28		20:02	12	19:14 (112)	20:35	20:57
20	07:42		08:21 (33)	07:08	16:50 (115)	07:22		07:42 (32)		05:52		05:40
	17:15	34	08:55 (33)	17:55	17:22 (115)	19:29	6	07:48 (32)		20:36		20:57
21	07:41		08:22 (33)	07:07	16:51 (115)	07:20		07:40 (32)		05:51		05:40
	17:16	33	08:55 (33)	17:57	17:22 (115)	19:30	10	07:50 (32)		20:37		20:58
22	07:41		08:23 (33)	07:05	16:51 (115)	07:19		07:38 (32)		05:50		05:40
	17:18	31	08:54 (33)	17:58	17:21 (115)	19:31	14	07:52 (32)		20:38		20:58
23	07:40		08:23 (33)	07:04	16:51 (115)	07:17		07:36 (32)		05:49		05:41
	17:19	31	08:54 (33)	17:59	17:20 (115)	19:32	17	07:53 (32)		20:39		20:58
24	07:39		08:25 (33)	07:02	16:52 (115)	07:15		07:35 (32)		05:48		05:41
	17:20	29	08:54 (33)	18:00	17:19 (115)	19:34	19	07:54 (32)		20:40		20:58
25	07:38		08:26 (33)	07:00	16:53 (115)	07:13		07:33 (32)		05:48		05:41
	17:22	27	08:53 (33)	18:02	17:18 (115)	19:35	22	07:55 (32)		20:41		20:58
26	07:38		08:28 (33)	06:59	16:55 (115)	07:12		07:31 (32)		05:47		05:42
	17:23	24	08:52 (33)	18:03	17:17 (115)	19:36	24	07:55 (32)		20:41		20:59
27	07:37		08:29 (33)	06:57	16:56 (115)	07:10		07:29 (32)		05:46		05:42
	17:24	21	08:50 (33)	18:04	17:14 (115)	19:37	26	07:55 (32)		20:42		20:59
28	07:36		08:31 (33)	06:56	16:59 (115)	07:08		07:28 (32)		05:46		05:42
	17:25	18	08:49 (33)	18:05	17:12 (115)	19:38	28	07:56 (32)		20:43		20:59
29	07:35		08:34 (33)			07:06		07:26 (32)		05:45		05:43
	17:27	12	08:46 (33)			19:39	29	07:55 (32)		20:44		20:59
30	07:34					07:05		07:24 (32)		05:44		05:43
	17:28					19:40	31	07:55 (32)		20:45		20:59
31	07:33					07:03		07:22 (32)		05:44		
	17:29					19:41	44	19:19 (112)		20:46		
Potential sun hours	294		295			370		401		452		457
Total, worst case	980		584			426		758				
Sun reduction	0.31		0.38			0.46		0.51				
Oper. time red.	1.00		1.00			1.00		1.00				
Wind dir. red.	0.57		0.68			0.61		0.61				
Total reduction	0.18		0.26			0.28		0.31				
Total, real	173		149			119		235				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

2015-08-31_Arkwright Summit_SFA

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Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 118 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1314)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

July		August		September		October		November		December	
1	05:44	06:09		06:42	07:30 (32)	07:14		07:34 (100)	06:50	16:24 (115)	07:26
2	05:44	06:10		06:43	07:25 (32)	07:15		07:35 (100)	06:51	16:25 (115)	07:28
3	05:45	06:11		06:44	07:22 (32)	07:16		07:36 (100)	06:53	16:26 (115)	07:29
4	05:45	06:12		06:45	07:20 (32)	07:17		07:37 (100)	06:54	16:29 (115)	07:30
5	05:46	06:13		06:46	07:18 (32)	07:18		07:38 (100)	06:55	16:42 (115)	07:31
6	05:47	06:14		06:47	07:16 (32)	07:19		07:40 (100)	06:56		07:32
7	05:47	06:15		06:48	07:15 (32)	07:20		07:41 (100)	06:58		07:33
8	05:48	06:16		06:49	07:14 (32)	07:22		07:42 (100)	06:59		07:34
9	05:49	06:17		06:50	07:13 (32)	07:23		07:45 (100)	07:00		07:34
10	05:49	06:18		06:51	07:12 (32)	07:24			07:01		07:35
11	05:50	06:19		06:52	07:13 (32)	07:25			07:03		07:36
12	05:51	06:20		06:53	07:14 (32)	07:26			07:04		07:37
13	05:52	06:22		06:54	07:15 (32)	07:27		17:34 (115)	07:05	08:06 (33)	07:38
14	05:52	06:23		06:55	07:16 (32)	07:28		17:30 (115)	07:06	08:03 (33)	07:39
15	05:53	06:24		06:56	07:17 (32)	07:30		17:28 (115)	07:08	08:02 (33)	07:39
16	05:53	06:25		06:57	07:18 (32)	07:31		17:25 (115)	07:09	08:01 (33)	07:40
17	05:55	06:26		06:58	07:19 (32)	07:32		17:21 (115)	07:10	07:59 (33)	07:41
18	05:56	06:27		06:59	07:20 (32)	07:33		17:19 (115)	07:11	07:58 (33)	07:42
19	05:57	06:28		07:00	07:21 (32)	07:34		17:17 (115)	07:12	07:57 (33)	07:43
20	05:57	06:29		07:01	07:22 (32)	07:35		17:15 (115)	07:13	07:56 (33)	07:44
21	05:58	06:30		07:02	07:23 (32)	07:36		17:13 (115)	07:14	07:55 (33)	07:45
22	05:59	06:31		07:03	07:24 (32)	07:37		17:11 (115)	07:15	07:54 (33)	07:46
23	06:00	06:32		07:04	07:25 (32)	07:38		17:09 (115)	07:16	07:53 (33)	07:47
24	06:01	06:33		07:05	07:26 (32)	07:39		17:07 (115)	07:17	07:52 (33)	07:48
25	06:02	06:34		07:06	07:27 (32)	07:40		17:05 (115)	07:18	07:51 (33)	07:49
26	06:03	06:35		07:07	07:28 (32)	07:41		17:03 (115)	07:19	07:50 (33)	07:50
27	06:04	06:36		07:08	07:29 (32)	07:42		17:01 (115)	07:20	07:49 (33)	07:51
28	06:05	06:37		07:09	07:30 (32)	07:43		16:59 (115)	07:21	07:48 (33)	07:52
29	06:06	06:38		07:10	07:31 (32)	07:44		16:57 (115)	07:22	07:47 (33)	07:53
30	06:07	06:39		07:11	07:32 (32)	07:45		16:55 (115)	07:23	07:46 (33)	07:54
31	06:08	06:40		07:12	07:33 (32)	07:46		16:53 (115)	07:24	07:45 (33)	07:55
Potential sun hours	464	431		375	343	294		283			
Total, worst case		183		929	599	629		1176			
Sun reduction		0.64		0.57	0.50	0.29		0.27			
Oper. time red.		1.00		1.00	1.00	1.00		1.00			
Wind dir. red.		0.61		0.62	0.67	0.59		0.57			
Total reduction		0.39		0.35	0.33	0.17		0.15			
Total, real		71		323	198	106		181			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

2015-08-31_Arkwright Summit_SFA

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Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 119 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1315)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

January		February		March		April		May		June	
1	07:47	15:44 (115)	07:32	07:53 (32)	06:54	17:04 (112)	07:01	06:14	05:43		
	16:55	23	16:07 (115)	17:31	08:06 (32)	18:06	27	17:31 (112)	19:43	20:15	20:47
2	07:47	15:44 (115)	07:31	07:52 (32)	06:53	17:04 (112)	07:00	06:12	05:43		
	16:56	23	16:07 (115)	17:32	08:07 (32)	18:08	26	17:30 (112)	19:44	20:16	20:47
3	07:47	15:45 (115)	07:30	07:51 (32)	06:51	17:06 (112)	06:58	06:11	05:42		
	16:57	22	16:07 (115)	17:33	08:08 (32)	18:09	23	17:29 (112)	19:45	20:18	20:48
4	07:47	15:46 (115)	07:29	07:50 (32)	06:49	17:07 (112)	06:56	06:10	05:42		
	16:58	21	16:07 (115)	17:35	08:09 (32)	18:10	20	17:27 (112)	19:46	20:19	20:49
5	07:47	15:47 (115)	07:28	07:48 (32)	06:48	17:08 (112)	06:54	06:08	05:42		
	16:59	20	16:07 (115)	17:36	08:09 (32)	18:11	17	17:25 (112)	19:47	20:20	20:50
6	07:47	15:48 (115)	07:27	07:47 (32)	06:46	17:11 (112)	06:53	06:07	05:41		
	17:00	19	16:07 (115)	17:37	08:10 (32)	18:13	12	17:23 (112)	19:48	20:21	20:50
7	07:47	15:50 (115)	07:25	07:46 (32)	06:44		06:51	06:06	05:41		
	17:01	17	16:07 (115)	17:38	08:11 (32)	18:14		19:49	20:22	20:51	
8	07:47	15:50 (115)	07:24	07:45 (32)	07:43		06:49	06:05	05:41		
	17:02	16	16:06 (115)	17:40	08:11 (32)	19:15		19:51	20:23	20:52	
9	07:47	15:52 (115)	07:23	07:43 (32)	07:41		06:48	06:03	05:40		
	17:03	14	16:06 (115)	17:41	08:11 (32)	19:16		19:52	20:24	20:52	
10	07:46	15:54 (115)	07:22	07:42 (32)	07:39		06:46	06:02	05:40		
	17:04	11	16:05 (115)	17:42	08:11 (32)	19:17		19:53	20:25	20:53	
11	07:46	15:56 (115)	07:20	07:41 (32)	07:38		06:44	06:01	05:40		
	17:05	8	16:04 (115)	17:44	08:12 (32)	19:18		19:54	20:26	20:54	
12	07:46		07:19	07:39 (32)	07:36		06:43	06:00	05:40		
	17:06		17:45	08:11 (32)	19:20		19:55	20:27	20:54		
13	07:45		07:18	07:39 (32)	07:34		06:41	05:59	05:40		
	17:07		17:46	08:11 (32)	19:21		19:56	20:28	20:55		
14	07:45		07:16	07:40 (32)	07:32		06:39	05:58	05:40		
	17:08		17:48	08:11 (32)	19:22		19:57	20:30	20:55		
15	07:45		07:15	07:40 (32)	07:31		06:38	05:57	05:40		
	17:09		17:49	35	17:21 (112)	19:23		19:58	20:31	20:56	
16	07:44		07:14	07:41 (32)	07:29		06:36	05:56	05:40		
	17:10		17:50	43	17:26 (112)	19:24		20:00	20:32	20:56	
17	07:44		07:12	07:42 (32)	07:27		06:34	05:55	05:40		
	17:12		17:51	44	17:27 (112)	19:25		20:00	20:33	20:56	
18	07:43		07:11	07:43 (32)	07:26		06:33	05:54	05:40		
	17:13		17:53	45	17:29 (112)	19:27		20:01	20:34	20:57	
19	07:43		07:09	07:45 (32)	07:24		06:31	05:53	05:40		
	17:14		17:54	45	17:31 (112)	19:28		20:02	20:35	20:57	
20	07:42		07:08	07:46 (32)	07:22		06:30	05:52	05:40		
	17:15		17:55	43	17:31 (112)	19:29		20:03	20:36	20:57	
21	07:41		07:07	07:49 (32)	07:20		06:28	05:51	05:40		
	17:16		17:57	40	17:33 (112)	19:30		20:04	20:37	20:58	
22	07:41		07:05	17:04 (112)	07:19		06:27	05:50	05:40		
	17:18		17:58	29	17:33 (112)	19:31		20:05	20:38	20:58	
23	07:40		07:04	17:04 (112)	07:17		06:25	05:49	05:41		
	17:19		17:59	29	17:33 (112)	19:32		20:06	20:39	20:58	
24	07:39		07:02	17:04 (112)	07:15		06:24	05:48	05:41		
	17:20		18:00	29	17:33 (112)	19:34		20:07	20:40	20:58	
25	07:38		07:00	17:03 (112)	07:13		06:22	05:48	05:41		
	17:22		18:02	30	17:33 (112)	19:35		20:09	20:41	20:58	
26	07:38		06:59	17:03 (112)	07:12		06:21	05:47	05:42		
	17:23		18:03	30	17:33 (112)	19:36		20:10	20:41	20:59	
27	07:37		06:57	17:03 (112)	07:10		06:19	05:46	05:42		
	17:24		18:04	29	17:32 (112)	19:37		20:11	20:42	20:59	
28	07:36		06:56	17:04 (112)	07:08		06:18	05:46	05:42		
	17:25		18:05	28	17:32 (112)	19:38		20:12	20:43	20:59	
29	07:35		07:56 (32)		07:06		06:16	05:45	05:43		
	17:27	3	07:59 (32)		19:39		20:13	20:44	20:59		
30	07:34		07:55 (32)		07:05		06:15	05:44	05:43		
	17:28	7	08:02 (32)		19:40		20:14	20:45	20:59		
31	07:33		07:54 (32)		07:03			05:44			
	17:29	10	08:04 (32)		19:41			20:46			
Potential sun hours	294		295		370		401	452	457		
Total, worst case		214		841		125					
Sun reduction		0.31		0.38		0.46					
Oper. time red.		1.00		1.00		1.00					
Wind dir. red.		0.70		0.62		0.67					
Total reduction		0.22		0.24		0.31					
Total, real		47		199		39					

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
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Project:

2015-08-31_Arkwright Summit_SFA

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Licensed user:

EDR217 Montgomery St.
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Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 119 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1315)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	05:44	06:09	06:42	07:14	06:50	07:12 (32) 07:26
2	05:44	06:09	06:42	07:14	06:50	07:12 (32) 07:26
3	05:45	06:11	06:44	07:16	06:53	07:15 (32) 07:29
4	05:45	06:12	06:45	07:17	06:54	07:16 (32) 07:30
5	05:46	06:13	06:46	07:18	06:55	07:17 (32) 07:31
6	05:47	06:14	06:47	07:19	06:56	07:19 (32) 07:32
7	05:47	06:15	06:48	07:20	06:58	07:20 (32) 07:33
8	05:48	06:16	06:49	07:22	06:59	07:21 (32) 07:34
9	05:49	06:17	06:50	07:23	07:00	07:23 (32) 07:34
10	05:49	06:18	06:51	07:24	07:01	07:24 (32) 07:35
11	05:50	06:19	06:52	07:25	07:03	07:25 (32) 07:36
12	05:51	06:20	06:53	07:26	07:04	07:27 (32) 07:37
13	05:52	06:22	06:54	07:27	07:05	07:28 (32) 07:38
14	05:52	06:23	06:55	07:28	07:06	07:31 (32) 07:39
15	05:53	06:24	06:57	07:30	07:08	07:39
16	05:54	06:25	06:58	07:31	07:09	07:40
17	05:55	06:26	06:59	07:32	07:10	07:41
18	05:56	06:27	07:00	07:33	07:11	07:41
19	05:57	06:28	07:01	07:34	07:12	07:42
20	05:57	06:29	07:02	07:35	07:14	07:43
21	05:58	06:30	07:03	07:37	07:15	07:43
22	05:59	06:31	07:04	07:38	07:16	07:44
23	06:00	06:32	07:05	07:39	07:17	07:44
24	06:01	06:33	07:06	07:40	07:18	07:45
25	06:02	06:34	07:07	07:41	07:20	07:45
26	06:03	06:35	07:08	07:43	07:21	07:45
27	06:04	06:36	07:09	07:44	07:22	07:46
28	06:05	06:37	07:10	07:45	07:23	07:46
29	06:06	06:38	07:12	07:46	07:24	07:46
30	06:07	06:40	07:13	07:48	07:25	07:47
31	06:08	06:41	07:14	07:49	07:26	07:47
Potential sun hours	464	431	375	343	294	283
Total, worst case				768	235	694
Sun reduction				0.50	0.29	0.27
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.63	0.58	0.71
Total reduction				0.32	0.17	0.19
Total, real				246	40	134

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

2015-08-31_Arkwright Summit_SFA

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Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 121 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1317)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	January		February		March		April		May		June	
1	07:47		07:32		07:53 (32)	06:54		07:01		06:14		05:43
	16:55		17:31	56	16:54 (112)	18:06		19:43		20:15		20:47
2	07:47		07:31		07:52 (32)	06:53		07:00		06:12		05:43
	16:56		17:32	57	16:54 (112)	18:08		19:44		20:16		20:47
3	07:47		07:30		07:51 (32)	06:51		06:58		06:11		05:42
	16:57		17:33	57	16:54 (112)	18:09		19:45		20:18		20:48
4	07:47		07:29		07:50 (32)	06:49		06:56		06:10		05:42
	16:58		17:35	57	16:54 (112)	18:10		19:46		20:19		20:49
5	07:47		07:28		07:49 (32)	06:48		17:48 (43)		06:54		05:42
	16:59		17:36	57	16:53 (112)	18:11	1	17:49 (43)		19:47		20:50
6	07:47		07:27		07:50 (32)	06:46		17:45 (43)		06:53		05:41
	17:00		17:37	54	16:53 (112)	18:13	6	17:51 (43)		19:48		20:51
7	07:47		07:25		07:51 (32)	06:44		17:43 (43)		06:51	19:25 (101)	06:06
	17:01		17:38	51	16:52 (112)	18:14	9	17:52 (43)		19:49	2	19:27 (101)
8	07:47		07:24		07:53 (32)	07:43		18:41 (43)		06:49	19:23 (101)	06:05
	17:02		17:40	46	16:52 (112)	19:15	12	18:53 (43)		19:51	6	19:29 (101)
9	07:47		07:23		07:54 (32)	07:41		18:40 (43)		06:48	19:21 (101)	06:03
	17:03		17:41	41	16:50 (112)	19:16	15	18:55 (43)		19:52	8	19:29 (101)
10	07:46		07:22		07:56 (32)	07:39		18:39 (43)		06:46	19:19 (101)	06:02
	17:04		17:42	34	16:49 (112)	19:17	17	18:56 (43)		19:53	11	19:30 (101)
11	07:46		07:20		08:00 (32)	07:38		18:38 (43)		06:44	19:18 (101)	06:01
	17:05		17:44	24	16:48 (112)	19:18	18	18:56 (43)		19:54	14	19:32 (101)
12	07:46		07:19		16:30 (112)	07:36		18:37 (43)		06:43	19:17 (101)	06:00
	17:06		17:45	15	16:45 (112)	19:20	20	18:57 (43)		19:55	16	19:33 (101)
13	07:45		07:18		16:35 (112)	07:34		18:38 (43)		06:41	19:16 (101)	05:59
	17:07		17:46	6	16:41 (112)	19:21	21	18:59 (43)		19:56	17	19:33 (101)
14	07:45					07:32		18:38 (43)		06:39	19:16 (101)	05:58
	17:08	7	16:28 (112)		07:16	19:22	22	19:00 (43)		19:57	19	19:35 (101)
15	07:45		16:27 (112)		07:15	07:31		18:37 (43)		06:38	19:16 (101)	05:57
	17:09	12	16:39 (112)		17:49	19:23	23	19:00 (43)		19:58	20	19:36 (101)
16	07:44		16:25 (112)		07:14	07:29		18:39 (43)		06:36	19:16 (101)	05:56
	17:10	15	16:40 (112)		17:50	19:24	20	18:59 (43)		20:00	21	19:37 (101)
17	07:44		16:24 (112)		07:12	07:27		18:39 (43)		06:34	19:16 (101)	05:55
	17:12	19	16:43 (112)		17:51	19:25	19	18:58 (43)		20:00	22	19:38 (101)
18	07:43		16:23 (112)		07:11	07:26		18:40 (43)		06:33	19:16 (101)	05:54
	17:13	21	16:44 (112)		17:53	19:27	16	18:56 (43)		20:01	22	19:38 (101)
19	07:43		16:22 (112)		07:09	07:24		18:42 (43)		06:31	19:17 (101)	05:53
	17:14	23	16:45 (112)		17:54	19:28	11	18:53 (43)		20:02	20	19:37 (101)
20	07:42		16:22 (112)		07:08	07:22				06:30	19:18 (101)	05:52
	17:15	25	16:47 (112)		17:55	19:29				20:03	17	19:35 (101)
21	07:41		08:03 (32)		07:07	07:20				06:28	19:19 (101)	05:51
	17:16	29	16:47 (112)		17:57	19:30				20:04	15	19:34 (101)
22	07:41		08:02 (32)		07:05	07:19				06:27	19:21 (101)	05:50
	17:18	33	16:48 (112)		17:58	19:31				20:05	10	19:31 (101)
23	07:40		08:01 (32)		07:04	07:17				06:25		05:49
	17:19	36	16:49 (112)		17:59	19:32				20:06		20:39
24	07:39		08:01 (32)		07:02	07:15				06:24		05:48
	17:20	40	16:51 (112)		18:00	19:34				20:07		20:40
25	07:38		08:00 (32)		07:00	07:13				06:22		05:48
	17:22	42	16:51 (112)		18:02	19:35				20:09		20:41
26	07:38		07:59 (32)		06:59	07:12				06:21		05:47
	17:23	45	16:52 (112)		18:03	19:36				20:10		20:41
27	07:37		07:58 (32)		06:57	07:10				06:19		05:46
	17:24	47	16:52 (112)		18:04	19:37				20:11		20:42
28	07:36		07:57 (32)		06:56	07:08				06:18		05:46
	17:25	50	16:53 (112)		18:05	19:38				20:12		20:43
29	07:35		07:56 (32)			07:06				06:16		05:45
	17:27	52	16:53 (112)			19:39				20:13		20:44
30	07:34		07:55 (32)			07:05				06:15		05:44
	17:28	52	16:53 (112)			19:40				20:14		20:45
31	07:33		07:54 (32)			07:03						05:44
	17:29	55	16:54 (112)			19:41						20:46
Potential sun hours		294		295		370			401		452	457
Total, worst case		603		555		230			240			
Sun reduction		0.31		0.38		0.46			0.51			
Oper. time red.		1.00		1.00		1.00			1.00			
Wind dir. red.		0.66		0.65		0.63			0.59			
Total reduction		0.21		0.25		0.29			0.31			
Total, real		125		138		67			73			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

2015-08-31_Arkwright Summit_SFA

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Licensed user:

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Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 121 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1317)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

July		August		September		October		November		December	
1	05:44	06:09		06:42	19:17 (101)	07:14		18:17 (43)	06:50	07:25 (32)	07:26
	20:59	20:39		19:53	19:31 (101)	19:00	21	18:38 (43)	17:12	16:19 (112)	16:46
2	05:44	06:10		06:43	19:18 (101)	07:15		18:17 (43)	06:51	07:23 (32)	07:28
	20:58	20:38		19:51	19:29 (101)	18:58	19	18:36 (43)	17:10	16:20 (112)	16:46
3	05:45	06:11		06:44	19:19 (101)	07:16		18:16 (43)	06:53	07:22 (32)	07:29
	20:58	20:37		19:49	19:27 (101)	18:57	18	18:34 (43)	17:09	16:22 (112)	16:45
4	05:45	06:12		06:45	19:20 (101)	07:17		18:16 (43)	06:54	07:21 (32)	07:30
	20:58	20:36		19:48	19:26 (101)	18:55	16	18:32 (43)	17:08	16:22 (112)	16:45
5	05:46	06:13		06:46	19:22 (101)	07:18		18:17 (43)	06:55	07:20 (32)	07:31
	20:58	20:34		19:46	19:24 (101)	18:53	13	18:30 (43)	17:07	16:23 (112)	16:45
6	05:47	06:14		06:47		07:19		18:19 (43)	06:56	07:20 (32)	07:32
	20:58	20:33		19:44		18:52	10	18:29 (43)	17:05	16:24 (112)	16:45
7	05:47	06:15		06:48		07:20		18:20 (43)	06:58	07:20 (32)	07:33
	20:57	20:32		19:43		18:50	7	18:27 (43)	17:04	16:24 (112)	16:45
8	05:48	06:16		06:49		07:22		18:22 (43)	06:59	07:21 (32)	07:34
	20:57	20:31		19:41		18:48	3	18:25 (43)	17:03	16:24 (112)	16:45
9	05:49	06:17		06:50		07:23			07:00	07:23 (32)	07:34
	20:57	20:29		19:39		18:47			17:02	16:25 (112)	16:45
10	05:49	06:18		06:51		07:24			07:01	07:24 (32)	07:35
	20:56	20:28		19:37		18:45			17:01	16:25 (112)	16:45
11	05:50	06:19		06:52		07:25			07:03	07:25 (32)	07:36
	20:56	20:27		19:36		18:43			17:00	16:25 (112)	16:45
12	05:51	06:20		06:53		07:26			07:04	07:27 (32)	07:37
	20:55	20:25		19:34		18:42			16:59	16:25 (112)	16:45
13	05:52	06:22		06:54		07:27			07:05	07:28 (32)	07:38
	20:55	20:24		19:32		18:40			16:58	16:25 (112)	16:45
14	05:52	06:23		06:55		07:28			07:06	07:29 (32)	07:39
	20:54	20:23		19:30		18:38			16:57	16:25 (112)	16:45
15	05:53	06:24		06:57		07:30			07:08	07:31 (32)	07:39
	20:54	20:21		19:28		18:37			16:56	16:25 (112)	16:45
16	05:54	06:25		06:58		07:31			07:09	07:32 (32)	07:40
	20:53	20:20		19:27		18:35			16:55	16:25 (112)	16:46
17	05:55	06:26		06:59		07:32			07:10	07:33 (32)	07:41
	20:52	20:18		19:25		18:33			16:54	16:24 (112)	16:46
18	05:56	06:27		07:00		07:33			07:11	07:35 (32)	07:41
	20:52	20:17		19:23		18:32			16:53	16:25 (112)	16:46
19	05:57	06:28		07:01		07:34			07:12	07:36 (32)	07:42
	20:51	20:15		19:21		18:30			16:53	16:24 (112)	16:47
20	05:57	06:29	19:31 (101)	07:02		07:35			07:14	07:37 (32)	07:43
	20:50	20:14	2	19:33 (101)	19:20	18:29			16:52	16:23 (112)	16:47
21	05:58	06:30	19:26 (101)	07:03		07:37			07:15	07:38 (32)	07:43
	20:50	20:12	11	19:37 (101)	19:18	18:27			16:51	16:23 (112)	16:47
22	05:59	06:31	19:24 (101)	07:04		07:38			07:16	15:58 (112)	07:44
	20:49	20:11	15	19:39 (101)	19:16	18:26			16:50	16:23 (112)	16:48
23	06:00	06:32	19:22 (101)	07:05		07:39			07:17	15:59 (112)	07:44
	20:48	20:09	18	19:40 (101)	19:14	18:24			16:50	16:22 (112)	16:48
24	06:01	06:33	19:21 (101)	07:06	18:27 (43)	07:40			07:19	16:00 (112)	07:45
	20:47	20:08	20	19:41 (101)	19:13	18:23			16:49	16:21 (112)	16:49
25	06:02	06:34	19:20 (101)	07:07	18:23 (43)	07:41			07:20	16:01 (112)	07:45
	20:46	20:06	21	19:41 (101)	19:11	18:37 (43)	14		16:49	16:20 (112)	16:50
26	06:03	06:35	19:19 (101)	07:08	18:22 (43)	07:43			07:21	16:04 (112)	07:45
	20:45	20:04	22	19:41 (101)	19:09	18:40 (43)	18		16:48	16:19 (112)	16:50
27	06:04	06:36	19:18 (101)	07:09	18:21 (43)	07:44			07:22	16:06 (112)	07:46
	20:44	20:03	21	19:39 (101)	19:07	18:40 (43)	19		16:48	16:18 (112)	16:51
28	06:05	06:37	19:18 (101)	07:10	18:19 (43)	07:45			07:23	16:08 (112)	07:46
	20:43	20:01	19	19:37 (101)	19:05	18:41 (43)	22		16:47	16:15 (112)	16:52
29	06:06	06:39	19:17 (101)	07:12	18:18 (43)	07:46			17:03 (112)	07:24	07:46
	20:42	19:58	19	19:36 (101)	19:04	18:16	9		17:12 (112)	16:47	16:52
30	06:07	06:40	19:17 (101)	07:13	18:17 (43)	07:48			17:00 (112)	07:25	07:47
	20:41	19:56	17	19:34 (101)	19:02	18:39 (43)	15		17:15 (112)	16:46	16:53
31	06:08	06:41	19:17 (101)			07:49			08:29 (32)		07:47
	20:40	19:54	15	19:32 (101)		18:13	27		17:18 (112)		16:54
Potential sun hours	464	431		375		343			294		283
Total, worst case			200		167		158			1120	
Sun reduction			0.64		0.57		0.50			0.29	
Oper. time red.			1.00		1.00		1.00			1.00	
Wind dir. red.			0.59		0.62		0.65			0.66	
Total reduction			0.38		0.36		0.33			0.19	
Total, real			77		60		51			215	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

2015-08-31_Arkwright Summit_SFA

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Licensed user:

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Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 124 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1320)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

January		February		March	April	May	June	
1	07:47	15:49 (112)	07:32	06:54	07:01	06:14	05:43	06:06 (36)
	16:55	21	16:10 (112)	17:31	18:06	19:43	20:15	45 20:16 (51)
2	07:47		15:50 (112)	07:31	06:53	07:00	06:12	05:43 06:05 (36)
	16:56	20	16:10 (112)	17:32	18:08	19:44	20:16	20:47 47 20:16 (51)
3	07:47		15:51 (112)	07:30	06:51	06:58	06:11	05:42 06:05 (36)
	16:57	19	16:10 (112)	17:33	18:09	19:45	20:18	20:48 48 20:16 (51)
4	07:47		15:52 (112)	07:29	06:49	06:56	06:10	05:42 06:04 (36)
	16:58	18	16:10 (112)	17:35	18:10	19:46	20:19	20:49 48 20:15 (51)
5	07:47		15:53 (112)	07:28	06:48	06:54	06:08	05:42 06:04 (36)
	16:59	17	16:10 (112)	17:36	18:11	19:47	20:20	20:50 50 20:16 (51)
6	07:47		15:54 (112)	07:27	06:46	06:53	06:07	05:41 06:04 (36)
	17:00	16	16:10 (112)	17:37	18:13	19:48	20:21	20:50 50 20:16 (51)
7	07:47		15:55 (112)	07:25	06:44	06:51	06:06	05:41 06:03 (36)
	17:01	15	16:10 (112)	17:38	18:14	19:49	20:22	20:51 51 20:16 (51)
8	07:47		15:56 (112)	07:24	07:43	06:49	06:05	05:41 06:03 (36)
	17:02	13	16:09 (112)	17:40	19:15	19:51	20:23	20:52 52 20:16 (51)
9	07:47		15:57 (112)	07:23	07:41	06:48	06:03	05:40 06:03 (36)
	17:03	12	16:09 (112)	17:41	19:16	19:52	20:24	20:52 52 20:16 (51)
10	07:46		15:59 (112)	07:22	07:39	06:46	06:02	05:40 06:03 (36)
	17:04	9	16:08 (112)	17:42	19:17	19:53	20:25	20:53 53 20:16 (51)
11	07:46		16:03 (112)	07:20	07:38	06:44	06:01	19:53 (51) 05:40 06:03 (36)
	17:05	3	16:06 (112)	17:44	19:18	19:54	20:26	10 20:03 (51) 20:54 52 20:16 (51)
12	07:46			07:19	07:36	06:43	06:00	19:50 (51) 05:40 06:03 (36)
	17:06			17:45	19:20	19:55	20:27	14 20:04 (51) 20:54 54 20:17 (51)
13	07:45			07:18	07:34	06:41	05:59	19:49 (51) 05:40 06:03 (36)
	17:07			17:46	19:21	19:56	20:28	16 20:05 (51) 20:55 54 20:17 (51)
14	07:45			07:16	07:32	06:39	05:58	19:47 (51) 05:40 06:03 (36)
	17:08			17:48	19:22	19:57	20:30	19 20:06 (51) 20:55 54 20:17 (51)
15	07:45			07:15	07:31	06:38	05:57	19:46 (51) 05:40 06:03 (36)
	17:09			17:49	19:23	19:58	20:31	21 20:07 (51) 20:56 54 20:17 (51)
16	07:44			07:14	07:29	06:36	05:56	19:45 (51) 05:40 06:03 (36)
	17:10			17:50	19:24	20:00	20:32	23 20:08 (51) 20:56 54 20:17 (51)
17	07:44			07:12	07:27	06:34	05:55	19:44 (51) 05:40 06:03 (36)
	17:12			17:51	19:25	20:00	20:33	25 20:09 (51) 20:56 54 20:17 (51)
18	07:43			07:11	07:26	06:33	05:54	19:44 (51) 05:40 06:03 (36)
	17:13			17:53	19:27	20:01	20:34	26 20:10 (51) 20:57 54 20:17 (51)
19	07:43			07:09	07:24	06:31	05:53	19:43 (51) 05:40 06:03 (36)
	17:14			17:54	19:28	20:02	20:35	28 20:11 (51) 20:57 54 20:17 (51)
20	07:42			07:08	07:22	06:30	05:52	19:42 (51) 05:40 06:03 (36)
	17:15			17:55	19:29	20:03	20:36	29 20:11 (51) 20:57 54 20:17 (51)
21	07:41			07:07	07:20	06:28	05:51	19:42 (51) 05:40 06:03 (36)
	17:16			17:57	19:30	20:04	20:37	30 20:12 (51) 20:58 54 20:17 (51)
22	07:41			07:05	07:19	06:27	05:50	19:42 (51) 05:40 06:04 (36)
	17:18			17:58	19:31	20:05	20:38	32 20:14 (51) 20:58 54 20:18 (51)
23	07:40			07:04	07:17	06:25	05:49	19:42 (51) 05:41 06:04 (36)
	17:19			17:59	19:32	20:06	20:39	32 20:14 (51) 20:58 54 20:18 (51)
24	07:39			07:02	07:15	06:24	05:48	19:42 (51) 05:41 06:04 (36)
	17:20			18:00	19:34	20:07	20:40	32 20:14 (51) 20:58 54 20:18 (51)
25	07:38			07:00	07:13	06:22	05:48	19:41 (51) 05:41 06:04 (36)
	17:22			18:02	19:35	20:09	20:41	33 20:14 (51) 20:58 54 20:18 (51)
26	07:38			06:59	07:12	06:21	05:47	19:42 (51) 05:42 06:05 (36)
	17:23			18:03	19:36	20:10	20:41	33 20:15 (51) 20:59 54 20:19 (51)
27	07:37			06:57	07:10	06:19	05:46	19:42 (51) 05:42 06:05 (36)
	17:24			18:04	19:37	20:11	20:42	33 20:15 (51) 20:59 54 20:19 (51)
28	07:36			06:56	07:08	06:18	05:46	06:08 (36) 05:42 06:06 (36)
	17:25			18:05	19:38	20:12	20:43	37 20:16 (51) 20:59 54 20:20 (51)
29	07:35				07:06	06:16	05:45	06:07 (36) 05:43 06:06 (36)
	17:27				19:39	20:13	20:44	39 20:15 (51) 20:59 53 20:20 (51)
30	07:34				07:05	06:15	05:44	06:06 (36) 05:43 06:06 (36)
	17:28				19:40	20:14	20:45	42 20:15 (51) 20:59 54 20:20 (51)
31	07:33				07:03		05:44	06:06 (36)
	17:29				19:41		20:46	44 20:16 (51)
Potential sun hours	294		295	370	401	452		457
Total, worst case		163				598		1573
Sun reduction		0.31				0.56		0.65
Oper. time red.		1.00				1.00		1.00
Wind dir. red.		0.71				0.59		0.63
Total reduction		0.22				0.34		0.41
Total, real		36				200		651

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

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US-SYRACUSE, NY 13202

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Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 124 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1320)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

July		August		September		October		November		December	
1	05:44	06:07 (36)	06:09	13	20:01 (51)	06:42	07:14	06:50	07:26	15:45 (112)	
2	05:44	06:07 (36)	06:10	13	20:14 (51)	06:43	07:15	06:51	07:28	15:43 (112)	
3	05:45	06:08 (36)	06:11	7	20:11 (51)	06:44	07:16	06:53	07:29	15:41 (112)	
4	05:45	06:09 (36)	06:12			06:45	07:17	06:54	07:30	15:41 (112)	
5	05:46	06:10 (36)	06:13			06:46	07:18	06:55	07:31	15:40 (112)	
6	05:47	06:11 (36)	06:14			06:47	07:19	06:56	07:32	15:40 (112)	
7	05:47	06:12 (36)	06:15			06:48	07:20	06:58	07:33	15:40 (112)	
8	05:48	06:13 (36)	06:16			06:49	07:21	06:59	07:34	15:40 (112)	
9	05:49	06:14 (36)	06:17			06:50	07:22	07:00	07:34	15:40 (112)	
10	05:49	06:15 (36)	06:18			06:51	07:23	07:01	07:35	15:40 (112)	
11	05:50	06:16 (36)	06:19			06:52	07:24	07:02	07:36	15:39 (112)	
12	05:51	06:17 (36)	06:20			06:53	07:25	07:03	07:37	15:39 (112)	
13	05:52	06:18 (36)	06:21			06:54	07:26	07:04	07:38	15:38 (112)	
14	05:52	06:19 (36)	06:22			06:55	07:27	07:05	07:39	15:37 (112)	
15	05:53	06:20 (36)	06:23			06:56	07:28	07:06	07:40	15:36 (112)	
16	05:54	06:21 (36)	06:24			06:57	07:29	07:07	07:41	15:35 (112)	
17	05:55	06:22 (36)	06:25			06:58	07:30	07:08	07:42	15:34 (112)	
18	05:56	06:23 (36)	06:26			06:59	07:31	07:09	07:43	15:33 (112)	
19	05:57	06:24 (36)	06:27			07:00	07:32	07:10	07:44	15:32 (112)	
20	05:58	06:25 (36)	06:28			07:01	07:33	07:11	07:45	15:31 (112)	
21	05:58	06:26 (36)	06:29			07:02	07:34	07:12	07:46	15:30 (112)	
22	05:59	06:27 (36)	06:30			07:03	07:35	07:13	07:47	15:29 (112)	
23	06:00	06:28 (36)	06:31			07:04	07:36	07:14	07:48	15:28 (112)	
24	06:01	06:29 (36)	06:32			07:05	07:37	07:15	07:49	15:27 (112)	
25	06:02	06:30 (36)	06:33			07:06	07:38	07:16	07:50	15:26 (112)	
26	06:03	06:31 (36)	06:34			07:07	07:39	07:17	07:51	15:25 (112)	
27	06:04	06:32 (36)	06:35			07:08	07:40	07:18	07:52	15:24 (112)	
28	06:05	06:33 (36)	06:36			07:09	07:41	07:19	07:53	15:23 (112)	
29	06:06	06:34 (36)	06:37			07:10	07:42	07:20	07:54	15:22 (112)	
30	06:07	06:35 (36)	06:38			07:11	07:43	07:21	07:55	15:21 (112)	
31	06:08	06:36 (36)	06:39			07:12	07:44	07:22	07:56	15:20 (112)	
Potential sun hours	464	431				375	343	294	283	611	
Total, worst case	1160	20								0.27	
Sun reduction	0.67	0.64								1.00	
Oper. time red.	1.00	1.00								0.71	
Wind dir. red.	0.61	0.59								0.19	
Total reduction	0.41	0.38								118	
Total, real	478	8									

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 125 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1321)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:47 16:55	07:32 17:31	06:54 18:06	07:01 19:43	06:14 20:15	19:29 (51) 20:47	05:43 20:47	06:06 (36) 20:59	06:08 (36) 20:39	06:31 (36) 20:42	07:14 19:00	06:50 17:12
2	07:47 16:56	07:31 17:32	06:53 18:08	07:00 19:44	06:12 20:16	19:28 (51) 20:47	05:43 20:47	06:05 (36) 20:58	06:08 (36) 20:38	06:32 (36) 20:43	07:15 18:58	06:51 17:10
3	07:47 16:57	07:30 17:33	06:51 18:09	06:58 19:45	06:11 20:18	19:27 (51) 20:48	05:42 20:48	06:05 (36) 20:58	06:08 (36) 20:37	06:33 (36) 20:44	07:16 18:57	06:53 17:09
4	07:47 16:58	07:29 17:35	06:49 18:10	06:56 19:46	06:10 20:19	19:27 (51) 20:49	05:42 20:49	06:04 (36) 20:58	06:09 (36) 20:36	06:34 (36) 20:45	07:17 18:55	06:54 17:08
5	07:47 16:59	07:28 17:36	06:48 18:11	06:54 19:47	06:08 20:20	19:26 (51) 20:50	05:42 20:50	06:04 (36) 20:58	06:09 (36) 20:34	06:35 (36) 20:46	07:18 18:53	06:55 17:07
6	07:47 17:00	07:27 17:37	06:46 18:13	06:53 19:48	06:07 20:21	19:25 (51) 20:50	05:41 20:50	06:04 (36) 20:58	06:10 (36) 20:33	06:36 (36) 20:47	07:19 18:52	06:56 17:05
7	07:47 17:01	07:25 17:38	06:44 18:14	06:51 19:49	06:06 20:22	06:26 (36) 20:51	05:41 20:51	06:03 (36) 20:57	06:10 (36) 20:32	06:37 (36) 20:43	07:20 18:50	06:58 17:04
8	07:47 17:02	07:24 17:40	06:43 18:15	06:49 19:51	06:05 20:23	06:25 (36) 20:52	05:41 20:52	06:03 (36) 20:57	06:11 (36) 20:31	06:38 (36) 20:41	07:22 18:48	06:59 17:03
9	07:47 17:03	07:23 17:41	06:41 18:16	06:48 19:52	06:03 20:24	06:24 (36) 20:52	05:40 20:52	06:03 (36) 20:57	06:12 (36) 20:29	06:39 (36) 20:39	07:23 18:47	07:00 17:02
10	07:46 17:04	07:22 17:42	06:39 18:17	06:46 19:53	06:02 20:25	06:23 (36) 20:53	05:40 20:53	06:03 (36) 20:56	06:12 (36) 20:28	06:38 (36) 20:37	07:24 18:45	07:01 17:01
11	07:46 17:05	07:20 17:44	06:38 18:18	06:44 19:54	06:01 20:26	06:22 (36) 20:54	05:40 20:54	06:04 (36) 20:56	06:13 (36) 20:27	06:37 (36) 20:36	07:25 18:43	07:03 17:00
12	07:46 17:06	07:19 17:45	06:36 18:20	06:43 19:55	06:00 20:27	06:21 (36) 20:54	05:40 20:54	06:04 (36) 20:55	06:14 (36) 20:25	06:38 (36) 20:34	07:26 18:42	07:04 16:59
13	07:45 17:07	07:18 17:46	06:34 18:21	06:41 19:56	05:59 20:28	06:20 (36) 20:55	05:40 20:55	06:04 (36) 20:55	06:15 (36) 20:24	06:39 (36) 20:32	07:27 18:40	07:05 16:58
14	07:45 17:08	07:16 17:48	06:32 18:22	06:39 19:57	05:58 20:30	06:19 (36) 20:55	05:40 20:55	06:05 (36) 20:54	06:16 (36) 20:23	06:40 (36) 20:30	07:28 18:38	07:06 16:57
15	07:45 17:09	07:15 17:49	06:31 18:23	06:38 19:58	05:57 20:31	06:18 (36) 20:56	05:40 20:56	06:05 (36) 20:54	06:17 (36) 20:21	06:41 (36) 20:28	07:30 18:37	07:08 16:56
16	07:44 17:10	07:14 17:50	06:29 18:24	06:36 20:00	05:56 20:32	06:17 (36) 20:56	05:40 20:56	06:05 (36) 20:53	06:18 (36) 20:20	06:42 (36) 20:26	07:31 18:35	07:09 16:55
17	07:44 17:12	07:12 17:51	06:27 18:25	06:34 20:00	05:55 20:33	06:16 (36) 20:56	05:40 20:56	06:05 (36) 20:52	06:19 (36) 20:18	06:43 (36) 20:27	07:32 18:33	07:10 16:54
18	07:43 17:13	07:11 17:53	06:26 18:27	06:33 20:01	05:54 20:34	06:15 (36) 20:57	05:40 20:57	06:05 (36) 20:52	06:19 (36) 20:17	06:44 (36) 20:28	07:33 18:32	07:11 16:53
19	07:43 17:14	07:09 17:54	06:24 18:28	06:31 20:02	05:53 20:35	06:14 (36) 20:57	05:40 20:57	06:05 (36) 20:51	06:19 (36) 20:15	06:45 (36) 20:25	07:34 18:30	07:12 16:53
20	07:42 17:15	07:08 17:55	06:22 18:29	06:30 20:03	05:52 20:36	06:13 (36) 20:57	05:40 20:57	06:06 (36) 20:50	06:20 (36) 20:14	06:46 (36) 20:29	07:35 18:29	07:14 16:52
21	07:41 17:16	07:07 17:57	06:20 18:30	06:28 20:04	05:51 20:37	06:12 (36) 20:58	05:40 20:58	06:06 (36) 20:50	06:21 (36) 20:12	06:47 (36) 20:28	07:37 18:27	07:15 16:51
22	07:41 17:18	07:05 17:58	06:19 18:31	06:27 20:05	05:50 20:38	06:12 (36) 20:58	05:40 20:58	06:07 (36) 20:49	06:22 (36) 20:11	06:48 (36) 20:31	07:38 18:26	07:16 16:50
23	07:40 17:19	07:04 17:59	06:17 18:32	06:25 20:06	05:49 20:39	06:11 (36) 20:58	05:40 20:58	06:07 (36) 20:48	06:23 (36) 20:09	06:49 (36) 20:32	07:39 18:24	07:17 16:50
24	07:39 17:20	07:02 18:00	06:15 18:34	06:24 20:07	05:48 20:40	06:10 (36) 20:58	05:40 20:58	06:06 (36) 20:47	06:24 (36) 20:08	06:50 (36) 20:33	07:40 18:23	07:19 16:49
25	07:38 17:22	07:00 18:02	06:13 18:35	06:22 20:09	05:48 20:41	06:09 (36) 20:58	05:40 20:58	06:06 (36) 20:46	06:25 (36) 20:06	06:51 (36) 20:34	07:41 18:21	07:20 16:49
26	07:38 17:23	06:59 18:03	06:12 18:36	06:21 20:10	05:47 20:41	06:09 (36) 20:59	05:40 20:59	06:07 (36) 20:45	06:26 (36) 20:04	06:52 (36) 20:35	07:42 18:20	07:21 16:48
27	07:37 17:24	06:57 18:04	06:10 18:37	06:19 20:11	05:46 20:42	06:08 (36) 20:59	05:40 20:59	06:07 (36) 20:44	06:27 (36) 20:03	06:53 (36) 20:36	07:43 18:18	07:22 16:48
28	07:36 17:25	06:56 18:05	06:08 18:38	06:18 20:12	05:46 20:43	06:08 (36) 20:59	05:40 20:59	06:08 (36) 20:43	06:28 (36) 20:01	06:54 (36) 20:37	07:44 18:17	07:23 16:47
29	07:35 17:27	06:55 18:06	06:06 18:39	06:16 20:13	05:45 20:44	06:07 (36) 20:59	05:40 20:59	06:08 (36) 20:42	06:29 (36) 20:09	06:55 (36) 20:38	07:45 18:16	07:24 16:47
30	07:34 17:28	06:54 18:07	06:05 18:40	06:15 20:14	05:44 20:45	06:06 (36) 20:59	05:40 20:59	06:07 (36) 20:41	06:30 (36) 20:08	06:56 (36) 20:39	07:46 18:14	07:25 16:46
31	07:33 17:29	06:53 18:08	06:03 18:41	06:14 20:15	05:44 20:46	06:06 (36) 20:59	05:40 20:59	06:08 (36) 20:40	06:31 (36) 20:07	06:57 (36) 20:38	07:47 18:13	07:26 16:54
Potential sun hours	294	295	370	401	452	457	464	431	375	343	294	283
Total, worst case				67	1526	1481	1653	513				
Sun reduction				0.51	0.56	0.65	0.67	0.64				
Oper. time red.				1.00	1.00	1.00	1.00	1.00				
Wind dir. red.				0.59	0.63	0.68	0.66	0.60				
Total reduction				0.30	0.35	0.44	0.44	0.38				
Total, real				20	541	654	728	197				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)

Project:

2015-08-31_Arkwright Summit_SFA

Printed/Page

8/31/2015 1:05 PM / 60

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 128 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1324)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:47 16:55	07:32 17:31	06:54 18:06	07:01 19:43	06:14 20:15	19:21 (51) 20:47	06:06 (36) 20:59	06:07 (36) 20:39	19:39 (51) 19:53	07:14 19:00	06:50 17:12	07:26 16:46
2	07:47 16:56	07:31 17:32	06:53 18:08	07:00 19:44	06:12 20:16	19:21 (51) 20:47	06:05 (36) 20:58	06:07 (36) 20:38	19:37 (51) 19:51	07:15 18:58	06:51 17:10	07:28 16:46
3	07:47 16:57	07:30 17:33	06:51 18:09	06:58 19:45	06:11 20:18	19:21 (51) 20:48	06:05 (36) 20:58	06:08 (36) 20:37	19:36 (51) 19:49	07:16 18:57	06:53 17:09	07:29 16:45
4	07:47 16:58	07:29 17:35	06:49 18:10	06:56 19:46	06:10 20:19	19:22 (51) 20:49	06:04 (36) 20:58	06:09 (36) 20:36	19:34 (51) 19:48	07:17 18:55	06:54 17:08	07:30 16:45
5	07:47 16:59	07:28 17:36	06:48 18:11	06:54 19:47	06:08 20:20	19:22 (51) 20:50	06:04 (36) 20:58	06:09 (36) 20:34	19:33 (51) 19:46	07:18 18:53	06:55 17:07	07:31 16:45
6	07:47 17:00	07:27 17:37	06:46 18:13	06:53 19:48	06:07 20:21	19:22 (51) 20:50	06:04 (36) 20:58	06:10 (36) 20:33	19:32 (51) 19:44	07:19 18:52	06:56 17:05	07:32 16:45
7	07:47 17:00	07:25 17:38	06:44 18:14	06:51 19:49	06:06 20:22	19:23 (51) 20:51	06:03 (36) 20:57	06:10 (36) 20:32	19:32 (51) 19:43	07:20 18:50	06:58 17:04	07:33 16:45
8	07:47 17:02	07:24 17:40	07:43 19:15	06:49 19:51	06:05 20:23	19:24 (51) 20:52	06:03 (36) 20:57	06:11 (36) 20:31	19:31 (51) 19:41	07:22 18:48	06:59 17:03	07:34 16:45
9	07:47 17:03	07:23 17:41	07:41 19:16	06:48 19:52	06:03 20:24	19:25 (51) 20:52	06:03 (36) 20:57	06:12 (36) 20:28	19:30 (51) 19:39	07:23 18:46	07:00 17:02	07:34 16:45
10	07:46 17:04	07:22 17:42	07:39 19:17	06:46 19:53	06:02 20:25	19:27 (51) 20:53	06:03 (36) 20:56	06:12 (36) 20:28	19:30 (51) 19:37	07:24 18:45	07:01 17:01	07:35 16:45
11	07:46 17:05	07:20 17:44	07:38 19:18	06:44 19:54	06:01 20:26	19:28 (51) 20:54	06:03 (36) 20:56	06:13 (36) 20:29	19:31 (51) 19:36	07:25 18:43	07:03 17:00	07:36 16:45
12	07:46 17:06	07:19 17:45	07:36 19:20	06:43 19:55	06:00 20:27	19:31 (51) 20:54	06:03 (36) 20:55	06:14 (36) 20:25	19:32 (51) 19:34	07:26 18:42	07:04 16:59	07:37 16:45
13	07:45 17:07	07:18 17:46	07:34 19:21	06:41 19:56	05:59 20:28	19:32 (51) 20:55	06:03 (36) 20:55	06:15 (36) 20:24	19:33 (51) 19:32	07:27 18:40	07:05 16:58	07:38 16:45
14	07:45 17:08	07:16 17:48	07:32 19:22	06:39 19:57	05:58 20:30	19:33 (51) 20:55	06:03 (36) 20:54	06:15 (36) 20:23	19:34 (51) 19:30	07:28 18:38	07:06 16:57	07:39 16:45
15	07:45 17:09	07:15 17:49	07:31 19:23	06:38 19:58	05:57 20:31	19:34 (51) 20:56	06:03 (36) 20:54	06:16 (36) 20:21	19:35 (51) 19:28	07:29 18:37	07:08 16:56	07:40 16:45
16	07:44 17:10	07:14 17:50	07:29 19:24	06:36 20:00	05:56 20:32	19:35 (51) 20:56	06:03 (36) 20:53	06:17 (36) 20:25	19:36 (51) 19:27	07:30 18:35	07:09 16:55	07:41 16:45
17	07:44 17:12	07:12 17:51	07:27 19:25	06:34 20:00	05:55 20:33	19:36 (51) 20:56	06:03 (36) 20:52	06:18 (36) 20:26	19:37 (51) 19:25	07:32 18:33	07:10 16:54	07:42 16:46
18	07:43 17:13	07:11 17:53	07:26 19:27	06:33 20:01	05:54 20:34	19:37 (51) 20:57	06:03 (36) 20:52	06:19 (36) 20:17	19:38 (51) 19:23	07:33 18:32	07:11 16:53	07:43 16:46
19	07:43 17:14	07:09 17:54	07:24 19:28	06:31 20:02	05:53 20:35	19:38 (51) 20:57	06:03 (36) 20:51	06:19 (36) 20:15	19:39 (51) 19:21	07:34 18:30	07:12 16:53	07:42 16:46
20	07:42 17:15	07:08 17:55	07:22 19:29	06:30 20:03	05:52 20:36	19:39 (51) 20:57	06:03 (36) 20:50	06:20 (36) 20:14	19:40 (51) 19:20	07:35 18:29	07:14 16:52	07:43 16:47
21	07:41 17:16	07:07 17:57	07:20 19:30	06:28 20:04	05:51 20:37	19:40 (51) 20:58	06:03 (36) 20:50	06:21 (36) 20:12	19:41 (51) 19:18	07:37 18:27	07:15 16:51	07:43 16:47
22	07:41 17:18	07:05 17:58	07:19 19:31	06:27 20:05	05:50 20:38	19:41 (51) 20:58	06:04 (36) 20:49	06:22 (36) 20:11	19:42 (51) 19:16	07:38 18:26	07:16 16:50	07:44 16:48
23	07:40 17:19	07:04 17:59	07:17 19:32	06:25 20:06	05:49 20:39	19:42 (51) 20:58	06:04 (36) 20:48	06:23 (36) 20:09	19:43 (51) 19:14	07:39 18:24	07:17 16:50	07:44 16:48
24	07:39 17:20	07:02 18:00	07:15 19:34	06:24 20:07	05:48 20:40	19:43 (51) 20:58	06:04 (36) 20:47	06:24 (36) 20:08	19:44 (51) 19:06	07:40 18:23	07:19 16:49	07:45 16:45
25	07:38 17:22	07:00 18:02	07:13 19:35	06:22 20:09	05:47 20:41	19:44 (51) 20:58	06:04 (36) 20:46	06:25 (36) 20:06	19:45 (51) 19:11	07:41 18:21	07:20 16:49	07:45 16:50
26	07:38 17:23	06:59 18:03	07:12 19:36	06:21 20:10	05:47 20:41	19:45 (51) 20:58	06:05 (36) 20:45	06:26 (36) 20:04	19:46 (51) 19:09	07:42 18:20	07:21 16:48	07:45 16:50
27	07:37 17:24	06:57 18:04	07:10 19:37	06:19 20:11	05:46 20:42	19:46 (51) 20:58	06:06 (36) 20:44	06:27 (36) 20:03	19:47 (51) 19:07	07:43 18:18	07:22 16:48	07:46 16:51
28	07:36 17:25	06:56 18:05	07:08 19:38	06:18 20:12	05:45 20:43	19:47 (51) 20:58	06:06 (36) 20:43	06:28 (36) 20:01	19:48 (51) 19:05	07:44 18:17	07:23 16:47	07:46 16:52
29	07:35 17:27		07:06 19:39	06:16 20:13	05:45 20:44	19:48 (51) 20:58	06:06 (36) 20:42	06:29 (36) 19:58	19:49 (51) 19:04	07:45 18:16	07:24 16:47	07:46 16:52
30	07:34 17:28		07:05 19:40	06:15 20:14	05:44 20:45	19:49 (51) 20:58	06:06 (36) 20:41	06:30 (36) 19:56	19:50 (51) 19:02	07:46 18:14	07:25 16:46	07:47 16:53
31	07:33 17:29		07:03 19:41	06:14 20:15	05:44 20:46	19:50 (51) 20:58	06:06 (36) 20:40	06:31 (36) 19:54	19:51 (51) 19:03	07:47 18:13	07:26 16:46	07:47 16:54
Potential sun hours	294	295	370	401	452	457	464	431	375	343	294	283
Total, worst case				236	667	1407		900	509			
Sun reduction				0.51	0.56	0.65		0.67	0.64			
Oper. time red.				1.00	1.00	1.00		1.00	1.00			
Wind dir. red.				0.58	0.64	0.69		0.69	0.58			
Total reduction				0.30	0.36	0.44		0.46	0.37			
Total, real				70	240	626		413	189			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 61

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 134 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1330)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December			
1	07:47 16:55	07:32 17:31	06:54 18:06	07:01 19:43	06:14 20:15	05:43 20:47	19:52 (51) 20:18 (51)	05:44 20:59	20:00 (51) 20:21 (51)	06:09 20:39	20:11 (51) 20:14 (51)	06:42 19:53	07:14 19:00	06:50 17:12	07:26 16:46
2	07:47 16:56	07:31 17:32	06:53 18:08	07:00 19:44	06:12 20:16	05:43 20:47	19:52 (51) 20:17 (51)	05:44 20:58	20:00 (51) 20:21 (51)	06:10 20:38	20:11 (51) 20:14 (51)	06:43 19:51	07:15 18:58	06:51 17:10	07:28 16:46
3	07:47 16:57	07:30 17:33	06:51 18:09	06:58 19:45	06:11 20:18	05:42 20:48	19:52 (51) 20:17 (51)	05:45 20:58	20:00 (51) 20:22 (51)	06:11 20:37	20:11 (51) 20:14 (51)	06:44 19:49	07:16 18:57	06:53 17:09	07:29 16:45
4	07:47 16:58	07:29 17:35	06:49 18:10	06:49 19:46	06:10 20:19	05:42 20:49	19:52 (51) 20:17 (51)	05:45 20:58	20:00 (51) 20:23 (51)	06:12 20:36	20:11 (51) 20:14 (51)	06:45 19:48	07:17 18:55	06:54 17:08	07:30 16:45
5	07:47 16:59	07:28 17:36	06:48 18:11	06:48 19:47	06:08 20:20	05:42 20:50	19:53 (51) 20:17 (51)	05:46 20:58	20:00 (51) 20:22 (51)	06:13 20:34	20:11 (51) 20:14 (51)	06:46 19:46	07:18 18:53	06:55 17:07	07:31 16:45
6	07:47 17:00	07:27 17:37	06:46 18:13	06:53 19:48	06:07 20:21	05:41 20:50	19:54 (51) 20:17 (51)	05:47 20:58	20:00 (51) 20:23 (51)	06:14 20:33	20:11 (51) 20:14 (51)	06:47 19:44	07:19 18:52	06:56 17:05	07:32 16:45
7	07:47 17:01	07:25 17:38	06:44 18:14	06:51 19:49	06:06 20:22	05:41 20:51	19:53 (51) 20:16 (51)	05:47 20:57	19:59 (51) 20:23 (51)	06:15 20:32	20:11 (51) 20:14 (51)	06:48 19:43	07:20 18:50	06:58 17:04	07:33 16:45
8	07:47 17:02	07:24 17:40	07:43 19:15	06:49 19:51	06:05 20:23	05:41 20:52	19:54 (51) 20:16 (51)	05:48 20:57	20:00 (51) 20:24 (51)	06:16 20:31	20:11 (51) 20:14 (51)	06:49 19:41	07:21 18:48	06:59 17:03	07:34 16:45
9	07:47 17:03	07:23 17:41	07:41 19:16	06:48 19:52	06:03 20:24	05:40 20:52	19:55 (51) 20:17 (51)	05:49 20:57	20:00 (51) 20:24 (51)	06:17 20:29	20:11 (51) 20:14 (51)	06:50 19:39	07:23 18:46	07:00 17:02	07:34 16:45
10	07:46 17:04	07:22 17:42	07:39 19:17	06:46 19:53	06:02 20:25	05:40 20:53	19:55 (51) 20:17 (51)	05:49 20:56	19:59 (51) 20:24 (51)	06:18 20:28	20:11 (51) 20:14 (51)	06:51 19:37	07:24 18:45	07:01 17:01	07:35 16:45
11	07:46 17:05	07:20 17:44	07:38 19:18	06:44 19:54	06:01 20:26	05:40 20:54	19:56 (51) 20:17 (51)	05:50 20:56	19:59 (51) 20:25 (51)	06:19 20:27	20:11 (51) 20:14 (51)	06:52 19:36	07:25 18:43	07:03 17:00	07:36 16:45
12	07:46 17:06	07:19 17:45	07:36 19:20	06:43 19:55	06:00 20:27	19:59 (51) 20:04 (51)	05:51 20:54	05:51 20:55	19:59 (51) 20:25 (51)	06:20 20:25	20:11 (51) 20:14 (51)	06:53 19:34	07:26 18:41	07:04 16:59	07:37 16:45
13	07:45 17:07	07:18 17:46	07:34 19:21	06:41 19:56	05:59 20:28	19:57 (51) 20:05 (51)	05:40 20:55	05:52 20:55	20:00 (51) 20:26 (51)	06:22 20:24	20:11 (51) 20:14 (51)	06:54 19:32	07:27 18:40	07:05 16:58	07:38 16:45
14	07:45 17:08	07:16 17:48	07:32 19:22	06:39 19:57	05:58 20:30	19:55 (51) 20:06 (51)	05:40 20:55	05:52 20:54	19:59 (51) 20:25 (51)	06:23 20:23	20:11 (51) 20:14 (51)	06:55 19:30	07:28 18:38	07:06 16:57	07:39 16:45
15	07:45 17:09	07:15 17:49	07:31 19:23	06:38 19:58	05:57 20:31	19:54 (51) 20:07 (51)	05:40 20:56	05:53 20:54	19:59 (51) 20:26 (51)	06:24 20:21	20:11 (51) 20:14 (51)	06:57 19:28	07:30 18:37	07:08 16:56	07:39 16:45
16	07:44 17:10	07:14 17:50	07:29 19:24	06:36 20:00	05:56 20:32	19:53 (51) 20:08 (51)	05:40 20:56	05:54 20:53	19:59 (51) 20:26 (51)	06:25 20:20	20:11 (51) 20:14 (51)	06:58 19:27	07:31 18:35	07:09 16:55	07:40 16:45
17	07:44 17:12	07:12 17:51	07:27 19:25	06:34 20:00	05:55 20:33	19:52 (51) 20:09 (51)	05:40 20:56	05:55 20:52	20:00 (51) 20:27 (51)	06:26 20:18	20:11 (51) 20:14 (51)	06:59 19:25	07:32 18:33	07:10 16:54	07:41 16:46
18	07:43 17:13	07:11 17:53	07:26 19:27	06:33 20:01	05:54 20:34	19:52 (51) 20:10 (51)	05:40 20:57	05:56 20:52	20:00 (51) 20:26 (51)	06:27 20:17	20:11 (51) 20:14 (51)	07:00 19:23	07:33 18:32	07:11 16:53	07:41 16:46
19	07:43 17:14	07:09 17:54	07:24 19:28	06:31 20:02	05:53 20:35	19:51 (51) 20:11 (51)	05:40 20:57	05:57 20:51	19:59 (51) 20:25 (51)	06:28 20:15	20:11 (51) 20:14 (51)	07:01 19:21	07:34 18:30	07:12 16:53	07:42 16:46
20	07:42 17:15	07:08 17:55	07:22 19:29	06:30 20:03	05:52 20:36	19:50 (51) 20:11 (51)	05:40 20:57	05:57 20:50	20:00 (51) 20:24 (51)	06:29 20:14	20:11 (51) 20:14 (51)	07:02 19:20	07:35 18:29	07:14 16:52	07:43 16:47
21	07:41 17:16	07:07 17:57	07:20 19:30	06:28 20:04	05:51 20:37	19:50 (51) 20:12 (51)	05:40 20:58	05:58 20:50	20:00 (51) 20:24 (51)	06:30 20:12	20:11 (51) 20:14 (51)	07:03 19:18	07:37 18:27	07:15 16:51	07:43 16:47
22	07:41 17:18	07:05 17:58	07:19 19:31	06:27 20:05	05:50 20:38	19:51 (51) 20:14 (51)	05:40 20:58	05:59 20:49	20:00 (51) 20:23 (51)	06:31 20:11	20:11 (51) 20:14 (51)	07:04 19:16	07:38 18:26	07:16 16:50	07:44 16:48
23	07:40 17:19	07:04 17:59	07:17 19:32	06:25 20:06	05:49 20:39	19:50 (51) 20:15 (51)	05:41 20:58	06:00 20:48	20:01 (51) 20:22 (51)	06:32 20:09	20:11 (51) 20:14 (51)	07:05 19:14	07:39 18:24	07:17 16:50	07:44 16:48
24	07:39 17:20	07:02 18:00	07:15 19:34	06:24 20:07	05:48 20:40	19:50 (51) 20:15 (51)	05:41 20:58	06:01 20:47	20:01 (51) 20:22 (51)	06:33 20:08	20:11 (51) 20:14 (51)	07:06 19:13	07:40 18:23	07:18 16:49	07:45 16:49
25	07:38 17:22	07:00 18:02	07:13 19:35	06:22 20:09	05:48 20:41	19:50 (51) 20:16 (51)	05:41 20:58	06:02 20:46	20:02 (51) 20:21 (51)	06:34 20:06	20:11 (51) 20:14 (51)	07:07 19:11	07:41 18:21	07:20 16:49	07:45 16:50
26	07:38 17:23	06:59 18:03	07:12 19:36	06:21 20:10	05:47 20:41	19:50 (51) 20:17 (51)	05:42 20:59	06:03 20:45	20:02 (51) 20:20 (51)	06:35 20:04	20:11 (51) 20:14 (51)	07:08 19:09	07:43 18:20	07:21 16:48	07:45 16:50
27	07:37 17:24	06:57 18:04	07:10 19:37	06:19 20:11	05:46 20:42	19:50 (51) 20:17 (51)	05:42 20:59	06:04 20:44	20:03 (51) 20:19 (51)	06:36 20:04	20:11 (51) 20:14 (51)	07:09 19:07	07:44 18:18	07:22 16:48	07:46 16:51
28	07:36 17:25	06:56 18:05	07:08 19:38	06:18 20:12	05:46 20:43	19:51 (51) 20:18 (51)	05:42 20:59	06:05 20:43	20:04 (51) 20:20 (51)	06:37 20:03	20:11 (51) 20:14 (51)	07:10 19:05	07:45 18:17	07:23 16:47	07:46 16:52
29	07:35 17:27	07:06 18:07	07:06 19:39	06:16 20:13	05:45 20:44	19:51 (51) 20:17 (51)	05:43 20:59	06:06 20:42	20:05 (51) 20:17 (51)	06:39 19:58	20:11 (51) 20:14 (51)	07:12 19:04	07:46 18:16	07:24 16:47	07:46 16:52
30	07:34 17:28	07:05 18:40	07:05 19:40	06:15 20:14	05:44 20:45	19:50 (51) 20:17 (51)	05:43 20:59	06:07 20:41	20:05 (51) 20:16 (51)	06:40 19:56	20:11 (51) 20:14 (51)	07:13 19:02	07:48 18:14	07:25 16:46	07:47 16:53
31	07:33 17:29	07:03 18:41	07:03 19:41	06:13 20:46	05:44 20:46	19:51 (51) 20:17 (51)	05:44 20:59	06:08 20:40	20:07 (51) 20:15 (51)	06:41 19:54	20:11 (51) 20:14 (51)	07:14 18:13	07:49 18:43	07:27 16:54	07:47 16:54
Potential sun hours	294	295	370	401	452	457	464	431	375	343	294	283			
Total, worst case					409	619	677	3							
Sun reduction					0.56	0.65	0.67	0.64							
Oper. time red.					1.00	1.00	1.00	1.00							
Wind dir. red.					0.59	0.59	0.59	0.59							
Total reduction					0.33	0.38	0.39	0.37							
Total, real					134	235	265	1							

Project:

2015-08-31_Arkwright Summit_SFA

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Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 135 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1331)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117		541	386	285 8,759

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December			
1	07:47 16:55	07:32 17:31	06:54 18:06	07:01 19:43	06:14 20:15	05:43 20:47	06:06 (36) 20:19 (111)	05:44 20:59	06:07 (36) 20:22 (51)	06:09 20:39	06:31 (36) 20:14 (111)	06:42 19:53	07:14 19:00	06:50 17:12	07:26 16:46
2	07:47 16:56	07:31 17:32	06:53 18:08	07:00 19:44	06:12 20:16	05:43 20:47	06:05 (36) 20:18 (111)	05:44 20:58	06:07 (36) 20:22 (51)	06:10 20:38	06:32 (36) 20:12 (111)	06:43 19:51	07:15 18:58	06:51 17:10	07:28 16:46
3	07:47 16:57	07:30 17:33	06:51 18:09	06:58 19:45	06:11 20:18	05:42 20:48	06:05 (36) 20:19 (111)	05:45 20:58	06:08 (36) 20:22 (51)	06:11 20:37	06:33 (36) 20:13 (111)	06:44 19:49	07:16 18:57	06:53 17:09	07:29 16:45
4	07:47 16:58	07:29 17:35	06:49 18:10	06:49 19:46	06:10 20:19	05:42 20:49	06:04 (36) 20:18 (111)	05:45 20:58	06:09 (36) 20:23 (51)	06:12 20:36	06:35 (36) 20:14 (111)	06:45 19:48	07:17 18:55	06:54 17:08	07:30 16:45
5	07:47 16:59	07:28 17:36	06:48 18:11	06:48 19:47	06:08 20:20	05:42 20:50	06:04 (36) 20:18 (111)	05:46 20:58	06:09 (36) 20:23 (51)	06:13 20:34	06:36 (36) 20:15 (111)	06:46 19:46	07:18 18:53	06:55 17:07	07:31 16:45
6	07:47 17:00	07:27 17:37	06:46 18:13	06:53 19:48	06:07 20:21	05:41 20:50	06:04 (36) 20:18 (111)	05:47 20:58	06:10 (36) 20:24 (111)	06:14 20:33	06:37 (36) 20:16 (111)	06:47 19:44	07:19 18:52	06:56 17:05	07:32 16:45
7	07:47 17:01	07:25 17:38	06:44 18:14	06:51 19:49	06:06 20:22	05:41 20:51	06:03 (36) 20:17 (51)	05:47 20:57	06:10 (36) 20:24 (111)	06:15 20:32	06:38 (36) 20:17 (111)	06:48 19:43	07:20 18:50	06:58 17:04	07:33 16:45
8	07:47 17:02	07:24 17:40	06:43 19:15	06:49 19:51	06:05 20:23	05:41 20:52	06:03 (36) 20:17 (51)	05:48 20:57	06:11 (36) 20:25 (111)	06:16 20:31	06:39 (36) 20:18 (111)	06:49 19:41	07:22 18:48	06:59 17:03	07:34 16:45
9	07:47 17:03	07:23 17:41	06:41 19:16	06:48 19:52	06:03 20:24	05:40 20:52	06:03 (36) 20:17 (51)	05:49 20:57	06:12 (36) 20:26 (111)	06:17 20:29	06:41 (36) 20:19 (111)	06:50 19:39	07:23 18:47	07:00 17:02	07:34 16:45
10	07:46 17:04	07:22 17:42	06:39 19:17	06:46 19:53	06:02 20:25	05:40 20:53	06:03 (36) 20:18 (51)	05:49 20:56	06:12 (36) 20:25 (111)	06:18 20:28	06:40 (36) 20:19 (111)	06:51 19:37	07:24 18:45	07:01 17:01	07:35 16:45
11	07:46 17:05	07:20 17:44	06:38 19:18	06:44 19:54	06:01 20:26	05:40 20:54	06:03 (36) 20:18 (51)	05:50 20:56	06:13 (36) 20:26 (111)	06:19 20:27	06:42 (36) 20:20 (111)	06:52 19:36	07:25 18:43	07:03 17:00	07:36 16:45
12	07:46 17:06	07:19 17:45	06:36 19:20	06:43 19:55	06:00 20:27	05:40 20:54	06:03 (36) 20:18 (51)	05:51 20:55	06:14 (36) 20:27 (111)	06:20 20:25	06:43 (36) 20:22 (111)	06:53 19:34	07:26 18:42	07:04 16:59	07:37 16:45
13	07:45 17:07	07:18 17:46	06:34 19:21	06:41 19:56	05:59 20:28	05:39 20:55	06:04 (36) 20:18 (51)	05:40 20:52	06:15 (36) 20:28 (111)	06:22 20:24	06:44 (36) 20:21 (111)	06:54 19:32	07:27 18:40	07:05 16:58	07:38 16:45
14	07:45 17:08	07:16 17:48	06:32 19:22	06:39 19:57	05:58 20:30	05:38 20:55	06:04 (36) 20:18 (51)	05:55 20:54	06:15 (36) 20:28 (111)	06:23 20:23	06:45 (36) 20:20 (111)	06:55 19:30	07:28 18:38	07:06 16:57	07:39 16:45
15	07:45 17:09	07:15 17:49	06:31 19:23	06:38 19:58	05:57 20:31	05:37 20:56	06:04 (36) 20:19 (51)	05:40 20:54	06:16 (36) 20:28 (111)	06:24 20:21	06:46 (36) 20:25 (111)	06:57 19:28	07:30 18:37	07:08 16:56	07:39 16:45
16	07:44 17:10	07:14 17:50	06:29 19:24	06:36 20:00	05:56 20:32	05:36 20:56	06:04 (36) 20:19 (51)	05:40 20:53	06:17 (36) 20:27 (111)	06:25 20:20	06:47 (36) 20:19 (111)	06:58 19:27	07:31 18:35	07:09 16:55	07:40 16:45
17	07:44 17:12	07:12 17:51	06:27 19:25	06:34 20:00	05:55 20:33	05:35 20:56	06:05 (36) 20:19 (51)	05:53 20:53	06:18 (36) 20:27 (111)	06:26 20:18	06:48 (36) 20:21 (111)	06:59 19:25	07:32 18:33	07:10 16:54	07:41 16:46
18	07:43 17:13	07:11 17:53	06:26 19:27	06:33 20:01	05:54 20:34	05:34 20:57	06:05 (36) 20:19 (51)	05:56 20:52	06:19 (36) 20:26 (111)	06:27 20:17	06:58 (36) 20:24 (111)	07:00 19:23	07:33 18:32	07:11 16:53	07:41 16:46
19	07:43 17:14	07:09 17:54	06:24 19:28	06:31 20:02	05:53 20:35	05:33 20:57	06:05 (36) 20:19 (51)	05:57 20:51	06:19 (36) 20:25 (111)	06:28 20:15	06:59 (36) 20:22 (111)	07:01 19:21	07:34 18:30	07:12 16:53	07:42 16:46
20	07:42 17:15	07:08 17:55	06:22 19:29	06:30 20:03	05:52 20:36	05:32 20:57	06:05 (36) 20:19 (51)	05:57 20:50	06:20 (36) 20:24 (111)	06:29 20:14	06:59 (36) 20:21 (111)	07:02 19:20	07:35 18:29	07:14 16:52	07:43 16:47
21	07:41 17:16	07:07 17:57	06:20 19:30	06:28 20:04	05:51 20:37	05:31 20:58	06:05 (36) 20:19 (51)	05:58 20:50	06:21 (36) 20:24 (111)	06:30 20:12	06:59 (36) 20:21 (111)	07:03 19:18	07:37 18:27	07:15 16:51	07:43 16:47
22	07:41 17:18	07:05 17:58	06:19 19:31	06:27 20:05	05:50 20:38	05:30 20:58	06:06 (36) 20:20 (51)	05:59 20:49	06:22 (36) 20:23 (51)	06:31 20:11	06:59 (36) 20:23 (111)	07:04 19:16	07:38 18:26	07:16 16:50	07:44 16:48
23	07:40 17:19	07:04 17:59	06:17 19:32	06:25 20:06	05:49 20:39	05:29 20:58	06:06 (36) 20:20 (51)	06:00 20:48	06:23 (36) 20:22 (51)	06:32 20:09	06:59 (36) 20:26 (111)	07:05 19:14	07:39 18:24	07:17 16:50	07:44 16:48
24	07:39 17:20	07:02 18:00	06:15 19:34	06:24 20:07	05:48 20:40	05:28 20:58	06:06 (36) 20:20 (51)	06:01 20:47	06:24 (36) 20:22 (51)	06:33 20:08	06:59 (36) 20:25 (111)	07:06 19:13	07:40 18:23	07:19 16:49	07:45 16:49
25	07:38 17:22	07:00 18:02	06:13 19:35	06:22 20:09	05:48 20:41	05:27 20:58	06:06 (36) 20:20 (51)	06:02 20:46	06:25 (36) 20:21 (51)	06:34 20:06	06:59 (36) 20:26 (111)	07:07 19:11	07:41 18:21	07:20 16:49	07:45 16:50
26	07:38 17:23	06:59 18:03	06:12 19:36	06:21 20:10	05:47 20:41	05:26 20:59	06:07 (36) 20:21 (51)	06:03 20:45	06:26 (36) 20:20 (51)	06:35 20:04	06:59 (36) 20:27 (111)	07:08 19:09	07:43 18:20	07:21 16:48	07:45 16:50
27	07:37 17:24	06:57 18:04	06:10 19:37	06:19 20:11	05:46 20:42	05:25 20:59	06:08 (36) 20:21 (51)	06:04 20:44	06:27 (36) 20:21 (51)	06:36 20:03	06:59 (36) 20:28 (111)	07:09 19:07	07:44 18:18	07:22 16:48	07:46 16:51
28	07:36 17:25	06:56 18:05	06:08 19:38	06:18 20:12	05:46 20:43	05:24 20:59	06:08 (36) 20:19 (111)	06:05 20:58	06:28 (36) 20:22 (51)	06:37 20:43	06:59 (36) 20:18 (51)	07:10 19:05	07:45 18:17	07:23 16:47	07:46 16:52
29	07:35 17:27		06:06 19:39	06:16 20:13	05:45 20:44	05:23 20:59	06:07 (36) 20:19 (111)	06:06 20:57	06:29 (36) 20:21 (51)	06:39 19:58	06:59 (36) 20:30 (36)	07:12 19:04	07:46 18:16	07:24 16:47	07:46 16:52
30	07:34 17:28		06:05 19:40	06:15 20:14	05:44 20:45	05:22 20:59	06:06 (36) 20:19 (111)	06:07 20:57	06:30 (36) 20:21 (51)	06:40 20:41	06:59 (36) 20:17 (111)	07:13 19:02	07:48 18:14	07:25 16:46	07:47 16:53
31	07:33 17:29		06:03 19:41	06:13 20:15	05:42 20:46	05:21 20:59	06:06 (36) 20:19 (111)	06:08 20:40	06:30 (36) 20:15 (111)	06:41 19:54	06:59 (36) 20:25 (111)	07:14 19:02	07:49 18:13	07:26 16:45	07:47 16:54
Potential sun hours	294	295	370	401	452	457	464	431	375	343	294	283			
Total, worst case					1188	2319	2049								
Sun reduction					0.56	0.65	0.67								
Oper. time red.					1.00	1.00	1.00								
Wind dir. red.					0.63	0.64	0.63								
Total reduction					0.35	0.41	0.42								
Total, real					419	957	867								

Project:

2015-08-31_Arkwright Summit_SFA

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US-SYRACUSE, NY 13202

(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 136 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1332)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	January	February	March		April	May		June
1	07:47	07:32	06:54		07:01	06:14		05:43
	16:55	17:31	18:06		19:43	20:15		20:47
2	07:47	07:31	06:53		07:00	06:12	4	06:32 (36) 05:43
	16:56	17:32	18:08		19:44	20:16		20:47
3	07:47	07:30	06:51		06:58	06:11	8	06:31 (36) 05:42
	16:57	17:33	18:09		19:45	20:18		20:48
4	07:47	07:29	06:49	17:44 (101)	06:56	06:10		05:42
	16:58	17:35	18:10	4	17:48 (101)	19:46	11	06:41 (36) 20:49
5	07:47	07:28	06:48	17:41 (101)	06:54	06:08		05:42
	16:59	17:36	18:11	8	17:49 (101)	19:47	13	06:42 (36) 20:50
6	07:47	07:27	06:46	17:40 (101)	06:53	06:07		05:41
	17:00	17:37	18:13	11	17:51 (101)	19:48	15	06:42 (36) 20:50
7	07:47	07:25	06:44	17:38 (101)	06:51	06:06		05:41
	17:01	17:38	18:14	14	17:52 (101)	19:49	17	06:43 (36) 20:51
8	07:47	07:24	07:43	18:37 (101)	06:49	06:05		05:41
	17:02	17:40	19:15	16	18:53 (101)	19:51	19	06:44 (36) 20:52
9	07:47	07:23	07:41	18:37 (101)	06:48	06:03		05:40
	17:03	17:41	19:16	18	18:55 (101)	19:52	21	06:45 (36) 20:52
10	07:46	07:22	07:39	18:36 (101)	06:46	06:02		05:40
	17:04	17:42	19:17	20	18:56 (101)	19:53	22	06:45 (36) 20:53
11	07:46	07:20	07:38	18:35 (101)	06:44	06:01		05:40
	17:05	17:44	19:18	21	18:56 (101)	19:54	24	06:46 (36) 20:54
12	07:46	07:19	07:36	18:35 (101)	06:43	06:00		05:40
	17:06	17:45	19:20	22	18:57 (101)	19:55	25	06:46 (36) 20:54
13	07:46	07:18	07:34	18:36 (101)	06:41	05:59		05:40
	17:07	17:46	19:21	23	18:59 (101)	19:56	27	06:47 (36) 20:55
14	07:45	07:17	07:33	18:36 (101)	06:39	05:58		05:40
	17:08	17:48	19:22	22	18:58 (101)	19:57	28	06:47 (36) 20:55
15	07:45	07:15	07:31	18:36 (101)	06:38	05:57		05:40
	17:09	17:49	19:23	20	18:56 (101)	19:58	31	20:07 (111) 20:56
16	07:44	07:14	07:29	18:38 (101)	06:36	05:56		05:40
	17:10	17:50	19:24	17	18:55 (101)	20:00	35	20:08 (111) 20:56
17	07:44	07:12	07:27	18:39 (101)	06:34	05:55		05:40
	17:12	17:51	19:25	14	18:53 (101)	20:00	39	20:09 (111) 20:56
18	07:43	07:11	07:26	18:41 (101)	06:33	05:54		05:40
	17:13	17:53	19:27	9	18:50 (101)	20:01	42	20:10 (111) 20:57
19	07:43	07:09	07:24		06:31	05:53		05:40
	17:14	17:54	19:28		20:02	20:35	45	20:11 (111) 20:57
20	07:42	07:08	07:22		06:30	05:52		05:40
	17:15	17:55	19:29		20:03	20:36	52	20:12 (111) 20:57
21	07:41	07:07	07:20		06:28	05:51		05:40
	17:16	17:57	19:30		20:04	20:37	54	20:12 (111) 20:58
22	07:41	07:05	07:19		06:27	05:50		05:40
	17:18	17:58	19:31		20:05	20:38	58	20:14 (111) 20:58
23	07:40	07:04	07:17		06:25	05:49		05:41
	17:19	17:59	19:32		20:06	20:39	61	20:15 (111) 20:58
24	07:39	07:02	07:15		06:24	05:48		05:41
	17:20	18:00	19:34		20:07	20:40	62	20:15 (111) 20:58
25	07:38	07:00	07:13		06:22	05:48		05:41
	17:22	18:02	19:35		20:09	20:41	63	20:16 (111) 20:58
26	07:38	06:59	07:12		06:21	05:47		05:42
	17:23	18:03	19:36		20:10	20:41	64	20:17 (111) 20:59
27	07:37	06:57	07:10		06:19	05:46		05:42
	17:24	18:04	19:37		20:11	20:42	65	20:18 (111) 20:59
28	07:36	06:56	07:08		06:18	05:46		05:42
	17:25	18:05	19:38		20:12	20:43	66	20:19 (111) 20:59
29	07:35		07:06		06:16	05:45		05:43
	17:27		19:39		20:13	20:44	66	20:19 (111) 20:59
30	07:34		07:05		06:15	05:44		05:43
	17:28		19:40		20:14	20:45	67	20:20 (111) 20:59
31	07:33		07:03			05:44		05:43
	17:29		19:41			20:46	67	20:21 (111)
Potential sun hours	294	295	370		401	452		457
Total, worst case			239			1171		1839
Sun reduction			0.46			0.56		0.65
Oper. time red.			1.00			1.00		1.00
Wind dir. red.			0.63			0.64		0.61
Total reduction			0.29			0.36		0.40
Total, real			69			423		732

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 64

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 136 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1332)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

		July		August		September		October		November		December		
	1	05:44		06:26 (36)	06:09		06:31 (36)	06:42		07:14		18:15 (101)	06:50	07:26
		20:59	62	20:31 (111)	20:39	25	06:56 (36)	19:53		19:00	23	18:38 (101)	17:12	16:46
	2	05:44		06:25 (36)	06:10		06:32 (36)	06:43		07:15		18:14 (101)	06:51	07:28
		20:58	63	20:31 (111)	20:38	23	06:55 (36)	19:51		18:58	22	18:36 (101)	17:10	16:46
	3	05:45		06:25 (36)	06:11		06:33 (36)	06:44		07:16		18:13 (101)	06:53	07:29
		20:58	64	20:31 (111)	20:37	22	06:55 (36)	19:49		18:57	21	18:34 (101)	17:09	16:45
	4	05:45		06:25 (36)	06:12		06:34 (36)	06:45		07:17		18:13 (101)	06:54	07:30
		20:58	65	20:32 (111)	20:36	20	06:54 (36)	19:48		18:55	19	18:32 (101)	17:08	16:45
	5	05:46		06:24 (36)	06:13		06:35 (36)	06:46		07:18		18:13 (101)	06:55	07:31
		20:58	67	20:32 (111)	20:34	19	06:54 (36)	19:46		18:53	17	18:30 (101)	17:07	16:45
	6	05:47		06:24 (36)	06:14		06:36 (36)	06:47		07:19		18:14 (101)	06:56	07:32
		20:58	67	20:32 (111)	20:33	17	06:53 (36)	19:44		18:52	15	18:29 (101)	17:05	16:45
	7	05:47		06:24 (36)	06:15		06:37 (36)	06:48		07:20		18:15 (101)	06:58	07:33
		20:57	67	20:31 (111)	20:32	15	06:52 (36)	19:43		18:50	12	18:27 (101)	17:04	16:45
	8	05:48		06:24 (36)	06:16		06:38 (36)	06:49		07:22		18:16 (101)	06:59	07:34
		20:57	67	20:31 (111)	20:31	12	06:50 (36)	19:41		18:48	9	18:25 (101)	17:03	16:45
	9	05:49		06:24 (36)	06:17		06:39 (36)	06:50		07:23		18:17 (101)	07:00	07:34
		20:57	67	20:31 (111)	20:29	10	06:49 (36)	19:39		18:47	7	18:24 (101)	17:02	16:45
	10	05:49		06:23 (36)	06:18		06:40 (36)	06:51		07:24		18:20 (101)	07:01	07:35
		20:56	67	20:30 (111)	20:28	7	06:47 (36)	19:37		18:45	2	18:22 (101)	17:01	16:45
	11	05:50		06:23 (36)	06:19		06:41 (36)	06:52		07:25			07:03	07:36
		20:56	68	20:30 (111)	20:27	3	06:44 (36)	19:36		18:43			17:00	16:45
	12	05:51		06:23 (36)	06:20			06:53		07:26			07:04	07:37
		20:55	66	20:29 (111)	20:25			19:34		18:42			16:59	16:45
	13	05:52		06:22 (36)	06:22			06:54		07:27			07:05	07:38
		20:55	67	20:29 (111)	20:24			19:32		18:40			16:58	16:45
	14	05:52		06:21 (36)	06:23			06:55		07:28			07:06	07:39
		20:54	67	20:28 (111)	20:23			19:30		18:38			16:57	16:45
	15	05:53		06:21 (36)	06:24			06:57		07:30			07:08	07:39
		20:54	67	20:28 (111)	20:21			19:28		18:37			16:56	16:45
	16	05:54		06:21 (36)	06:25			06:58		07:31			07:09	07:40
		20:53	65	20:27 (111)	20:20			19:27		18:35			16:55	16:45
	17	05:55		06:21 (36)	06:26			06:59		07:32			07:10	07:41
		20:53	65	20:27 (111)	20:18			19:25		18:33			16:54	16:46
	18	05:56		06:21 (36)	06:27			07:00		07:33			07:11	07:41
		20:52	64	20:26 (111)	20:17			19:23		18:32			16:53	16:46
	19	05:57		06:20 (36)	06:28			07:01		07:34			07:12	07:42
		20:51	63	20:25 (111)	20:15			19:21		18:30			16:53	16:47
	20	05:57		06:20 (36)	06:29			07:02		07:35			07:14	07:43
		20:50	62	20:24 (111)	20:14			19:20		18:29			16:52	16:47
	21	05:58		06:21 (36)	06:30			07:03		07:37			07:15	07:43
		20:50	59	20:24 (111)	20:12			19:18		18:27			16:51	16:47
	22	05:59		06:22 (36)	06:31			07:04		07:38			07:16	07:44
		20:49	57	20:23 (111)	20:11			19:16		18:26			16:50	16:48
	23	06:00		06:23 (36)	06:32			07:05		07:39			07:17	07:44
		20:48	53	20:22 (111)	20:09			19:14		18:24			16:50	16:48
	24	06:01		06:24 (36)	06:33			07:06		07:40			07:19	07:45
		20:47	48	20:22 (111)	20:08			19:13		18:23			16:49	16:49
	25	06:02		06:25 (36)	06:34			07:07		07:41			07:20	07:45
		20:46	43	20:21 (111)	20:06			19:11	6	18:31 (101)	18:21		16:49	16:50
	26	06:03		06:26 (36)	06:35			07:08		18:22 (101)	07:43		07:21	07:45
		20:45	41	20:20 (111)	20:04			19:09	13	18:35 (101)	18:20		16:48	16:50
	27	06:04		06:27 (36)	06:36			07:09		18:20 (101)	07:44		07:22	07:46
		20:44	37	20:19 (111)	20:03			19:07	16	18:36 (101)	18:18		16:48	16:51
	28	06:05		06:28 (36)	06:37			07:10		18:18 (101)	07:45		07:23	07:46
		20:43	34	20:18 (111)	20:01			19:05	19	18:37 (101)	18:17		16:47	16:52
	29	06:06		06:29 (36)	06:39			07:12		18:17 (101)	07:46		07:24	07:46
		20:42	30	20:17 (111)	19:58			19:04	21	18:38 (101)	18:16		16:47	16:52
	30	06:07		06:30 (36)	06:40			07:13		18:15 (101)	07:48		07:25	07:47
		20:41	27	06:57 (36)	19:56			19:02	23	18:38 (101)	18:14		16:46	16:53
	31	06:08		06:30 (36)	06:41					07:49				07:47
		20:40	26	06:56 (36)	19:54					18:13				16:54
Potential sun hours		464			431			375		343			294	283
Total, worst case		1765			173					147				
Sun reduction		0.67			0.64			0.57		0.50				
Oper. time red.		1.00			1.00			1.00		1.00				
Wind dir. red.		0.63			0.67			0.63		0.63				
Total reduction		0.42			0.43			0.36		0.32				
Total, real		746			75			35		46				

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 65

Licensed user:

EDR

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Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar

Calculation: 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 138 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1334)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December			
1	07:47 16:55	07:32 17:31	06:54 18:06	07:01 19:43	06:14 20:15	06:42 (36) 19:53 (111)	05:43 20:47	05:44 20:59	06:09 20:39	19:22 (51) 19:41 (51)	06:42 19:53	07:03 (36) 19:00	07:14 19:00	06:50 17:12	07:26 16:46
2	07:47 16:56	07:31 17:32	06:53 18:08	07:00 19:44	06:12 20:16	06:42 (36) 19:53 (111)	05:43 20:47	05:44 20:58	06:10 20:38	19:09 (36) 19:57 (111)	06:43 19:51	07:04 (36) 18:58	07:15 17:10	06:51 17:10	07:28 16:46
3	07:47 16:57	07:30 17:33	06:51 18:09	06:58 19:45	06:11 20:18	06:43 (36) 19:55 (111)	05:42 20:48	05:45 20:58	06:11 20:37	19:03 (36) 19:59 (111)	06:44 19:49	07:05 (36) 18:57	07:16 17:09	06:53 17:09	07:29 16:45
4	07:47 16:58	07:29 17:35	06:49 18:10	06:56 19:46	06:10 20:19	06:44 (36) 19:55 (111)	05:42 20:49	05:45 20:58	06:12 20:36	19:00 (36) 20:00 (111)	06:45 19:48	07:17 18:55	07:17 17:08	06:54 17:08	07:30 16:45
5	07:47 16:59	07:28 17:36	06:48 18:11	06:54 19:47	06:08 20:20	06:45 (36) 19:55 (111)	05:42 20:50	05:46 20:58	06:13 20:34	19:58 (36) 20:02 (111)	06:46 19:46	07:18 18:53	07:18 17:07	06:55 17:07	07:31 16:45
6	07:47 17:00	07:27 17:37	06:46 18:13	06:53 19:48	06:07 20:21	06:46 (36) 19:53 (111)	05:41 20:50	05:47 20:58	06:14 20:33	19:56 (36) 20:03 (111)	06:47 19:44	07:19 18:52	07:19 17:05	06:56 17:05	07:32 16:45
7	07:47 17:01	07:25 17:38	06:44 18:14	06:51 19:49	06:06 20:22	06:47 (36) 19:53 (111)	05:41 20:51	05:47 20:57	06:15 20:32	19:55 (36) 20:03 (111)	06:48 19:43	07:20 18:50	07:20 17:04	06:58 17:04	07:33 16:45
8	07:47 17:02	07:24 17:40	06:43 19:15	06:49 19:51	06:05 20:23	06:49 (36) 19:52 (111)	05:41 20:52	05:48 20:57	06:16 20:31	19:54 (36) 20:04 (111)	06:49 19:41	07:22 18:48	07:22 17:03	06:59 17:03	07:34 16:45
9	07:47 17:03	07:23 17:41	06:41 19:16	06:48 19:52	6 07:07 (36) 07:13 (36)	06:03 20:24	06:51 (36) 19:50 (111)	05:49 20:52	06:17 20:29	19:57 (36) 20:04 (111)	06:50 19:39	07:23 18:47	07:23 17:02	07:00 17:02	07:34 16:45
10	07:46 17:04	07:22 17:42	06:39 19:17	06:46 19:53	07:05 (36) 07:15 (36)	06:02 20:25	06:55 (36) 19:49 (111)	05:49 20:53	06:18 20:28	19:59 (36) 20:03 (111)	06:51 19:37	07:24 18:45	07:24 17:01	07:01 17:01	07:35 16:45
11	07:46 17:05	07:20 17:44	06:38 19:18	06:44 19:54	07:04 (36) 07:18 (36)	06:01 20:26	19:12 (51) 19:45 (111)	05:50 20:54	06:19 20:27	19:58 (36) 20:02 (111)	06:52 19:36	07:25 18:43	07:25 17:00	07:03 17:00	07:36 16:45
12	07:46 17:06	07:19 17:45	06:36 19:20	06:43 19:55	07:02 (36) 07:19 (36)	06:00 20:27	19:13 (51) 19:30 (51)	05:50 20:54	06:20 20:25	19:57 (36) 20:00 (111)	06:53 19:34	07:26 18:42	07:26 17:05	07:04 17:05	07:37 16:45
13	07:46 17:07	07:18 17:46	06:34 19:21	06:41 19:56	07:00 (36) 07:20 (36)	05:59 20:28	19:16 (51) 19:28 (51)	05:52 20:55	06:22 20:24	19:56 (36) 19:59 (111)	06:54 19:32	07:27 18:40	07:27 17:06	07:05 17:06	07:38 16:45
14	07:45 17:08	07:16 17:47	06:32 19:22	06:39 19:57	06:59 (36) 19:29 (51)	05:58 20:30	05:40 20:55	05:52 20:54	06:23 20:23	19:54 (36) 19:58 (111)	06:55 19:30	07:28 18:38	07:28 17:07	07:06 17:07	07:39 16:45
15	07:45 17:09	07:15 17:49	06:31 19:23	06:38 19:58	06:57 (36) 19:33 (51)	05:57 20:31	05:40 20:56	05:53 20:54	06:24 20:21	19:53 (36) 19:56 (111)	06:57 19:28	07:30 18:37	07:30 17:08	07:08 17:08	07:40 16:45
16	07:44 17:10	07:14 17:50	06:29 19:24	06:36 20:00	06:56 (36) 19:36 (51)	05:56 20:32	05:40 20:53	05:54 20:55	06:25 20:20	19:52 (36) 19:56 (111)	06:58 19:27	07:31 18:35	07:31 17:09	07:09 17:09	07:40 16:45
17	07:44 17:12	07:12 17:51	06:27 19:25	06:34 20:00	06:54 (36) 19:37 (51)	05:55 20:33	05:40 20:53	05:55 20:53	06:26 20:18	19:51 (36) 19:54 (111)	06:59 19:25	07:32 18:33	07:32 17:10	07:10 17:10	07:41 16:46
18	07:43 17:13	07:11 17:53	06:26 19:27	06:33 20:01	06:52 (36) 19:38 (51)	05:54 20:34	05:40 20:52	05:56 20:52	06:27 20:17	19:50 (36) 19:53 (111)	07:00 19:23	07:33 18:32	07:33 17:11	07:11 17:11	07:41 16:46
19	07:43 17:14	07:09 17:54	06:24 19:28	06:31 20:02	06:51 (36) 19:40 (51)	05:53 20:35	05:40 20:51	05:57 20:51	06:28 20:15	19:50 (36) 19:51 (111)	07:01 19:21	07:34 18:30	07:34 17:12	07:12 17:12	07:42 16:46
20	07:42 17:15	07:08 17:55	06:22 19:29	06:30 20:03	06:49 (36) 19:40 (51)	05:52 20:36	05:40 20:50	05:57 20:50	06:29 20:14	19:49 (36) 19:50 (111)	07:02 19:20	07:35 18:29	07:35 17:14	07:14 17:14	07:43 16:47
21	07:41 17:16	07:07 17:57	06:20 19:30	06:28 20:04	06:48 (36) 19:42 (111)	05:51 20:37	05:40 20:50	05:58 20:50	06:30 20:12	19:48 (36) 19:48 (111)	07:03 19:18	07:37 18:27	07:37 17:15	07:15 17:15	07:43 16:47
22	07:41 17:18	07:05 17:58	06:19 19:31	06:27 20:05	06:46 (36) 19:43 (111)	05:50 20:38	05:40 20:50	05:59 20:49	06:31 20:11	19:47 (36) 19:47 (111)	07:04 19:16	07:38 18:26	07:38 17:16	07:16 17:16	07:44 16:48
23	07:40 17:19	07:04 17:59	06:17 19:32	06:25 20:06	06:45 (36) 19:44 (111)	05:49 20:39	05:41 20:50	06:00 20:48	06:32 20:09	19:46 (36) 19:45 (51)	07:05 19:14	07:39 18:24	07:39 17:17	07:17 17:17	07:44 16:48
24	07:39 17:20	07:02 18:00	06:15 19:34	06:24 20:07	06:43 (36) 19:45 (111)	05:48 20:40	05:41 20:50	06:01 20:47	06:33 20:08	19:45 (36) 19:43 (51)	07:06 19:13	07:40 18:23	07:40 17:19	07:19 17:19	07:45 16:49
25	07:38 17:22	07:00 18:02	06:13 19:35	06:22 20:09	06:42 (36) 19:46 (111)	05:48 20:41	05:41 20:50	06:02 20:46	06:34 20:06	19:44 (36) 19:42 (51)	07:07 19:11	07:41 18:21	07:41 17:20	07:20 17:20	07:45 16:50
26	07:38 17:23	06:59 18:03	06:12 19:36	06:21 20:10	06:41 (36) 19:48 (111)	05:47 20:41	05:42 20:50	06:03 20:45	06:35 20:04	19:43 (36) 19:40 (51)	07:08 19:09	07:43 18:20	07:43 17:21	07:21 17:21	07:45 16:50
27	07:37 17:24	06:57 18:04	06:10 19:37	06:19 20:11	06:40 (36) 19:48 (111)	05:46 20:42	05:42 20:50	06:04 20:44	06:36 20:03	19:42 (36) 19:38 (51)	07:09 19:07	07:44 18:18	07:44 17:22	07:22 17:22	07:46 16:51
28	07:36 17:25	06:56 18:05	06:08 19:38	06:18 20:12	06:41 (36) 19:50 (111)	05:46 20:43	05:42 20:50	06:05 20:43	06:37 20:01	19:41 (36) 19:35 (51)	07:10 19:05	07:45 18:17	07:45 17:23	07:23 17:23	07:46 16:52
29	07:35 17:27	06:56 18:06	06:06 19:39	06:16 20:13	06:41 (36) 19:50 (111)	05:45 20:44	05:43 20:50	06:06 20:42	06:39 20:00	19:40 (36) 19:30 (51)	07:12 19:04	07:46 18:16	07:46 17:24	07:24 17:24	07:46 16:52
30	07:34 17:28	06:55 18:07	06:05 19:40	06:15 20:14	06:41 (36) 19:52 (111)	05:44 20:45	05:43 20:50	06:07 20:41	06:40 20:01	19:39 (51) 19:36 (51)	07:13 19:02	07:47 18:14	07:47 17:25	07:25 17:25	07:47 16:53
31	07:33 17:29	06:54 18:08	06:04 19:41	06:14 20:15	06:40 20:46	06:33 (36) 19:53 (111)	05:44 20:50	06:08 20:40	06:41 20:02	19:38 (51) 19:39 (51)	07:14 19:03	07:48 18:13	07:48 17:26	07:26 17:26	07:47 16:54
Potential sun hours	294	295	370	401	452	457	464	431	375	343	294	283			
Total, worst case				1252	791		22	2018	30						
Sun reduction				0.51	0.56		0.67	0.64	0.57						
Oper. time red.				1.00	1.00		1.00	1.00	1.00						
Wind dir. red.				0.61	0.60		0.58	0.61	0.64						
Total reduction				0.31	0.34		0.39	0.39	0.36						
Total, real				391	267		9	786	11						

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

2015-08-31_Arkwright Summit_SFA

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Licensed user:

EDR217 Montgomery St.
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Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 139 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1335)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

January		February		March		April		May		June	
1	07:47	07:32		06:54		07:01		07:21 (36)	06:14	18:42 (51)	05:43
	16:55	17:31		18:06		19:43	26	07:47 (36)	20:15	19:45 (111)	20:47
2	07:47	07:31		06:53		07:00		07:19 (36)	06:12	18:43 (51)	05:43
	16:56	17:32		18:08		19:44	27	07:46 (36)	20:16	19:44 (111)	20:47
3	07:47	07:30		06:51		06:58		07:17 (36)	06:11	18:44 (51)	05:42
	16:57	17:33		18:09		19:45	35	19:08 (51)	20:18	19:43 (111)	20:48
4	07:47	07:29		06:49		06:56		07:15 (36)	06:10	18:46 (51)	05:42
	16:58	17:35		18:10		19:46	48	19:14 (51)	20:19	19:42 (111)	20:49
5	07:47	07:28		06:48		06:54		07:14 (36)	06:08	18:48 (51)	05:42
	16:59	17:36		18:11		19:47	56	19:17 (51)	20:20	19:40 (111)	20:50
6	07:47	07:27		06:46		06:53		07:12 (36)	06:07	18:50 (51)	05:41
	17:00	17:37	3	17:13 (101)	18:13	19:48	62	19:19 (51)	20:21	19:37 (111)	20:50
7	07:47	07:25		06:44		06:51		07:10 (36)	06:06	18:54 (51)	05:41
	17:01	17:38	6	17:14 (101)	18:14	19:49	66	19:20 (51)	20:22	19:34 (111)	20:51
8	07:47	07:24		07:43		06:49		07:11 (36)	06:05		05:41
	17:02	17:40	9	17:16 (101)	19:15	19:51	68	19:22 (51)	20:23		20:52
9	07:47	07:23		07:41		06:48		07:11 (36)	06:03		05:40
	17:03	17:41	12	17:17 (101)	19:16	19:52	69	19:23 (51)	20:24		20:52
10	07:46	07:22		07:39		06:46		07:11 (36)	06:02		05:40
	17:04	17:42	14	17:18 (101)	19:17	19:53	70	19:23 (51)	20:25		20:53
11	07:46	07:20		07:38		06:44		07:13 (36)	06:01		05:40
	17:05	17:44	16	17:20 (101)	19:18	19:54	68	19:24 (51)	20:26		20:54
12	07:46	07:19		07:36		06:43		07:13 (36)	06:00		05:40
	17:06	17:45	18	17:22 (101)	19:20	19:55	68	19:24 (51)	20:27		20:54
13	07:46	07:18		07:34		06:41		07:14 (36)	05:59		05:40
	17:07	17:46	20	17:23 (101)	19:21	19:56	66	19:24 (51)	20:28		20:55
14	07:45	07:17		07:33		06:39		07:17 (36)	05:58		05:40
	17:08	17:48	21	17:24 (101)	19:22	19:57	65	19:35 (111)	20:30		20:55
15	07:45	07:15		07:31		06:38		07:19 (36)	05:57		05:40
	17:09	17:49	23	17:25 (101)	19:23	19:58	66	19:36 (111)	20:31		20:56
16	07:44	07:14		07:29		06:36		18:39 (51)	05:56		05:40
	17:10	17:50	24	17:27 (101)	19:24	20:00	58	19:37 (111)	20:32		20:56
17	07:44	07:12		07:27		06:34		18:38 (51)	05:55		05:40
	17:12	17:51	23	17:27 (101)	19:26	20:00	60	19:38 (111)	20:33		20:56
18	07:43	07:11		07:26		06:33		18:37 (51)	05:54		05:40
	17:13	17:53	23	17:26 (101)	19:27	20:01	62	19:39 (111)	20:34		20:57
19	07:43	07:09		07:24		06:31		18:38 (51)	05:53		05:40
	17:14	17:54	20	17:25 (101)	19:28	20:02	62	19:40 (111)	20:35		20:57
20	07:42	07:08		07:22		06:30		18:37 (51)	05:52		05:40
	17:15	17:55	19	17:24 (101)	19:29	20:03	64	19:41 (111)	20:36		20:57
21	07:41	07:07		07:20		06:28		18:37 (51)	05:51		05:40
	17:16	17:57	16	17:23 (101)	19:30	20:04	65	19:42 (111)	20:37		20:58
22	07:41	07:05		07:19		06:27		18:37 (51)	05:50		05:40
	17:18	17:58	11	17:20 (101)	19:31	20:05	66	19:43 (111)	20:38		20:58
23	07:40	07:04		07:17		06:25		18:38 (51)	05:49		05:41
	17:19	17:59		07:17		20:06	66	19:44 (111)	20:39		20:58
24	07:39	07:02		07:15		06:24		18:37 (51)	05:48		05:41
	17:20	18:00		19:34	2	07:37 (36)	68	19:45 (111)	20:40		20:58
25	07:38	07:00		07:13		06:22		18:38 (51)	05:48		05:41
	17:22	18:02		19:35	7	07:40 (36)	68	19:46 (111)	20:41		20:58
26	07:38	06:59		07:12		06:21		18:39 (51)	05:47		05:42
	17:23	18:03		19:36	11	07:42 (36)	69	19:48 (111)	20:41		20:59
27	07:37	06:57		07:10		06:19		18:39 (51)	05:46		05:42
	17:24	18:04		19:37	14	07:43 (36)	69	19:48 (111)	20:42		20:59
28	07:36	06:56		07:08		06:18		18:40 (51)	05:46		05:42
	17:25	18:05		19:38	17	07:45 (36)	67	19:47 (111)	20:43		20:59
29	07:35			07:06		06:16		18:40 (51)	05:45		05:43
	17:27			19:39	20	07:46 (36)	66	19:46 (111)	20:44		20:59
30	07:34			07:05		06:15		18:41 (51)	05:44		05:43
	17:28			19:40	22	07:46 (36)	65	19:46 (111)	20:45		20:59
31	07:33			07:03		06:14			05:44		
	17:29			19:41	24	07:46 (36)			20:46		
Potential sun hours	294	295		370		401		452		457	
Total, worst case		278		117		1835		302			
Sun reduction		0.38		0.46		0.51		0.56			
Oper. time red.		1.00		1.00		1.00		1.00			
Wind dir. red.		0.68		0.63		0.60		0.59			
Total reduction		0.26		0.29		0.31		0.33			
Total, real		72		34		568		101			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

2015-08-31_Arkwright Summit_SFA

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Licensed user:

EDR

217 Montgomery St.

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Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 139 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1335)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	05:44	06:09	06:42	07:12 (36) 07:14	06:50	16:34 (101) 07:26
2	05:44	06:10	06:43	07:10 (36) 07:15	06:51	16:35 (101) 07:28
3	05:45	06:11	06:44	07:09 (36) 07:16	06:53	16:37 (101) 07:29
4	05:45	06:12	06:45	07:08 (36) 07:17	06:54	16:38 (101) 07:30
5	05:46	06:13	06:46	07:07 (36) 07:18	06:55	16:41 (101) 07:31
6	05:47	06:14	19:02 (51) 06:47	07:08 (36) 07:19	06:56	16:42 (101) 07:32
7	05:47	06:15	19:45 (111) 06:48	07:09 (36) 07:20	06:58	16:45
8	05:48	06:16	18:59 (51) 06:49	07:10 (36) 07:22	06:59	16:45
9	05:49	06:17	19:48 (111) 06:50	07:11 (36) 07:23	07:00	16:45
10	05:49	06:18	18:53 (51) 06:51	07:12 (36) 07:24	07:01	16:45
11	05:50	06:19	19:52 (111) 06:52	07:13 (36) 07:25	07:03	16:45
12	05:51	06:20	18:51 (51) 06:53	07:14 (36) 07:26	07:04	16:45
13	05:52	06:22	19:53 (111) 06:54	07:15 (36) 07:27	07:05	16:45
14	05:52	06:23	18:49 (51) 06:55	07:16 (36) 07:28	07:06	16:45
15	05:53	06:24	19:54 (111) 06:56	07:17 (36) 07:29	07:07	16:45
16	05:54	06:25	18:46 (51) 06:57	07:18 (36) 07:30	07:08	16:45
17	05:55	06:26	19:55 (111) 06:58	07:19 (36) 07:31	07:09	16:45
18	05:56	06:27	18:45 (51) 06:59	07:20 (36) 07:32	07:10	16:45
19	05:57	06:28	19:56 (111) 07:00	07:21 (36) 07:33	07:11	16:46
20	05:57	06:29	18:44 (51) 07:01	07:22 (36) 07:34	07:12	16:46
21	05:58	06:30	19:51 (111) 07:02	07:23 (36) 07:35	07:13	16:46
22	05:59	06:31	18:43 (51) 07:03	07:24 (36) 07:36	07:14	16:47
23	06:00	06:32	19:50 (111) 07:04	07:25 (36) 07:37	07:15	16:47
24	06:01	06:33	18:48 (111) 07:05	07:26 (36) 07:38	07:16	16:47
25	06:02	06:34	19:47 (111) 07:06	07:27 (36) 07:39	07:17	16:48
26	06:03	06:35	18:42 (51) 07:07	07:28 (36) 07:40	07:18	16:48
27	06:04	06:36	19:45 (111) 07:08	07:29 (36) 07:41	07:19	16:49
28	06:05	06:37	18:41 (51) 07:09	07:30 (36) 07:42	07:20	16:49
29	06:06	06:38	19:42 (111) 07:10	07:31 (36) 07:43	07:21	16:50
30	06:07	06:39	18:41 (51) 07:11	07:32 (36) 07:44	07:22	16:50
31	06:08	06:40	19:41 (111) 07:12	07:33 (36) 07:45	07:23	16:51
Potential sun hours	464	431	375	343	294	283
Total, worst case		1561	720	246	41	
Sun reduction		0.64	0.57	0.50	0.29	
Oper. time red.		1.00	1.00	1.00	1.00	
Wind dir. red.		0.60	0.62	0.68	0.68	
Total reduction		0.38	0.35	0.34	0.20	
Total, real		600	255	83	8	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

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Licensed user:

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Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 140 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1336)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117		541	386	285 8,759

Idle start wind speed: Cut in wind speed from power curve

	January		February		March		April		May		June		July		August		September		October		November		December	
1	07:47		09:15 (103)	07:32	06:54	07:01	06:14	05:43	05:44	06:09	06:42	07:14	06:50			07:26							09:04 (103)	
	16:55	85	16:05 (51)	17:31	18:06	19:43	20:15	20:47	20:59	20:39	19:53	19:00	17:12			16:46	79	15:52 (51)				16:46		
2	07:47		09:15 (103)	07:31	06:53	07:00	06:12	05:43	05:44	06:10	06:43	07:15	06:51			07:28							09:04 (103)	
	16:56	85	16:06 (51)	17:32	18:08	19:44	20:16	20:47	20:58	20:38	19:51	18:58	17:10			16:46	80	15:52 (51)				16:46		
3	07:47		09:16 (103)	07:30	06:51	06:58	06:11	05:42	05:45	06:11	06:44	07:16	06:53			07:29							09:04 (103)	
	16:57	85	16:06 (51)	17:33	18:09	19:45	20:18	20:48	20:58	20:37	19:49	18:57	17:09			16:45	82	15:53 (51)				16:45		
4	07:47		09:16 (103)	07:29	06:49	06:56	06:10	05:42	05:45	06:12	06:45	07:17	06:54			07:30							09:04 (103)	
	16:58	85	16:07 (51)	17:34	18:10	19:46	20:19	20:49	20:58	20:36	19:48	18:55	17:08			16:45	82	15:53 (51)				16:45		
5	07:47		09:17 (103)	07:28	06:48	06:54	06:08	05:42	05:46	06:13	06:46	07:18	06:55			07:31							09:04 (103)	
	16:59	84	16:07 (51)	17:36	18:11	19:47	20:20	20:50	20:58	20:34	19:46	18:53	17:07			16:45	83	15:54 (51)				16:45		
6	07:47		09:18 (103)	07:27	06:46	06:53	06:07	05:41	05:47	06:14	06:47	07:19	06:56			07:32							09:04 (103)	
	16:59	84	16:08 (51)	17:37	18:13	19:48	20:21	20:50	20:58	20:33	19:44	18:52	17:05			16:45	84	15:54 (51)				16:45		
7	07:47		09:19 (103)	07:25	06:44	06:51	06:06	05:41	05:47	06:15	06:48	07:20	06:58			07:33							09:04 (103)	
	17:00	83	16:08 (51)	17:38	18:14	19:49	20:22	20:51	20:57	20:32	19:43	18:50	17:04			16:45	84	15:54 (51)				16:45		
8	07:47		09:19 (103)	07:24	07:43	06:49	06:04	05:41	05:48	06:16	06:49	07:22	06:59			07:34							09:05 (103)	
	17:01	82	16:08 (51)	17:40	19:15	19:51	20:23	20:52	20:57	20:31	19:41	18:48	17:03			16:45	84	15:55 (51)				16:45		
9	07:47		09:20 (103)	07:23	07:41	06:48	06:03	05:40	05:49	06:17	06:50	07:23	07:00			07:34							09:05 (103)	
	17:03	82	16:09 (51)	17:41	19:16	19:52	20:24	20:52	20:57	20:29	19:39	18:46	17:02			16:45	85	15:55 (51)				16:45		
10	07:46		09:21 (103)	07:22	07:39	06:46	06:02	05:40	05:49	06:18	06:51	07:24	07:01			07:35							09:05 (103)	
	17:04	80	16:09 (51)	17:42	19:17	19:53	20:25	20:53	20:56	20:28	19:37	18:45	17:01			16:45	85	15:56 (51)				16:45		
11	07:46		09:22 (103)	07:20	07:38	06:44	06:01	05:40	05:50	06:19	06:52	07:25	07:03			07:36							09:05 (103)	
	17:05	79	16:10 (51)	17:44	19:18	19:54	20:26	20:54	20:56	20:27	19:36	18:43	17:00			16:45	85	15:55 (51)				16:45		
12	07:46		09:22 (103)	07:19	07:36	06:43	06:00	05:40	05:51	06:20	06:53	07:26	07:04			07:37							09:05 (103)	
	17:06	78	16:09 (51)	17:45	19:20	19:55	20:27	20:54	20:55	20:25	19:34	18:41	16:59			16:45	86	15:56 (51)				16:45		
13	07:46		09:23 (103)	07:18	07:34	06:41	05:59	05:40	05:51	06:22	06:54	07:27	07:05			07:38							09:06 (103)	
	17:07	77	16:10 (51)	17:46	19:21	19:56	20:29	20:55	20:55	20:24	19:32	18:40	16:58			16:45	86	15:57 (51)				16:45		
14	07:45		09:23 (103)	07:17	07:32	06:39	05:58	05:40	05:52	06:23	06:55	07:28	07:06						09:19 (103)	07:39	09:06 (103)			
	17:08	75	16:09 (51)	17:48	19:22	19:57	20:30	20:55	20:54	20:23	19:30	18:38	16:57	9		09:28 (103)	16:45	86	15:57 (51)			16:45		
15	07:45		09:25 (103)	07:15	07:31	06:38	05:57	05:40	05:53	06:24	06:57	07:30	07:08			09:15 (103)	07:39	86	15:57 (51)			16:45		
	17:09	73	16:10 (51)	17:49	19:23	19:58	20:31	20:56	20:54	20:21	19:28	18:37	16:56	19		09:34 (103)	16:45	86	15:58 (51)			16:45		
16	07:44		09:25 (103)	07:14	07:29	06:36	05:56	05:40	05:54	06:25	06:58	07:31	07:09			09:13 (103)	07:40	86	15:57 (51)			16:45		
	17:10	71	16:09 (51)	17:50	19:24	20:00	20:32	20:56	20:53	20:20	19:27	18:35	16:55	24		09:37 (103)	16:45	86	15:58 (51)			16:45		
17	07:44		09:27 (103)	07:12	07:27	06:34	05:55	05:40	05:55	06:26	06:59	07:32	07:10			09:10 (103)	07:41	86	15:58 (51)			16:45		
	17:12	67	16:09 (51)	17:51	19:25	20:00	20:33	20:56	20:53	20:18	19:25	18:33	16:54	29		09:39 (103)	16:46	85	15:58 (51)			16:45		
18	07:43		09:27 (103)	07:11	07:26	06:33	05:54	05:40	05:56	06:27	07:00	07:33	07:11			09:10 (103)	07:41	86	15:58 (51)			16:45		
	17:13	65	16:08 (51)	17:53	19:27	20:01	20:34	20:57	20:52	20:17	19:23	18:32	16:53	32		09:42 (103)	16:46	86	15:59 (51)			16:45		
19	07:43		09:28 (103)	07:09	07:24	06:31	05:53	05:40	05:56	06:28	07:01	07:34	07:13			09:08 (103)	07:42	86	15:59 (51)			16:45		
	17:14	61	16:07 (51)	17:54	19:28	20:02	20:35	20:57	20:51	20:15	19:21	18:30	16:53	35		09:43 (103)	16:46	87	15:59 (51)			16:45		
20	07:42		09:30 (103)	07:08	07:22	06:30	05:52	05:40	05:57	06:29	07:02	07:35	07:14			09:07 (103)	07:43	87	16:00 (51)			16:45		
	17:15	56	16:07 (51)	17:55	19:29	20:03	20:36	20:57	20:50	20:14	19:20	18:29	16:52	43		15:38 (51)	16:47	87	16:00 (51)			16:45		
21	07:41		09:31 (103)	07:07	07:20	06:28	05:51	05:40	05:58	06:30	07:03	07:37	07:15			09:06 (103)	07:43	87	16:00 (51)			16:45		
	17:16	51	16:06 (51)	17:56	19:30	20:04	20:37	20:58	20:50	20:12	19:18	18:27	16:51	51		15:41 (51)	16:47	87	16:00 (51)			16:45		
22	07:41		09:32 (103)	07:05	07:19	06:27	05:50	05:40	05:59	06:31	07:04	07:38	07:16			09:06 (103)	07:44	87	16:01 (51)			16:45		
	17:18	43	16:03 (51)	17:58	19:31	20:05	20:38	20:58	20:49	20:11	19:16	18:26	16:50	56		15:43 (51)	16:48	87	16:01 (51)			16:45		
23	07:40		09:33 (103)	07:04	07:17	06:25	05:49	05:41	06:00	06:32	07:05	07:39	07:17			09:05 (103)	07:44	87	16:01 (51)			16:45		
	17:19	35	10:08 (103)	17:59	19:32	20:06	20:39	20:58	20:48	20:09	19:14	18:24	16:50	60		15:44 (51)	16:48	87	16:01 (51)			16:45		
24	07:39		09:36 (103)	07:02	07:15	06:24	05:48	05:41	06:01	06:33	07:06	07:40	07:19			09:04 (103)	07:45	87	16:02 (51)			16:45		
	17:20	32	10:08 (103)	18:00	19:34	20:07	20:40	20:58	20:47	20:08	19:13	18:23	16:49	64		15:45 (51)	16:49	87	16:02 (51)			16:45		
25	07:38		09:37 (103)	07:00	07:13	06:22	05:48	05:41	06:02	06:34	07:07	07:41	07:20			09:05 (103)	07:45	87	16:02 (51)			16:45		
	17:21	29	10:06 (103)	18:02	19:35	20:09	20:41	20:58	20:46	20:06	19:11	18:21	16:49	67		15:47 (51)	16:49	87	16:02 (51)			16:45		
26	07:38		09:40 (103)	06:59	07:12	06:21	05:47	05:42	06:03	06:35	07:08	07:43	07:21			09:04 (103)	07:46	87	16:02 (51)			16:45		
	17:23	24	10:04 (103)	18:03	19:36	20:10	20:41	20:59	20:45	20:04	19:09	18:20	16:48	71		15:48 (51)	16:50	86	16:02 (51)			16:45		
27	07:37		09:43 (103)	06:57	07:10	06:19	05:46	05:42	06:04	06:36	07:09	07:44	07:22			09:04 (103)	07:46	87	16:03 (51)			16:45		
	17:24	18	10:01 (103)	18:04	19:37	20:11	20:42	20:59	20:44	20:03	19:07	18:18	16:48	73		15:49 (51)	16:51	86	16:03 (51)			16:45		
28	07:36		09:48 (103)	06:56	07:08	06:18	05:46	05:42	06:05	06:37	07:10	07:45	07:23			09:03 (103)	07:46	87	16:03 (51)			16:45		
	17:25	8	09:56 (103)	18:05	19:38	20:12	20:43	20:59	20:43	20:01	19:05	18:17	16:47	75		15:49 (51)	16:51	86	16:04 (51)			16:45		
29	07:35				07:06	06:16	05:45	05:43	06:06	06:39	07:12	07:46	07:24			09:03 (103)	07:46	87	16:04 (51)			16:45		
	17:27		</																					

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8/31/2015 1:05 PM / 69

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 142 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1338)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	January		February		March	April	May	June	July	August	September	October	November	December				
1	07:47		08:32 (103)	07:32	06:54	07:01	06:14	05:43	05:44	06:09	06:42	07:14	06:50		07:27	08:20 (103)		
	16:55	65	16:13 (111)	17:31	18:06	19:43	20:15	20:47	20:59	20:39	19:53	19:00	17:12	16:46	64	16:00 (111)		
2	07:47		08:33 (103)	07:31	06:53	07:00	06:12	05:43	05:44	06:10	06:43	07:15	06:51		07:28	08:20 (103)		
	16:56	66	16:14 (111)	17:32	18:08	19:44	20:16	20:47	20:58	20:38	19:51	18:58	17:10	16:46	65	16:01 (111)		
3	07:47		08:33 (103)	07:30	06:51	06:58	06:11	05:42	05:45	06:11	06:44	07:16	06:53		07:29	08:20 (103)		
	16:57	65	16:14 (111)	17:33	18:09	19:45	20:18	20:48	20:58	20:37	19:49	18:57	17:09	16:45	66	16:01 (111)		
4	07:47		08:34 (103)	07:29	06:49	06:56	06:10	05:42	05:45	06:12	06:45	07:17	06:54		07:30	08:20 (103)		
	16:58	66	16:15 (111)	17:35	18:10	19:46	20:19	20:49	20:58	20:36	19:48	18:55	17:08	16:45	65	16:01 (111)		
5	07:47		08:34 (103)	07:28	06:48	06:54	06:08	05:42	05:46	06:13	06:46	07:18	06:55		07:31	08:20 (103)		
	16:59	65	16:15 (111)	17:36	18:11	19:47	20:20	20:50	20:58	20:34	19:46	18:53	17:07	16:45	66	16:02 (111)		
6	07:47		08:35 (103)	07:27	06:46	06:53	06:07	05:41	05:47	06:14	06:47	07:19	06:56		07:32	08:21 (103)		
	16:59	66	16:16 (111)	17:37	18:13	19:48	20:21	20:50	20:58	20:33	19:44	18:52	17:05	16:45	66	16:02 (111)		
7	07:47		08:35 (103)	07:25	06:44	06:51	06:06	05:41	05:47	06:15	06:48	07:20	06:58		07:33	08:21 (103)		
	17:00	66	16:17 (111)	17:38	18:14	19:49	20:22	20:51	20:57	20:32	19:43	18:50	17:04	16:45	66	16:03 (111)		
8	07:47		08:35 (103)	07:24	07:43	06:49	06:04	05:41	05:48	06:16	06:49	07:22	06:59		07:34	08:22 (103)		
	17:02	65	16:16 (111)	17:40	19:15	19:51	20:23	20:52	20:57	20:31	19:41	18:48	17:03	16:45	66	16:03 (111)		
9	07:47		08:36 (103)	07:23	07:41	06:48	06:03	05:40	05:49	06:17	06:50	07:23	07:00		07:34	08:22 (103)		
	17:03	66	16:17 (111)	17:41	19:16	19:52	20:24	20:52	20:57	20:29	19:39	18:47	17:02	16:45	65	16:03 (111)		
10	07:46		08:37 (103)	07:22	07:39	06:46	06:02	05:40	05:49	06:18	06:51	07:24	07:01		07:35	08:23 (103)		
	17:04	65	16:18 (111)	17:42	19:17	19:53	20:25	20:53	20:56	20:28	19:37	18:45	17:01	16:45	65	16:04 (111)		
11	07:46		08:38 (103)	07:20	07:38	06:44	06:01	05:40	05:50	06:19	06:52	07:25	07:03		07:36	08:22 (103)		
	17:05	64	16:18 (111)	17:44	19:18	19:54	20:26	20:54	20:56	20:27	19:36	18:43	17:00	16:45	65	16:03 (111)		
12	07:46		08:37 (103)	07:19	07:36	06:43	06:00	05:40	05:51	06:20	06:53	07:26	07:04		07:37	08:23 (103)		
	17:06	64	16:18 (111)	17:45	19:20	19:55	20:27	20:54	20:55	20:25	19:34	18:42	16:59	16:45	65	16:04 (111)		
13	07:46		08:38 (103)	07:18	07:34	06:41	05:59	05:40	05:52	06:22	06:54	07:27	07:05		07:38	08:24 (103)		
	17:07	64	16:19 (111)	17:46	19:21	19:56	20:29	20:55	20:55	20:24	19:32	18:40	16:58	16:45	64	16:04 (111)		
14	07:45		08:39 (103)	07:17	07:33	06:39	05:58	05:40	05:52	06:23	06:55	07:28	07:06		08:31 (103)	07:39	08:24 (103)	
	17:08	62	16:18 (111)	17:48	19:22	19:57	20:30	20:55	20:54	20:23	19:30	18:38	16:57	4	08:35 (103)	16:45	65	16:05 (111)
15	07:45		08:40 (103)	07:15	07:31	06:38	05:57	05:40	05:53	06:24	06:57	07:30	07:08		08:27 (103)	07:39	08:25 (103)	
	17:09	61	16:19 (111)	17:49	19:23	19:58	20:31	20:56	20:54	20:21	19:28	18:37	16:56	13	08:40 (103)	16:45	65	16:06 (111)
16	07:44		08:40 (103)	07:14	07:29	06:36	05:56	05:40	05:54	06:25	06:58	07:31	07:09		08:25 (103)	07:40	08:25 (103)	
	17:10	61	16:19 (111)	17:50	19:24	20:00	20:32	20:56	20:53	20:20	19:27	18:35	16:55	18	08:43 (103)	16:45	64	16:05 (111)
17	07:44		08:41 (103)	07:12	07:27	06:34	05:55	05:40	05:55	06:26	06:59	07:32	07:10		08:23 (103)	07:41	08:26 (103)	
	17:12	58	16:19 (111)	17:51	19:26	20:00	20:33	20:56	20:53	20:18	19:25	18:33	16:54	21	08:44 (103)	16:46	63	16:06 (111)
18	07:43		08:42 (103)	07:11	07:26	06:33	05:54	05:40	05:56	06:27	07:00	07:33	07:11		08:22 (103)	07:41	08:27 (103)	
	17:13	56	16:18 (111)	17:53	19:27	20:01	20:34	20:57	20:52	20:17	19:23	18:32	16:53	32	15:47 (111)	16:46	63	16:07 (111)
19	07:43		08:42 (103)	07:10	07:24	06:31	05:53	05:40	05:57	06:28	07:01	07:34	07:13		08:21 (103)	07:42	08:26 (103)	
	17:14	54	16:18 (111)	17:54	19:28	20:02	20:35	20:57	20:51	20:15	19:21	18:30	16:53	40	15:50 (111)	16:46	64	16:07 (111)
20	07:42		08:44 (103)	07:08	07:22	06:30	05:52	05:40	05:57	06:29	07:02	07:35	07:14		08:20 (103)	07:43	08:27 (103)	
	17:15	51	16:18 (111)	17:55	19:29	20:03	20:36	20:57	20:50	20:14	19:20	18:29	16:52	44	15:51 (111)	16:47	63	16:07 (111)
21	07:41		08:44 (103)	07:07	07:20	06:28	05:51	05:40	05:58	06:30	07:03	07:37	07:15		08:19 (103)	07:43	08:27 (103)	
	17:16	49	16:17 (111)	17:57	19:30	20:04	20:37	20:58	20:50	20:12	19:18	18:27	16:51	49	15:52 (111)	16:47	63	16:07 (111)
22	07:41		08:45 (103)	07:05	07:19	06:27	05:50	05:40	05:59	06:31	07:04	07:38	07:16		08:20 (103)	07:44	08:28 (103)	
	17:18	44	16:16 (111)	17:58	19:31	20:05	20:38	20:58	20:49	20:11	19:16	18:26	16:50	51	15:54 (111)	16:48	63	16:08 (111)
23	07:40		08:46 (103)	07:04	07:17	06:25	05:49	05:41	06:00	06:32	07:05	07:39	07:17		08:19 (103)	07:44	08:28 (103)	
	17:19	40	16:15 (111)	17:59	19:32	20:06	20:39	20:58	20:48	20:09	19:14	18:24	16:50	54	15:55 (111)	16:48	63	16:08 (111)
24	07:39		08:48 (103)	07:02	07:15	06:24	05:48	05:41	06:01	06:33	07:06	07:40	07:19		08:19 (103)	07:45	08:29 (103)	
	17:20	32	16:13 (111)	18:00	19:34	20:07	20:40	20:58	20:47	20:08	19:13	18:23	16:49	56	15:55 (111)	16:49	63	16:09 (111)
25	07:38		08:50 (103)	07:00	07:13	06:22	05:48	05:41	06:02	06:34	07:07	07:41	07:20		08:19 (103)	07:45	08:29 (103)	
	17:22	21	09:11 (103)	18:02	19:35	20:09	20:41	20:58	20:46	20:06	19:11	18:21	16:49	58	15:57 (111)	16:50	64	16:10 (111)
26	07:38		08:52 (103)	06:59	07:12	06:21	05:47	05:42	06:03	06:35	07:08	07:43	07:21		08:19 (103)	07:46	08:30 (103)	
	17:23	18	09:10 (103)	18:03	19:36	20:10	20:41	20:59	20:45	20:04	19:09	18:20	16:48	61	15:58 (111)	16:50	63	16:10 (111)
27	07:37		08:54 (103)	06:57	07:10	06:19	05:46	05:42	06:04	06:36	07:09	07:44	07:22		08:19 (103)	07:46	08:30 (103)	
	17:24	13	09:07 (103)	18:04	19:37	20:11	20:42	20:59	20:44	20:03	19:07	18:18	16:48	61	15:58 (111)	16:51	64	16:10 (111)
28	07:36		09:00 (103)	06:56	07:08	06:18	05:46	05:42	06:05	06:37	07:10	07:45	07:23		08:19 (103)	07:46	08:31 (103)	
	17:25	2	09:02 (103)	18:05	19:38	20:12	20:43	20:59	20:43	20:01	19:05	18:17	16:47	62	15:58 (111)	16:52	64	16:11 (111)
29	07:35				07:06	06:16	05:45	05:43	06:06	06:39	07:12	07:46	07:24		08:19 (103)	07:46	08:31 (103)	
	17:27				19:39	20:13	20:44	20:59	20:42	19:58	19:04	18:16	16:47	63	15:59 (111)	16:52	65	16:12 (111)
30	07:34				07:05	06:15	05:44	05:43	06:07	06:40	07:13	07:48	07:25		08:19 (103)	07:47	08:31 (103)	
	17:28				19:40	20:14	20:45	20:59	20:41	19:56	19:02	18:14	16:46	63	15:59 (111)	16:53	65	16:12 (111)
31	07:33				07:03		05:44		06:08	06:41		07:49						
	17:29				19:41		20:46		20:40	19:55		18:13						
Potential sun hours	294		295		370	401	452	457	464	431	375	343	294		283			
Total, worst case	1469												750		1997			
Sun reduction	0.31												0.29		0.27			
Oper. time red.	1.00												1.00		1.00			
Wind dir. red.	0.63												0.62		0.63			
Total reduction	0.19												0.18		0.17			
Total, real	286												136		339			

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2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 70

Licensed user:

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Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 145 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1341)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:47	07:32	06:54	07:01	06:14	05:43	06:17 (47)	05:44	06:21 (47)	06:09	06:42	07:14
	16:55	17:31	18:07	19:43	20:15	20:47	06:43 (47)	20:59	29	06:50 (47)	20:39	19:53
2	07:47	07:31	06:53	07:00	06:12	05:43	06:16 (47)	05:44	06:21 (47)	06:10	06:43	07:15
	16:56	17:32	18:08	19:44	20:17	20:48	27	06:43 (47)	20:59	30	06:51 (47)	20:38
3	07:47	07:30	06:51	06:58	06:11	05:43	06:16 (47)	05:45	06:21 (47)	06:11	06:44	07:16
	16:57	17:33	18:09	19:45	20:18	20:48	28	06:44 (47)	20:58	29	06:50 (47)	20:37
4	07:47	07:29	06:49	06:56	06:10	05:42	06:15 (47)	05:45	06:22 (47)	06:12	06:45	07:17
	16:58	17:35	18:10	19:46	20:19	20:49	28	06:43 (47)	20:58	29	06:51 (47)	20:36
5	07:47	07:28	06:48	06:55	06:08	05:42	06:16 (47)	05:46	06:22 (47)	06:13	06:46	07:18
	16:59	17:36	18:11	19:47	20:20	20:50	28	06:44 (47)	20:58	28	06:50 (47)	20:35
6	07:47	07:27	06:46	06:53	06:07	05:41	06:16 (47)	05:47	06:22 (47)	06:14	06:47	07:19
	17:00	17:37	18:13	19:48	20:21	20:51	29	06:45 (47)	20:58	29	06:51 (47)	20:33
7	07:47	07:26	06:44	06:51	06:06	05:41	06:16 (47)	05:47	06:22 (47)	06:15	06:48	07:21
	17:01	17:39	18:14	19:49	20:22	20:51	29	06:45 (47)	20:57	28	06:50 (47)	20:32
8	07:47	07:24	07:43	06:49	06:05	05:41	06:16 (47)	05:48	06:23 (47)	06:16	06:49	07:22
	17:02	17:40	19:15	19:51	20:23	20:52	29	06:45 (47)	20:57	28	06:51 (47)	20:31
9	07:47	07:23	07:41	06:48	06:03	05:41	06:16 (47)	05:49	06:23 (47)	06:17	06:50	07:23
	17:03	17:41	19:16	19:52	20:24	20:52	29	06:45 (47)	20:57	28	06:51 (47)	20:29
10	07:47	07:22	07:39	06:46	06:02	05:40	06:16 (47)	05:49	06:24 (47)	06:18	06:51	07:24
	17:04	17:43	19:17	19:53	20:25	20:53	29	06:45 (47)	20:56	27	06:51 (47)	20:28
11	07:46	07:21	07:38	06:44	06:01	05:40	06:17 (47)	05:50	06:24 (47)	06:20	06:52	07:25
	17:05	17:44	19:19	19:54	20:26	20:54	29	06:46 (47)	20:56	26	06:50 (47)	20:27
12	07:46	07:19	07:36	06:43	06:00	05:40	06:17 (47)	05:51	06:24 (47)	06:21	06:53	07:26
	17:06	17:45	19:20	19:55	20:28	20:54	29	06:46 (47)	20:55	26	06:50 (47)	20:25
13	07:46	07:18	07:34	06:41	05:59	05:40	06:17 (47)	05:52	06:25 (47)	06:22	06:55	07:27
	17:07	17:46	19:21	19:56	20:29	20:55	29	06:46 (47)	20:55	26	06:51 (47)	20:24
14	07:45	07:17	07:33	06:39	05:58	05:40	06:17 (47)	05:52	06:25 (47)	06:23	06:56	07:28
	17:08	17:48	19:22	19:57	20:30	20:55	30	06:47 (47)	20:54	24	06:49 (47)	20:23
15	07:45	07:15	07:31	06:38	05:57	05:40	06:18 (47)	05:53	06:26 (47)	06:24	06:57	07:30
	17:09	17:49	19:23	19:59	20:31	20:56	29	06:47 (47)	20:54	23	06:49 (47)	20:21
16	07:44	07:14	07:29	06:36	05:56	05:40	06:18 (47)	05:54	06:27 (47)	06:25	06:58	07:31
	17:11	17:50	19:24	20:00	20:32	20:56	29	06:47 (47)	20:53	22	06:49 (47)	20:20
17	07:44	07:12	07:27	06:35	05:55	05:40	06:18 (47)	05:55	06:28 (47)	06:26	06:59	07:32
	17:12	17:52	19:26	20:00	20:33	20:57	29	06:47 (47)	20:53	21	06:49 (47)	20:18
18	07:43	07:11	07:26	06:33	05:54	05:40	06:18 (47)	05:56	06:29 (47)	06:27	07:00	07:33
	17:13	17:53	19:27	20:01	20:34	20:57	29	06:47 (47)	20:52	19	06:48 (47)	20:17
19	07:43	07:10	07:24	06:31	05:53	05:40	06:18 (47)	05:57	06:30 (47)	06:28	07:01	07:34
	17:14	17:54	19:28	20:02	20:35	20:57	29	06:47 (47)	20:51	18	06:48 (47)	20:15
20	07:42	07:08	07:22	06:30	05:52	05:40	06:18 (47)	05:58	06:30 (47)	06:29	07:02	07:36
	17:15	17:55	19:29	20:03	20:36	20:58	29	06:47 (47)	20:50	16	06:46 (47)	20:14
21	07:41	07:07	07:20	06:28	05:51	05:40	06:18 (47)	05:58	06:32 (47)	06:30	07:03	07:37
	17:17	17:57	19:30	20:04	20:37	4	06:30 (47)	20:58	12	06:44 (47)	20:12	19:18
22	07:41	07:05	07:19	06:27	05:50	05:41	06:19 (47)	05:59	06:34 (47)	06:31	07:04	07:38
	17:18	17:58	19:31	20:05	20:38	11	06:34 (47)	20:58	8	06:42 (47)	20:11	19:16
23	07:40	07:04	07:17	06:25	05:49	05:41	06:19 (47)	06:00	06:32	07:05	07:39	07:17
	17:19	17:59	19:32	20:06	20:39	15	06:36 (47)	20:58	20:09	19:14	18:24	16:50
24	07:39	07:02	07:15	06:24	05:49	05:41	06:19 (47)	06:01	06:33	07:06	07:40	07:19
	17:20	18:00	19:34	20:08	20:40	17	06:37 (47)	20:58	20:08	19:13	18:23	16:49
25	07:39	07:01	07:14	06:22	05:48	05:41	06:20 (47)	06:02	06:34	07:07	07:42	07:20
	17:22	18:02	19:35	20:09	20:41	18	06:38 (47)	20:59	20:06	19:11	18:21	16:49
26	07:38	06:59	07:12	06:21	05:47	05:42	06:19 (47)	06:03	06:35	07:08	07:43	07:21
	17:23	18:03	19:36	20:10	20:42	20	06:39 (47)	20:59	20:04	19:09	18:20	16:48
27	07:37	06:57	07:10	06:19	05:46	05:42	06:18 (47)	06:04	06:37	07:09	07:44	07:22
	17:24	18:04	19:37	20:11	20:42	21	06:39 (47)	20:59	20:03	19:07	18:19	16:48
28	07:36	06:56	07:08	06:18	05:46	05:43	06:20 (47)	06:05	06:38	07:11	07:45	07:23
	17:25	18:05	19:38	20:12	20:43	23	06:41 (47)	20:59	20:01	19:06	18:17	16:47
29	07:35	07:07	07:07	06:16	05:45	05:43	06:20 (47)	06:06	06:39	07:12	07:46	07:24
	17:27	18:07	19:39	20:13	20:44	24	06:41 (47)	20:59	20:00	19:04	18:16	16:47
30	07:34	07:05	07:05	06:15	05:45	05:43	06:21 (47)	06:07	06:40	07:13	07:48	07:25
	17:28	18:08	19:40	20:14	20:45	25	06:42 (47)	20:59	19:56	19:02	18:14	16:46
31	07:33	07:03	07:03	06:14	05:44	05:41	06:16 (47)	06:08	06:41	07:14	07:49	07:26
	17:29	18:09	19:42	20:16	20:46	26	06:42 (47)	20:40	19:55	18:13	16:47	16:54
Potential sun hours	294	295	370	401	452	457	464	431	375	343	294	283
Total, worst case												
Sun reduction					0.56		0.65					
Oper. time red.					1.00		1.00					
Wind dir. red.					0.68		0.68					
Total reduction					0.38		0.44					
Total, real					78		383					

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)

Project:

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Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 147 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1343)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June
1	07:47	07:32	06:54	07:01	06:14	05:43
	16:55	17:31	18:07	19:43	20:15	20:47
2	07:47	07:31	06:53	07:00	06:12	05:43
	16:56	17:32	18:08	19:44	20:17	20:48
3	07:47	07:30	06:51	06:58	06:11	05:43
	16:57	17:33	18:09	19:45	20:18	20:48
4	07:47	07:29	06:49	06:56	06:10	05:42
	16:58	17:35	18:10	19:46	20:19	20:49
5	07:47	07:28	06:48	06:54	06:08	05:42
	16:59	17:36	18:11	19:47	20:20	20:50
6	07:47	07:27	06:46	07:14 (43)	06:53	06:07
	17:00	17:37	18:13	2 07:16 (43)	19:48	20:21
7	07:47	07:26	06:44	07:08 (43)	06:51	06:06
	17:01	17:39	18:14	12 07:20 (43)	19:49	2 07:18 (101)
8	07:47	07:24	07:43	08:06 (43)	06:49	07:12 (101)
	17:02	17:40	19:15	16 08:22 (43)	19:51	11 07:23 (101)
9	07:47	07:23	07:41	08:05 (43)	06:48	07:09 (101)
	17:03	17:41	19:16	19 08:24 (43)	19:52	16 07:25 (101)
10	07:47	07:22	07:39	08:03 (43)	06:46	07:07 (101)
	17:04	17:42	19:17	21 08:24 (43)	19:53	18 07:25 (101)
11	07:46	07:21	07:38	08:02 (43)	06:44	07:06 (101)
	17:05	17:44	19:19	22 08:24 (43)	19:54	4 06:38 (47)
12	07:46	07:19	07:36	08:02 (43)	06:43	07:05 (101)
	17:06	17:45	19:20	23 08:25 (43)	19:55	12 06:46 (47)
13	07:46	07:18	07:34	08:01 (43)	06:41	07:04 (101)
	17:07	17:46	19:21	24 08:25 (43)	19:56	17 06:49 (47)
14	07:45	07:17	07:33	08:01 (43)	06:39	07:04 (101)
	17:08	17:48	19:22	23 08:24 (43)	19:57	20 06:50 (47)
15	07:45	07:15	07:31	08:01 (43)	06:38	07:03 (101)
	17:09	17:49	19:23	22 08:23 (43)	19:59	23 06:52 (47)
16	07:44	07:14	07:29	08:02 (43)	06:36	07:03 (101)
	17:11	17:50	19:24	21 08:23 (43)	20:00	24 06:53 (47)
17	07:44	07:12	07:27	08:02 (43)	06:35	07:03 (101)
	17:12	17:52	19:26	20 08:22 (43)	20:00	23 07:26 (101)
18	07:43	07:11	07:26	08:02 (43)	06:33	07:04 (101)
	17:13	17:53	19:27	18 08:20 (43)	20:01	22 07:26 (101)
19	07:43	07:10	07:24	08:03 (43)	06:31	07:04 (101)
	17:14	17:54	19:28	15 08:18 (43)	20:02	20 07:24 (101)
20	07:42	07:08	07:22	08:06 (43)	06:30	07:04 (101)
	17:15	17:55	19:29	10 08:16 (43)	20:03	19 07:23 (101)
21	07:41	07:07	07:20	06:28	07:06 (101)	05:51
	17:17	17:57	19:30	20:04	16 07:22 (101)	20:37
22	07:41	07:05	07:19	06:27	07:07 (101)	05:50
	17:18	17:58	19:31	20:05	12 07:19 (101)	20:38
23	07:40	07:04	07:17	06:25	07:10 (101)	05:49
	17:19	17:59	19:32	20:06	6 07:16 (101)	20:39
24	07:39	07:02	07:15	06:24	05:49	06:23 (47)
	17:20	18:00	19:34	20:08	34 06:57 (47)	20:58
25	07:39	07:01	07:14	06:22	05:48	06:23 (47)
	17:22	18:02	19:35	20:09	35 06:58 (47)	20:59
26	07:38	06:59	07:12	06:21	05:47	06:23 (47)
	17:23	18:03	19:36	20:10	35 06:58 (47)	20:59
27	07:37	06:57	07:10	06:19	05:46	06:23 (47)
	17:24	18:04	19:37	20:11	35 06:58 (47)	20:59
28	07:36	06:56	07:08	06:18	05:46	06:23 (47)
	17:25	18:05	19:38	20:12	36 06:59 (47)	20:59
29	07:35		07:07	06:16	05:45	06:23 (47)
	17:27		19:39	20:13	35 06:58 (47)	20:59
30	07:34		07:05	06:15	05:45	06:23 (47)
	17:28		19:40	20:14	36 06:59 (47)	20:59
31	07:33		07:03		05:44	06:23 (47)
	17:29		19:42		36 06:59 (47)	
Potential sun hours	294	295	370	401	452	457
Total, worst case			268	302	600	1037
Sun reduction			0.46	0.51	0.56	0.65
Oper. time red.			1.00	1.00	1.00	1.00
Wind dir. red.			0.59	0.63	0.67	0.67
Total reduction			0.27	0.32	0.38	0.44
Total, real			73	97	226	453

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 147 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1343)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

July		August		September		October		November		December	
1	05:44	06:30 (47)	06:09	06:46 (47)	06:42	07:05 (101)	07:14	07:41 (43)	06:50	07:27	
2	05:44	06:30 (47)	06:10	06:56 (47)	06:43	07:26 (101)	07:15	08:04 (43)	07:12	07:28	
3	05:45	06:30 (47)	06:11		06:44	07:24 (101)	07:16	08:03 (43)	07:10	07:29	
4	05:45	06:30 (47)	06:12		06:45	07:23 (101)	07:17	08:02 (43)	07:09	07:30	
5	05:46	06:30 (47)	06:13		06:46	07:20 (101)	07:18	07:43 (43)	06:55	07:31	
6	05:47	06:30 (47)	06:14		06:47	07:15 (101)	07:19	08:00 (43)	07:07	07:32	
7	05:47	06:30 (47)	06:15		06:48		07:20	07:44 (43)	06:56	07:33	
8	05:48	06:30 (47)	06:16		06:49		07:22	07:58 (43)	06:58	07:34	
9	05:49	06:31 (47)	06:17		06:50		07:23	07:55 (43)	06:59	07:35	
10	05:49	06:31 (47)	06:18		06:51		07:24		07:00	07:36	
11	05:50	06:31 (47)	06:20		06:52		07:25		07:01	07:37	
12	05:51	06:31 (47)	06:21		06:53		07:26		07:02	07:38	
13	05:52	06:32 (47)	06:22		06:55		07:27		07:03	07:39	
14	05:52	06:32 (47)	06:23		06:56		07:28		07:04	07:40	
15	05:53	06:32 (47)	06:24		06:57		07:30		07:05	07:41	
16	05:54	06:32 (47)	06:25		06:58		07:31		07:06	07:42	
17	05:55	06:32 (47)	06:26		06:59		07:32		07:07	07:43	
18	05:56	06:33 (47)	06:27		07:00		07:33		07:08	07:44	
19	05:57	06:33 (47)	06:28		07:01		07:34		07:09	07:45	
20	05:58	06:33 (47)	06:29	07:15 (101)	07:02		07:35		07:10	07:46	
21	05:58	06:33 (47)	06:30	07:23 (101)	07:03		07:37		07:11	07:47	
22	05:59	06:34 (47)	06:31	07:25 (101)	07:04		07:38		07:12	07:48	
23	06:00	06:34 (47)	06:32	07:27 (101)	07:05	07:51 (43)	07:39		07:13	07:49	
24	06:01	06:35 (47)	06:33	07:28 (101)	07:06	07:59 (43)	07:40		07:14	07:50	
25	06:02	06:36 (47)	06:34	07:29 (101)	07:07	08:02 (43)	07:42		07:15	07:51	
26	06:03	06:37 (47)	06:35	07:30 (101)	07:08	08:03 (43)	07:43		07:16	07:52	
27	06:04	06:37 (47)	06:36	07:31 (101)	07:09	08:04 (43)	07:44		07:17	07:53	
28	06:05	06:38 (47)	06:38	07:32 (101)	07:10	08:05 (43)	07:45		07:18	07:54	
29	06:06	06:40 (47)	06:39	07:33 (101)	07:11	08:06 (43)	07:46		07:19	07:55	
30	06:07	06:41 (47)	06:40	07:34 (101)	07:12	08:07 (43)	07:47		07:20	07:56	
31	06:08	06:43 (47)	06:41	07:35 (101)	07:13	08:08 (43)	07:48		07:21	07:57	
Potential sun hours	464	431		375		343		294	283		
Total, worst case	1001	248		218		126					
Sun reduction	0.67	0.64		0.57		0.50					
Oper. time red.	1.00	1.00		1.00		1.00					
Wind dir. red.	0.67	0.63		0.60		0.59					
Total reduction	0.45	0.40		0.34		0.29					
Total, real	451	100		75		37					

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

2015-08-31_Arkwright Summit_SFA

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Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 148 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1344)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

January		February		March		April		May		June	
1	07:47	07:32		06:54		07:29 (41)	07:01	27	07:32 (43)	06:14	
	16:55	17:31		18:07	22	07:51 (41)	19:43		07:59 (43)	20:15	17
2	07:47	07:31		06:53		07:30 (41)	07:00	26	07:32 (43)	06:12	
	16:56	17:32		18:08	20	07:50 (41)	19:44		07:58 (43)	20:17	20
3	07:47	07:30		06:51		07:32 (41)	06:58	24	07:32 (43)	06:11	
	16:57	17:33		18:09	17	07:49 (41)	19:45		07:56 (43)	20:18	22
4	07:47	07:29		06:49		07:33 (41)	06:56	23	07:33 (43)	06:10	
	16:58	17:35		18:10	13	07:46 (41)	19:46		07:56 (43)	20:19	23
5	07:47	07:28		06:48		07:36 (41)	06:54	20	07:34 (43)	06:08	
	16:59	17:36		18:11	6	07:42 (41)	19:47		07:54 (43)	20:20	25
6	07:47	07:27		06:46			06:53	17	07:35 (43)	06:07	
	17:00	17:37		18:13			19:48		07:52 (43)	20:21	25
7	07:47	07:25		06:44			06:51	12	07:37 (43)	06:06	
	17:01	17:39		18:14			19:49		07:49 (43)	20:22	26
8	07:47	07:24		07:43			06:49			06:05	
	17:02	17:40		19:15			19:51			20:23	26
9	07:47	07:23		07:41			06:48			06:03	
	17:03	17:41		19:16			19:52			20:24	26
10	07:47	07:22		07:39			06:46			06:02	
	17:04	17:42		19:17			19:53			20:25	26
11	07:46	07:21		07:38			06:44			06:01	
	17:05	17:44		19:19			19:54			20:26	26
12	07:46	07:19		07:36			06:43			06:00	
	17:06	17:45		19:20			19:55			20:28	26
13	07:46	07:18		07:34			06:41			05:59	
	17:07	17:46		19:21			19:56			20:29	26
14	07:45	07:17		07:33			06:39			05:58	
	17:08	17:48		19:22			19:57			20:30	26
15	07:45	07:15		07:31			06:38			05:57	
	17:09	17:49		19:23			19:59			20:31	24
16	07:44	07:14		07:29			06:36			05:56	
	17:11	17:50		19:24			20:00			20:32	24
17	07:44	07:12		07:27			06:35			05:55	
	17:12	17:52	8	07:46 (41)	19:26		20:00			20:33	22
18	07:43	07:11		07:35 (41)	07:26		06:33			05:54	
	17:13	17:53	13	07:48 (41)	19:27		20:01			20:34	21
19	07:43	07:10		07:33 (41)	07:24		06:31			05:53	
	17:14	17:54	18	07:51 (41)	19:28		20:02			20:35	19
20	07:42	07:08		07:31 (41)	07:22		06:30			05:52	
	17:15	17:55	20	07:51 (41)	19:29		20:03			20:36	17
21	07:41	07:07		07:31 (41)	07:20		06:28			05:51	
	17:17	17:57	22	07:53 (41)	19:30		20:04			20:37	15
22	07:41	07:05		07:30 (41)	07:19		06:27			05:50	
	17:18	17:58	23	07:53 (41)	19:31	8	07:52 (43)			20:38	12
23	07:40	07:04		07:30 (41)	07:17		06:25			05:49	
	17:19	17:59	24	07:54 (41)	19:32	15	07:55 (43)			20:39	8
24	07:39	07:02		07:29 (41)	07:15		06:24			05:49	
	17:20	18:00	25	07:54 (41)	19:34	18	07:57 (43)			20:40	
25	07:39	07:01		07:28 (41)	07:14		06:22			05:48	
	17:22	18:02	25	07:53 (41)	19:35	21	07:58 (43)			20:41	
26	07:38	06:59		07:29 (41)	07:12		06:21			05:47	
	17:23	18:03	24	07:53 (41)	19:36	24	07:59 (43)			20:42	
27	07:37	06:57		07:28 (41)	07:10		06:19			05:46	
	17:24	18:04	25	07:53 (41)	19:37	25	07:59 (43)			20:42	
28	07:36	06:56		07:29 (41)	07:08		06:18			05:46	
	17:25	18:05	24	07:53 (41)	19:38	26	08:00 (43)			20:43	
29	07:35			07:07			06:16			06:39 (101)	
	17:27			19:39	27	08:00 (43)	20:13	7	06:46 (101)	20:44	
30	07:34			07:05			06:15			06:36 (101)	
	17:28			19:40	27	07:59 (43)	20:14	13	06:49 (101)	20:45	
31	07:33			07:03			06:14			05:44	
	17:29			19:42	26	07:58 (43)				20:46	
Potential sun hours	294	295		370			401			452	
Total, worst case											
Sun reduction		0.38		0.46			0.51			0.56	
Oper. time red.		1.00		1.00			1.00			1.00	
Wind dir. red.		0.59		0.61			0.62			0.66	
Total reduction		0.22		0.28			0.32			0.37	
Total, real		56		82			53			185	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

2015-08-31_Arkwright Summit_SFA

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Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 148 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1344)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

July	August	September	October	November	December
1 05:44	06:09	06:39 (101) 06:42	07:14	06:50	07:27
2 05:44	06:09	06:39 (101) 06:43	07:15	06:51	07:28
3 05:45	06:11	06:39 (101) 06:44	07:16	06:53	07:29
4 05:45	06:12	06:39 (101) 06:45	07:17	06:54	07:30
5 05:46	06:13	06:39 (101) 06:46	07:34 (43) 07:18	06:55	07:31
6 05:47	06:14	06:39 (101) 06:47	07:31 (43) 07:19	06:56	07:32
7 05:47	06:15	06:40 (101) 06:48	07:29 (43) 07:20	06:58	07:33
8 05:48	06:16	06:40 (101) 06:49	07:28 (43) 07:22	06:59	07:34
9 05:49	06:17	06:41 (101) 06:50	07:26 (43) 07:23	08:09 (41) 07:00	07:35
10 05:49	06:18	06:41 (101) 06:51	07:25 (43) 07:24	08:19 (41) 07:02	07:36
11 05:50	06:20	06:42 (101) 06:52	07:24 (43) 07:25	08:06 (41) 07:01	07:35
12 05:51	06:21	06:44 (101) 06:53	07:23 (43) 07:26	08:22 (41) 07:03	07:36
13 05:52	06:22	06:45 (101) 06:55	07:22 (43) 07:27	08:23 (41) 07:00	07:37
14 05:52	06:23	06:46 (101) 06:56	07:21 (43) 07:28	08:04 (41) 07:04	07:37
15 05:53	06:24	06:47 (101) 06:57	07:20 (43) 07:29	08:25 (41) 06:59	07:38
16 05:54	06:25	06:48 (101) 06:58	07:19 (43) 07:30	08:01 (41) 07:08	07:39
17 05:55	06:26	06:49 (101) 06:59	07:18 (43) 07:31	08:25 (41) 06:57	07:40
18 05:56	06:27	06:50 (101) 07:00	07:17 (43) 07:32	08:00 (41) 07:09	07:41
19 05:57	06:28	06:51 (101) 07:01	07:16 (43) 07:33	08:25 (41) 06:56	07:42
20 05:58	06:49 (101) 06:29	06:52 (101) 07:02	07:15 (43) 07:34	08:01 (41) 07:10	07:41
21 05:58	06:54 (101) 06:30	06:53 (101) 07:03	07:14 (43) 07:35	08:25 (41) 06:55	07:42
22 05:59	06:59 (101) 06:31	06:54 (101) 07:04	07:13 (43) 07:36	08:00 (41) 07:11	07:42
23 06:00	07:00 (101) 06:32	06:55 (101) 07:05	07:12 (43) 07:37	08:25 (41) 06:54	07:43
24 06:01	07:01 (101) 06:33	06:56 (101) 07:06	07:11 (43) 07:38	08:02 (41) 07:16	07:44
25 06:02	07:02 (101) 06:34	06:57 (101) 07:07	07:10 (43) 07:39	08:25 (41) 06:53	07:45
26 06:03	07:03 (101) 06:35	06:58 (101) 07:08	07:09 (43) 07:40	08:04 (41) 07:17	07:46
27 06:04	07:04 (101) 06:36	06:59 (101) 07:09	07:08 (43) 07:41	08:25 (41) 06:52	07:47
28 06:05	07:05 (101) 06:37	07:00 (101) 07:10	07:07 (43) 07:42	08:00 (41) 07:18	07:48
29 06:06	07:06 (101) 06:38	07:01 (101) 07:11	07:06 (43) 07:43	08:25 (41) 06:51	07:49
30 06:07	07:07 (101) 06:39	07:02 (101) 07:12	07:05 (43) 07:44	08:01 (41) 07:19	07:50
31 06:08	07:08 (101) 06:40	07:03 (101) 07:13	07:04 (43) 07:45	08:25 (41) 06:50	07:51
Potential sun hours 464	431	375	343	294	283
Total, worst case	227	304	372	334	
Sun reduction	0.67	0.64	0.57	0.50	
Oper. time red.	1.00	1.00	1.00	1.00	
Wind dir. red.	0.66	0.66	0.62	0.59	
Total reduction	0.44	0.42	0.35	0.29	
Total, real	100	128	130	97	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

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Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 149 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1345)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June
1	07:47	07:32	06:54	07:01	06:14	06:47 (101)
	16:55	17:31	18:07	19:43	20:15	25 07:12 (101)
2	07:47	07:31	06:53	07:00	06:12	06:47 (101)
	16:56	17:32	18:08	19:44	20:17	23 07:10 (101)
3	07:47	07:30	06:51	06:58	06:11	06:48 (101)
	16:57	17:33	18:09	19:45	20:18	21 07:09 (101)
4	07:47	07:29	06:49	06:56	06:10	06:50 (101)
	16:58	17:35	18:10	19:46	20:19	18 07:08 (101)
5	07:47	07:28	07:52 (41)	06:48	06:54	06:51 (101)
	16:59	17:36	18:03 (41)	18:11	19:47	16 07:07 (101)
6	07:47	07:27	07:50 (41)	06:46	06:53	06:52 (101)
	17:00	17:37	18:05 (41)	18:13	19:48	12 07:04 (101)
7	07:47	07:25	07:49 (41)	06:44	06:51	06:56 (101)
	17:01	17:39	18:07 (41)	18:14	19:49	5 07:01 (101)
8	07:47	07:24	07:48 (41)	07:43	06:49	06:05
	17:02	17:40	18:08 (41)	19:15	19:51	20:23
9	07:47	07:23	07:48 (41)	07:41	06:48	06:03
	17:03	17:41	18:09 (41)	19:16	19:52	20:24
10	07:47	07:22	07:46 (41)	07:39	08:05 (43)	06:02
	17:04	17:42	18:09 (41)	19:17	9 08:14 (43)	20:25
11	07:46	07:21	07:46 (41)	07:38	08:01 (43)	06:01
	17:05	17:44	18:10 (41)	19:19	16 08:17 (43)	20:26
12	07:46	07:19	07:46 (41)	07:36	08:00 (43)	06:00
	17:06	17:45	18:11 (41)	19:20	19 08:19 (43)	20:28
13	07:46	07:18	07:46 (41)	07:34	07:58 (43)	06:01
	17:07	17:46	18:10 (41)	19:21	22 08:20 (43)	20:29
14	07:45	07:17	07:46 (41)	07:33	07:56 (43)	06:39
	17:08	17:48	18:11 (41)	19:22	24 08:20 (43)	19:57
15	07:45	07:15	07:46 (41)	07:31	07:55 (43)	06:38
	17:09	17:49	18:10 (41)	19:23	26 08:21 (43)	19:59
16	07:44	07:14	07:46 (41)	07:29	07:55 (43)	06:36
	17:11	17:50	18:10 (41)	19:24	26 08:21 (43)	20:00
17	07:44	07:12	07:47 (41)	07:27	07:54 (43)	06:35
	17:12	17:52	18:10 (41)	19:26	27 08:21 (43)	20:00
18	07:43	07:11	07:47 (41)	07:26	07:54 (43)	06:33
	17:13	17:53	18:08 (41)	19:27	27 08:21 (43)	20:01
19	07:43	07:10	07:49 (41)	07:24	07:53 (43)	06:31
	17:14	17:54	18:08 (41)	19:28	27 08:20 (43)	20:02
20	07:42	07:08	07:50 (41)	07:22	07:54 (43)	06:30
	17:15	17:55	18:06 (41)	19:29	26 08:20 (43)	20:03
21	07:41	07:07	07:52 (41)	07:20	07:54 (43)	06:28
	17:17	17:57	18:04 (41)	19:30	25 08:19 (43)	20:04
22	07:41	07:05	07:56 (41)	07:19	07:54 (43)	06:27
	17:18	17:58	3 07:59 (41)	19:31	24 08:18 (43)	20:05
23	07:40	07:04		07:17	07:54 (43)	06:25
	17:19	17:59		19:32	22 08:16 (43)	20:06
24	07:39	07:02		07:15	07:56 (43)	06:24
	17:20	18:00		19:34	20 08:16 (43)	20:08
25	07:39	07:01		07:14	07:57 (43)	06:22
	17:22	18:02		19:35	16 08:13 (43)	20:09
26	07:38	06:59		07:12	07:59 (43)	06:21
	17:23	18:03		19:36	11 08:10 (43)	20:10
27	07:37	06:57		07:10	06:19	06:46 (101)
	17:24	18:04		19:37	20:11	28 07:14 (101)
28	07:36	06:56		07:08	06:18	06:47 (101)
	17:25	18:05		19:38	20:12	27 07:14 (101)
29	07:35			07:07	06:16	06:46 (101)
	17:27			19:39	20:13	26 07:12 (101)
30	07:34			07:05	06:15	06:47 (101)
	17:28			19:40	20:14	25 07:12 (101)
31	07:33			07:03		05:44
	17:29			19:42		20:46
Potential sun hours	294	295	370	401	452	457
Total, worst case		348	367	330	120	
Sun reduction		0.38	0.46	0.51	0.56	
Oper. time red.		1.00	1.00	1.00	1.00	
Wind dir. red.		0.58	0.60	0.64	0.64	
Total reduction		0.22	0.27	0.33	0.36	
Total, real		77	101	107	43	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

2015-08-31_Arkwright Summit_SFA

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Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 149 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1345)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

July		August		September		October		November		December	
1	05:44	06:09		06:42		07:14		07:38 (43)	06:50	07:16 (41)	07:27
	20:59	20:39		19:53		19:00		07:58 (43)	17:12	07:39 (41)	16:46
2	05:44	06:10		06:43		07:15		07:39 (43)	06:51	07:17 (41)	07:28
	20:59	20:38		19:51		18:59		07:56 (43)	17:10	07:38 (41)	16:46
3	05:45	06:11		06:44		07:16		07:41 (43)	06:53	07:18 (41)	07:29
	20:58	20:37		19:50		18:57		07:53 (43)	17:09	07:38 (41)	16:45
4	05:45	06:12		06:45		07:17			06:54	07:19 (41)	07:30
	20:58	20:36		19:48		18:55			17:08	07:36 (41)	16:45
5	05:46	06:13		06:46		07:18			06:55	07:20 (41)	07:31
	20:58	20:35		19:46		18:53			17:07	07:35 (41)	16:45
6	05:47	06:14		06:47		07:19			06:56	07:23 (41)	07:32
	20:58	20:33	8	07:05 (101)	19:44	18:52			17:06	07:33 (41)	16:45
7	05:47	06:15		07:02 (101)	19:43	18:50			06:58		07:33
	20:57	20:32	14	07:16 (101)	19:43	18:50			17:04		16:45
8	05:48	06:16		07:00 (101)	19:49	18:52			06:59		07:34
	20:57	20:31	17	07:17 (101)	19:41	18:48			17:03		16:45
9	05:49	06:17		06:59 (101)	19:50	18:47			07:00		07:35
	20:57	20:29	19	07:18 (101)	19:39	18:47			17:02		16:45
10	05:49	06:18		06:58 (101)	19:51	18:45			07:01		07:35
	20:56	20:28	21	07:19 (101)	19:37	18:45			17:01		16:45
11	05:50	06:20		06:57 (101)	19:52	18:43			07:03		07:36
	20:56	20:27	23	07:20 (101)	19:36	18:43			17:00		16:45
12	05:51	06:21		06:56 (101)	19:53	18:42			07:04		07:37
	20:55	20:25	25	07:21 (101)	19:34	18:42			16:59		16:45
13	05:52	06:22		06:55 (101)	19:54	18:40			07:05		07:38
	20:55	20:24	26	07:21 (101)	19:32	18:40			16:58		16:45
14	05:52	06:23		06:55 (101)	19:55	18:38			07:06		07:39
	20:54	20:23	26	07:21 (101)	19:30	18:38			16:57		16:45
15	05:53	06:24		06:54 (101)	19:56	18:37			07:08		07:39
	20:54	20:21	27	07:21 (101)	19:29	18:37			16:56		16:45
16	05:54	06:25		06:54 (101)	19:57	18:35			07:09		07:40
	20:53	20:20	27	07:21 (101)	19:27	18:35			16:55		16:46
17	05:55	06:26		06:54 (101)	19:58	18:32			07:10		07:41
	20:53	20:18	27	07:21 (101)	19:25	18:34			16:54		16:46
18	05:56	06:27		06:54 (101)	19:59	18:33			07:11		07:42
	20:52	20:17	27	07:21 (101)	19:23	18:32			16:54		16:46
19	05:57	06:28		06:54 (101)	19:01	18:34			07:13		07:42
	20:51	20:15	26	07:20 (101)	19:21	18:30			16:53		16:47
20	05:58	06:29		06:54 (101)	19:02	18:35		08:24 (41)	07:14		07:43
	20:50	20:14	26	07:20 (101)	19:20	18:29		08:32 (41)	16:52		16:47
21	05:58	06:30		06:54 (101)	19:03	18:37		08:22 (41)	07:15		07:43
	20:50	20:12	25	07:19 (101)	19:18	18:27		08:35 (41)	16:51		16:47
22	05:59	06:31		06:54 (101)	19:04	18:38		08:20 (41)	07:16		07:44
	20:49	20:11	24	07:18 (101)	19:16	18:26		08:37 (41)	16:51		16:48
23	06:00	06:32		06:55 (101)	19:05	18:39		08:18 (41)	07:17		07:44
	20:48	20:09	22	07:17 (101)	19:14	18:24		08:38 (41)	16:50		16:48
24	06:01	06:33		06:56 (101)	19:06	18:40		08:17 (41)	07:19		07:45
	20:47	20:08	19	07:15 (101)	19:13	18:23		08:38 (41)	16:49		16:49
25	06:02	06:34		06:58 (101)	19:07	18:42		08:17 (41)	07:20		07:45
	20:46	20:06	15	07:13 (101)	19:11	18:21		08:40 (41)	16:49		16:50
26	06:03	06:35		07:00 (101)	19:08	18:43		08:16 (41)	07:21		07:46
	20:45	20:04	10	07:10 (101)	19:09	18:20		08:40 (41)	16:48		16:50
27	06:04	06:37		07:09		18:44		08:15 (41)	07:22		07:46
	20:44	20:03		19:07		18:19		08:40 (41)	16:48		16:51
28	06:05	06:38		07:11		18:45		08:16 (41)	07:23		07:46
	20:43	20:01		19:06		18:17		08:40 (41)	16:47		16:52
29	06:06	06:39		07:12		18:46		08:15 (41)	07:24		07:46
	20:42	20:00		19:04		18:16		08:40 (41)	16:47		16:52
30	06:07	06:40		07:13		18:48		08:15 (41)	07:25		07:47
	20:41	19:56		19:02		18:14		08:40 (41)	16:46		16:53
31	06:08	06:41				18:49		08:16 (41)			07:47
	20:40	19:55				18:13		08:40 (41)			16:54
Potential sun hours	464	431		375		343		294			283
Total, worst case			454	321		298		106			
Sun reduction			0.64	0.57		0.50		0.29			
Oper. time red.			1.00	1.00		1.00		1.00			
Wind dir. red.			0.64	0.60		0.59		0.58			
Total reduction			0.41	0.34		0.29		0.17			
Total, real			186	109		87		18			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 77

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 150 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1346)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

January			February			March			April			May			June		
1	07:47	07:32	06:54						07:01			06:14			07:01 (43)	05:43	
	16:55	17:31	18:07						19:43			20:15			21 07:22 (43)	20:47	
2	07:47	07:31	06:53						07:00			06:12			07:01 (43)	05:43	
	16:56	17:32	18:08						19:44			20:17			19 07:20 (43)	20:48	
3	07:47	07:30	06:51						06:58			06:11			07:03 (43)	05:43	
	16:57	17:33	18:09						19:45			20:18			16 07:19 (43)	20:48	
4	07:47	07:29	06:49						06:56			06:10			07:05 (43)	05:42	
	16:58	17:35	18:10						19:46			20:19			12 07:17 (43)	20:49	
5	07:47	07:28	06:48						06:54			06:08			07:10 (43)	05:42	06:11 (101)
	16:59	17:36	18:11						19:47			20:20			2 07:12 (43)	20:50	6 06:17 (101)
6	07:47	07:27	06:46						06:53			06:07				05:41	06:10 (101)
	17:00	17:37	18:13						19:48			20:21				20:50	9 06:19 (101)
7	07:47	07:25	06:44					07:15 (41)	06:51			06:06				05:41	06:09 (101)
	17:01	17:39	18:14					9 07:24 (41)	19:49			20:22				20:51	11 06:20 (101)
8	07:47	07:24	07:43					08:11 (41)	06:49			06:05				05:41	06:07 (101)
	17:02	17:40	19:15					16 08:27 (41)	19:51			20:23				20:52	14 06:21 (101)
9	07:47	07:23	07:41					08:10 (41)	06:48			06:03				05:41	06:07 (101)
	17:03	17:41	19:16					19 08:29 (41)	19:52			20:24				20:52	15 06:22 (101)
10	07:46	07:22	07:39					08:08 (41)	06:46			06:02				05:40	06:07 (101)
	17:04	17:42	19:17					22 08:30 (41)	19:53			20:25				20:53	16 06:23 (101)
11	07:46	07:21	07:38					08:06 (41)	06:44			06:01				05:40	06:07 (101)
	17:05	17:44	19:19					25 08:31 (41)	19:54			20:26				20:54	16 06:23 (101)
12	07:46	07:19	07:36					08:06 (41)	06:43			06:00				05:40	06:07 (101)
	17:06	17:45	19:20					26 08:32 (41)	19:55			20:28				20:54	17 06:24 (101)
13	07:46	07:18	07:34					08:05 (41)	06:41			05:59				05:40	06:07 (101)
	17:07	17:46	19:21					27 08:32 (41)	19:56			20:29				20:55	18 06:25 (101)
14	07:45	07:17	07:33					08:04 (41)	06:39			07:09 (43)	05:58			05:40	06:07 (101)
	17:08	17:48	19:22					28 08:32 (41)	19:57	13	07:22 (43)	20:30				20:55	18 06:25 (101)
15	07:45	07:15	07:31					08:03 (41)	06:38			07:06 (43)	05:57			05:40	06:07 (101)
	17:09	17:49	19:23					28 08:31 (41)	19:59	17	07:23 (43)	20:31				20:56	19 06:26 (101)
16	07:44	07:14	07:29					08:04 (41)	06:36			07:04 (43)	05:56			05:40	06:07 (101)
	17:11	17:50	19:24					28 08:32 (41)	20:00	21	07:25 (43)	20:32				20:56	19 06:26 (101)
17	07:44	07:12	07:27					08:04 (41)	06:35			07:03 (43)	05:55			05:40	06:07 (101)
	17:12	17:52	19:26					27 08:31 (41)	20:00	23	07:26 (43)	20:33				20:56	19 06:26 (101)
18	07:43	07:11	07:26					08:03 (41)	06:33			07:02 (43)	05:54			05:40	06:07 (101)
	17:13	17:53	19:27					27 08:30 (41)	20:01	25	07:27 (43)	20:34				20:57	20 06:27 (101)
19	07:43	07:10	07:24					08:03 (41)	06:31			07:00 (43)	05:53			05:40	06:07 (101)
	17:14	17:54	19:28					26 08:29 (41)	20:02	27	07:27 (43)	20:35				20:57	20 06:27 (101)
20	07:42	07:08	07:22					08:05 (41)	06:30			06:59 (43)	05:52			05:40	06:07 (101)
	17:15	17:55	19:29					23 08:28 (41)	20:03	28	07:27 (43)	20:36				20:58	20 06:27 (101)
21	07:41	07:07	07:20					08:05 (41)	06:28			06:59 (43)	05:51			05:40	06:07 (101)
	17:17	17:57	19:30					21 08:26 (41)	20:04	29	07:28 (43)	20:37				20:58	20 06:27 (101)
22	07:41	07:05	07:19					08:06 (41)	06:27			06:58 (43)	05:50			05:41	06:08 (101)
	17:18	17:58	19:31					18 08:24 (41)	20:05	29	07:27 (43)	20:38				20:58	20 06:28 (101)
23	07:40	07:04	07:17					08:08 (41)	06:25			06:58 (43)	05:49			05:41	06:08 (101)
	17:19	17:59	19:32					13 08:21 (41)	20:06	30	07:28 (43)	20:39				20:58	20 06:28 (101)
24	07:39	07:02	07:15					08:13 (41)	06:24			06:58 (43)	05:49			05:41	06:08 (101)
	17:20	18:00	19:34					4 08:17 (41)	20:08	30	07:28 (43)	20:40				20:58	20 06:28 (101)
25	07:39	07:01	07:14						06:22			06:58 (43)	05:48			05:41	06:09 (101)
	17:22	18:02	19:35						20:09	29	07:27 (43)	20:41				20:59	19 06:28 (101)
26	07:38	06:59	07:12						06:21			06:58 (43)	05:47			05:42	06:09 (101)
	17:23	18:03	19:36						20:10	29	07:27 (43)	20:42				20:59	19 06:28 (101)
27	07:37	06:57	07:10						06:19			06:58 (43)	05:46			05:42	06:09 (101)
	17:24	18:04	19:37						20:11	28	07:26 (43)	20:42				20:59	19 06:28 (101)
28	07:36	06:56	07:08						06:18			06:59 (43)	05:46			05:43	06:10 (101)
	17:25	18:05	19:38						20:12	26	07:25 (43)	20:43				20:59	18 06:28 (101)
29	07:35		07:07						06:16			06:58 (43)	05:45			05:43	06:10 (101)
	17:27		19:39						20:13	26	07:24 (43)	20:44				20:59	18 06:28 (101)
30	07:34		07:05						06:15			06:59 (43)	05:45			05:43	06:11 (101)
	17:28		19:40						20:14	24	07:23 (43)	20:45				20:59	17 06:28 (101)
31	07:33		07:03									05:44					
	17:29		19:42									20:46					
Potential sun hours	294	295	370					401				452			457		
Total, worst case				387				434				70			447		
Sun reduction				0.46				0.51				0.56			0.65		
Oper. time red.				1.00				1.00				1.00			1.00		
Wind dir. red.				0.59				0.63				0.63			0.69		
Total reduction				0.27				0.32				0.35			0.44		
Total, real				104				139				25			198		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 78

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 150 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1346)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

July		August		September		October		November		December	
1	05:44	06:11 (101)	06:09		06:42		07:14		07:44 (41)	06:50	07:27
	20:59	17 06:28 (101)	20:39		19:53		19:00	27	08:11 (41)	17:12	16:46
2	05:44	06:12 (101)	06:10		06:43		07:15		07:45 (41)	06:51	07:28
	20:59	16 06:28 (101)	20:38		19:51		18:59	25	08:10 (41)	17:10	16:46
3	05:45	06:12 (101)	06:11		06:44		07:16		07:45 (41)	06:53	07:29
	20:58	15 06:27 (101)	20:37		19:50		18:57	23	08:08 (41)	17:09	16:45
4	05:45	06:13 (101)	06:12		06:45		07:17		07:46 (41)	06:54	07:30
	20:58	14 06:27 (101)	20:36		19:48		18:55	21	08:07 (41)	17:08	16:45
5	05:46	06:14 (101)	06:13		06:46		07:18		07:48 (41)	06:55	07:31
	20:58	12 06:26 (101)	20:35		19:46		18:53	18	08:06 (41)	17:07	16:45
6	05:47	06:15 (101)	06:14		06:47		07:19		07:50 (41)	06:56	07:32
	20:58	11 06:26 (101)	20:33		19:44		18:52	13	08:03 (41)	17:06	16:45
7	05:47	06:16 (101)	06:15		06:48		07:20		07:55 (41)	06:58	07:33
	20:57	8 06:24 (101)	20:32		19:43		18:50	2	07:57 (41)	17:04	16:45
8	05:48	06:19 (101)	06:16		07:17 (43)	06:49	07:22			06:59	07:34
	20:57	3 06:22 (101)	20:31	7	07:24 (43)	19:41	18:48			17:03	16:45
9	05:49		06:17		07:14 (43)	06:50	07:23			07:00	07:35
	20:57		20:29	13	07:27 (43)	19:39	18:47			17:02	16:45
10	05:49		06:18		07:12 (43)	06:51	07:24			07:01	07:35
	20:56		20:28	17	07:29 (43)	19:37	18:45			17:01	16:45
11	05:50		06:20		07:10 (43)	06:52	07:25			07:03	07:36
	20:56		20:27	20	07:30 (43)	19:36	18:43			17:00	16:45
12	05:51		06:21		07:09 (43)	06:53	07:26			07:04	07:37
	20:55		20:25	22	07:31 (43)	19:34	18:42			16:59	16:45
13	05:52		06:22		07:08 (43)	06:55	07:27			07:05	07:38
	20:55		20:24	24	07:32 (43)	19:32	18:40			16:58	16:45
14	05:52		06:23		07:07 (43)	06:56	07:28			07:06	07:39
	20:54		20:23	26	07:33 (43)	19:30	18:38			16:57	16:45
15	05:53		06:24		07:06 (43)	06:57	07:30			07:08	07:39
	20:54		20:21	27	07:33 (43)	19:29	18:37			16:56	16:45
16	05:54		06:25		07:05 (43)	06:58	07:31			07:09	07:40
	20:53		20:20	29	07:34 (43)	19:27	18:35			16:55	16:46
17	05:55		06:26		07:05 (43)	06:59	07:32			07:10	07:41
	20:53		20:18	29	07:34 (43)	19:25	18:34			16:54	16:46
18	05:56		06:27		07:04 (43)	07:00	07:33			07:11	07:42
	20:52		20:17	30	07:34 (43)	19:23	18:32			16:54	16:46
19	05:57		06:28		07:04 (43)	07:01	07:34			07:13	07:42
	20:51		20:15	30	07:34 (43)	19:21	18:30			16:53	16:47
20	05:58		06:29		07:04 (43)	07:02	07:35			07:14	07:43
	20:50		20:14	29	07:33 (43)	19:20	18:29			16:52	16:47
21	05:58		06:30		07:04 (43)	07:03	07:37			07:15	07:43
	20:50		20:12	29	07:33 (43)	19:18	18:27			16:51	16:47
22	05:59		06:31		07:04 (43)	07:04	07:38			07:16	07:44
	20:49		20:11	29	07:33 (43)	19:16	18:26			16:51	16:48
23	06:00		06:32		07:04 (43)	07:05	07:48 (41)			07:17	07:44
	20:48		20:09	28	07:32 (43)	19:14	18:24			16:50	16:48
24	06:01		06:33		07:04 (43)	07:06	07:47 (41)			07:19	07:45
	20:47		20:08	27	07:31 (43)	19:13	18:23			16:49	16:49
25	06:02		06:34		07:05 (43)	07:07	07:47 (41)			07:20	07:45
	20:46		20:06	25	07:30 (43)	19:11	18:21			16:49	16:50
26	06:03		06:35		07:05 (43)	07:08	07:46 (41)			07:21	07:46
	20:45		20:04	24	07:29 (43)	19:09	18:20			16:48	16:50
27	06:04		06:37		07:06 (43)	07:09	07:45 (41)			07:22	07:46
	20:44		20:03	21	07:27 (43)	19:07	18:19			16:48	16:51
28	06:05		06:38		07:08 (43)	07:11	07:45 (41)			07:23	07:46
	20:43		20:01	17	07:25 (43)	19:06	18:17			16:47	16:52
29	06:06		06:39		07:10 (43)	07:12	07:45 (41)			07:24	07:46
	20:42		20:00	12	07:22 (43)	19:04	18:16			16:47	16:52
30	06:07		06:40		07:13		07:44 (41)			07:25	07:47
	20:41		19:56		19:02		08:12 (41)			16:46	16:53
31	06:08		06:41				07:49				07:47
	20:40		19:55				18:13				16:54
Potential sun hours	464		431		375		343		294		283
Total, worst case		96		515		261		129			
Sun reduction		0.67		0.64		0.57		0.50			
Oper. time red.		1.00		1.00		1.00		1.00			
Wind dir. red.		0.69		0.63		0.59		0.59			
Total reduction		0.46		0.40		0.33		0.29			
Total, real		44		207		87		38			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
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Project:

2015-08-31_Arkwright Summit_SFA

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Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 151 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1347)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	January		February		March		April		May		June	
1	07:47	07:32			06:54		07:39 (41)	07:01		07:31 (43)	06:14	05:43
	16:55	17:31			18:07	22	08:01 (41)	19:43	32	08:03 (43)	20:15	20:47
2	07:47	07:31			06:53		07:39 (41)	07:00		07:31 (43)	06:12	05:43
	16:56	17:32			18:08	19	07:58 (41)	19:44	31	08:02 (43)	20:17	20:48
3	07:47	07:30			06:51		07:42 (41)	06:58		07:30 (43)	06:11	05:43
	16:57	17:33			18:09	15	07:57 (41)	19:45	32	08:02 (43)	20:18	20:48
4	07:47	07:29			06:49		07:45 (41)	06:56		07:30 (43)	06:10	05:42
	16:58	17:35			18:10	8	07:53 (41)	19:46	31	08:01 (43)	20:19	20:49
5	07:47	07:28			06:48			06:54		07:30 (43)	06:08	05:42
	16:59	17:36			18:11			19:47	31	08:01 (43)	20:20	20:50
6	07:47	07:27			06:46			06:53		07:30 (43)	06:07	05:41
	17:00	17:37			18:13			19:48	30	08:00 (43)	20:21	20:50
7	07:47	07:25			06:44			06:51		07:30 (43)	06:06	05:41
	17:01	17:39			18:14			19:49	29	07:59 (43)	20:22	20:51
8	07:47	07:24			07:43			06:49		07:31 (43)	06:05	05:41
	17:02	17:40			19:15			19:51	27	07:58 (43)	20:23	20:52
9	07:47	07:23			07:41			06:48		07:31 (43)	06:03	05:41
	17:03	17:41			19:16			19:52	26	07:57 (43)	20:24	20:52
10	07:46	07:22			07:39			06:46		07:32 (43)	06:02	05:40
	17:04	17:42			19:17			19:53	23	07:55 (43)	20:25	20:53
11	07:46	07:21			07:38			06:44		07:34 (43)	06:01	05:40
	17:05	17:44			19:19			19:54	20	07:54 (43)	20:26	20:54
12	07:46	07:19			07:36			06:43		07:36 (43)	06:00	05:40
	17:06	17:45			19:20			19:55	15	07:51 (43)	20:28	20:54
13	07:46	07:18		07:48 (41)	07:34			06:41		07:39 (43)	05:59	05:40
	17:07	17:46	6		19:21			19:56	7	07:46 (43)	20:29	20:55
14	07:45	07:17		07:44 (41)	07:33			06:39			05:58	05:40
	17:08	17:48	14		19:22			19:57			20:30	20:55
15	07:45	07:15		07:42 (41)	07:31			06:38			05:57	05:40
	17:09	17:49	18		19:23			19:59			20:31	20:56
16	07:44	07:14		07:41 (41)	07:29			06:36			05:56	05:40
	17:11	17:50	21		19:24			20:00			20:32	20:56
17	07:44	07:12		07:40 (41)	07:27			06:35			05:55	05:40
	17:12	17:52	23		19:26			20:00			20:33	20:56
18	07:43	07:11		07:38 (41)	07:26			06:33			05:54	05:40
	17:13	17:53	26		19:27			20:01			20:34	20:57
19	07:43	07:10		07:38 (41)	07:24			06:31			05:53	05:40
	17:14	17:54	27		19:28			20:02			20:35	20:57
20	07:42	07:08		07:37 (41)	07:22			06:30			05:52	05:40
	17:15	17:55	28		19:29			20:03			20:36	20:58
21	07:41	07:07		07:37 (41)	07:20			06:28			05:51	05:40
	17:17	17:57	28		19:30			20:04			20:37	20:58
22	07:41	07:05		07:36 (41)	07:19			06:27			05:50	05:41
	17:18	17:58	29		19:31			20:05			20:38	20:58
23	07:40	07:04		07:36 (41)	07:17			06:25			05:49	05:41
	17:19	17:59	29		19:32			20:06			20:39	20:58
24	07:39	07:02		07:36 (41)	07:15		07:45 (43)	06:24			05:49	05:41
	17:20	18:00	29		19:34	10	07:55 (43)	20:08			20:40	20:58
25	07:39	07:01		07:36 (41)	07:14		07:41 (43)	06:22			05:48	05:41
	17:22	18:02	28		19:35	17	07:58 (43)	20:09			20:41	20:59
26	07:38	06:59		07:37 (41)	07:12		07:38 (43)	06:21			05:47	05:42
	17:23	18:03	27		19:36	21	07:59 (43)	20:10			20:42	20:59
27	07:37	06:57		07:37 (41)	07:10		07:36 (43)	06:19			05:46	05:42
	17:24	18:04	26		19:37	24	08:00 (43)	20:11			20:42	20:59
28	07:36	06:56		07:38 (41)	07:08		07:35 (43)	06:18			05:46	05:42
	17:25	18:05	24		19:38	27	08:02 (43)	20:12			20:43	20:59
29	07:35				07:07		07:34 (43)	06:16			05:45	05:43
	17:27				19:39	28	08:02 (43)	20:13			20:44	20:59
30	07:34				07:05		07:33 (43)	06:15			05:45	05:43
	17:28				19:40	29	08:02 (43)	20:14			20:45	20:59
31	07:33				07:03		07:31 (43)				05:44	05:41
	17:29				19:42	31	08:02 (43)				20:46	20:59
Potential sun hours	294	295			370			401			452	457
Total, worst case			383		251			334			612	766
Sun reduction			0.38		0.46			0.51			0.56	0.65
Oper. time red.			1.00		1.00			1.00			1.00	1.00
Wind dir. red.			0.59		0.61			0.62			0.67	0.67
Total reduction			0.22		0.28			0.31			0.38	0.44
Total, real			85		70			105			230	333

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker		(WTG causing flicker first time)	
	Sun set (hh:mm)		Last time (hh:mm) with flicker		(WTG causing flicker last time)	
	Minutes with flicker					

Project:

2015-08-31_Arkwright Summit_SFA

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Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 151 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1347)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

July		August		September		October		November		December	
1	05:44	06:28 (101)	06:09	06:35 (101)	06:42	07:33 (43)	07:14	06:50	07:27		
2	05:44	06:53 (101)	25 20:39	19 06:54 (101)	19:53	20 07:53 (43)	19:00	17:12	16:46		
3	05:45	06:28 (101)	06:10	06:37 (101)	06:43	07:31 (43)	07:15	06:51	07:28		
4	05:45	06:54 (101)	26 20:38	15 06:52 (101)	19:51	23 07:54 (43)	18:59	17:10	16:46		
5	05:45	06:28 (101)	06:11	06:39 (101)	06:44	07:29 (43)	07:16	06:53	07:29		
6	05:47	06:54 (101)	26 20:37	11 06:50 (101)	19:49	26 07:55 (43)	18:57	17:09	16:45		
7	05:47	06:28 (101)	06:12		06:45	07:28 (43)	07:17	06:54	07:30		
8	05:47	06:55 (101)	27 20:36		19:48	27 07:55 (43)	18:55	17:08	16:45		
9	05:46	06:28 (101)	06:13		06:46	07:27 (43)	07:18	06:55	07:31		
10	05:47	06:55 (101)	27 20:35		19:46	29 07:56 (43)	18:53	17:07	16:45		
11	05:47	06:28 (101)	06:14		06:47	07:26 (43)	07:19	06:56	07:32		
12	05:47	06:56 (101)	28 20:33		19:44	30 07:56 (43)	18:52	17:06	16:45		
13	05:47	06:27 (101)	06:15		06:48	07:25 (43)	07:20	06:58	07:33		
14	05:48	06:56 (101)	29 20:32		19:43	31 07:56 (43)	18:50	17:04	16:45		
15	05:48	06:28 (101)	06:16		06:49	07:25 (43)	07:22	06:59	07:34		
16	05:49	06:56 (101)	28 20:31		19:41	31 07:56 (43)	18:48	17:03	16:45		
17	05:49	06:28 (101)	06:17		06:50	07:24 (43)	07:23	07:00	07:35		
18	05:49	06:57 (101)	29 20:29		19:39	32 07:56 (43)	18:47	17:02	16:45		
19	05:49	06:27 (101)	06:18		06:51	07:24 (43)	07:24	08:17 (41)	07:01	07:35	
20	05:50	06:57 (101)	30 20:28		19:37	32 07:56 (43)	18:45	12 08:29 (41)	17:01	16:45	
21	05:50	06:28 (101)	06:20		06:52	07:24 (43)	07:25	08:14 (41)	07:03	07:36	
22	05:51	06:57 (101)	29 20:27		19:36	31 07:55 (43)	18:43	17 08:31 (41)	17:00	16:45	
23	05:51	06:28 (101)	06:21		06:53	07:24 (43)	07:26	08:13 (41)	07:04	07:37	
24	05:52	06:58 (101)	30 20:25		19:34	30 07:54 (43)	18:42	20 08:33 (41)	16:59	16:45	
25	05:52	06:28 (101)	06:22		06:55	07:24 (43)	07:27	08:11 (41)	07:05	07:38	
26	05:52	06:59 (101)	31 20:24		19:32	30 07:54 (43)	18:40	23 08:34 (41)	16:58	16:45	
27	05:53	06:27 (101)	06:23		06:56	07:24 (43)	07:28	08:10 (41)	07:06	07:39	
28	05:53	06:58 (101)	31 20:23		19:30	29 07:53 (43)	18:38	25 08:35 (41)	16:57	16:45	
29	05:53	06:27 (101)	06:24		06:57	07:24 (43)	07:30	08:09 (41)	07:08	07:39	
30	05:54	06:59 (101)	32 20:21		19:29	27 07:51 (43)	18:37	26 08:35 (41)	16:56	16:45	
31	05:54	06:28 (101)	06:25		06:58	07:25 (43)	07:31	08:08 (41)	07:09	07:40	
32	05:54	06:59 (101)	31 20:20		19:27	25 07:50 (43)	18:35	28 08:36 (41)	16:55	16:46	
33	05:55	06:28 (101)	06:26		06:59	07:26 (43)	07:32	08:08 (41)	07:10	07:41	
34	05:55	06:59 (101)	31 20:18		19:25	22 07:48 (43)	18:34	29 08:37 (41)	16:54	16:46	
35	05:56	06:28 (101)	06:27		07:00	07:28 (43)	07:33	08:07 (41)	07:11	07:42	
36	05:56	07:00 (101)	32 20:17		19:23	17 07:45 (43)	18:32	29 08:36 (41)	16:54	16:46	
37	05:57	06:28 (101)	06:28		07:01	07:30 (43)	07:34	08:07 (41)	07:13	07:42	
38	05:57	07:00 (101)	32 20:15		19:21	12 07:42 (43)	18:30	29 08:36 (41)	16:53	16:47	
39	05:58	06:28 (101)	06:29		07:02		07:35	08:07 (41)	07:14	07:43	
40	05:58	06:59 (101)	31 20:14		19:20		18:29	29 08:36 (41)	16:52	16:47	
41	05:58	06:28 (101)	06:30		07:03		07:37	08:08 (41)	07:15	07:43	
42	05:59	06:59 (101)	31 20:12		19:18		18:27	28 08:36 (41)	16:51	16:47	
43	05:59	06:28 (101)	06:31		07:04		07:38	08:08 (41)	07:16	07:44	
44	05:59	06:59 (101)	31 20:11		19:16		18:26	27 08:35 (41)	16:51	16:48	
45	06:00	06:29 (101)	06:32		07:05		07:39	08:08 (41)	07:17	07:44	
46	06:00	06:59 (101)	30 20:09		19:14		18:24	26 08:34 (41)	16:50	16:48	
47	06:01	06:29 (101)	06:33		07:06		07:40	08:08 (41)	07:19	07:45	
48	06:01	06:59 (101)	30 20:08		19:13		18:23	25 08:33 (41)	16:49	16:49	
49	06:02	06:30 (101)	06:34		07:07		07:41	08:10 (41)	07:20	07:45	
50	06:02	06:59 (101)	29 20:06		19:11		18:21	23 08:33 (41)	16:49	16:50	
51	06:03	06:30 (101)	06:35		07:08		07:43	08:11 (41)	07:21	07:46	
52	06:03	06:59 (101)	29 20:04		19:09		18:20	20 08:31 (41)	16:48	16:50	
53	06:04	06:31 (101)	06:37		07:09		07:44	08:12 (41)	07:22	07:46	
54	06:04	06:58 (101)	27 20:03		19:07		18:19	17 08:29 (41)	16:48	16:51	
55	06:05	06:31 (101)	06:38		07:11		07:45	08:15 (41)	07:23	07:46	
56	06:05	06:58 (101)	27 20:01		19:06		18:17	12 08:27 (41)	16:47	16:52	
57	06:06	06:32 (101)	06:39		07:12		07:46	08:19 (41)	07:24	07:46	
58	06:06	06:57 (101)	25 20:00		19:04		18:16	3 08:22 (41)	16:47	16:52	
59	06:07	06:33 (101)	06:40		07:13		07:48		07:25	07:47	
60	06:07	06:56 (101)	23 19:56	8 07:47 (43)	19:02		18:14		16:46	16:53	
61	06:08	06:34 (101)	06:41		07:35 (43)		07:49			07:47	
62	06:08	06:55 (101)	21 19:55	16 07:51 (43)			18:13			16:54	
63	Potential sun hours	464	431		375		343		294	283	
64	Total, worst case	888		69	504		448				
65	Sun reduction	0.67		0.64	0.57		0.50				
66	Oper. time red.	1.00		1.00	1.00		1.00				
67	Wind dir. red.	0.67		0.66	0.62		0.59				
68	Total reduction	0.45		0.42	0.35		0.29				
69	Total, real	398		29	177		130				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

2015-08-31_Arkwright Summit_SFA

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Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 152 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1348)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	[January]		[February]		[March]		[April]		[May]		[June]		
1	07:47		07:32		08:01 (41)	06:54		07:01		06:14		06:48 (101)	05:43
	16:55		17:31	26	08:27 (41)	18:07		19:43		20:15	31	07:19 (101)	20:47
2	07:47		07:31		08:01 (41)	06:53		07:00		06:12		06:48 (101)	05:43
	16:56		17:32	27	08:28 (41)	18:08		19:44		20:17	29	07:17 (101)	20:48
3	07:47		07:30		08:01 (41)	06:51		06:58		06:11		06:49 (101)	05:43
	16:57		17:33	27	08:28 (41)	18:09		19:45		20:18	28	07:17 (101)	20:48
4	07:47		07:29		08:01 (41)	06:49		07:17 (43)	06:56	06:10		06:49 (101)	05:42
	16:58		17:35	28	08:29 (41)	18:10	12	07:29 (43)	19:46	20:19	27	07:16 (101)	20:49
5	07:47		07:28		08:00 (41)	06:48		07:14 (43)	06:54	06:08		06:50 (101)	05:42
	16:59		17:36	28	08:28 (41)	18:11	18	07:32 (43)	19:47	20:20	25	07:15 (101)	20:50
6	07:47		07:27		08:01 (41)	06:46		07:12 (43)	06:53	06:07		06:50 (101)	05:41
	17:00		17:37	27	08:28 (41)	18:13	22	07:34 (43)	19:48	20:21	24	07:14 (101)	20:50
7	07:47		07:25		08:01 (41)	06:44		07:10 (43)	06:51	06:06		06:52 (101)	05:41
	17:01		17:39	27	08:28 (41)	18:14	25	07:35 (43)	19:49	20:22	20	07:12 (101)	20:51
8	07:47		07:24		08:02 (41)	07:43		08:09 (43)	06:49	06:05		06:53 (101)	05:41
	17:02		17:40	26	08:28 (41)	19:15	26	08:35 (43)	19:51	20:23	18	07:11 (101)	20:52
9	07:47		07:23		08:03 (41)	07:41		08:08 (43)	06:48	06:03		06:55 (101)	05:41
	17:03		17:41	25	08:28 (41)	19:16	29	08:37 (43)	19:52	20:24	14	07:09 (101)	20:52
10	07:46		07:22		08:03 (41)	07:39		08:07 (43)	06:46	06:02		06:58 (101)	05:40
	17:04		17:42	23	08:26 (41)	19:17	30	08:37 (43)	19:53	20:25	8	07:06 (101)	20:53
11	07:46		07:21		08:05 (41)	07:38		08:06 (43)	06:44	06:01			05:40
	17:05		17:44	20	08:25 (41)	19:19	31	08:37 (43)	19:54	20:26			20:54
12	07:46		07:19		08:06 (41)	07:36		08:06 (43)	06:43	06:00			05:40
	17:06		17:45	18	08:24 (41)	19:20	31	08:37 (43)	19:55	20:28			20:54
13	07:46		07:18		08:07 (41)	07:34		08:06 (43)	06:41	05:59			05:40
	17:07		17:46	15	08:22 (41)	19:21	31	08:37 (43)	19:56	20:29			20:55
14	07:45		07:17		08:11 (41)	07:33		08:05 (43)	06:39	05:58			05:40
	17:08		17:48	8	08:19 (41)	19:22	31	08:36 (43)	19:57	20:30			20:55
15	07:45		07:15			07:31		08:05 (43)	06:38	05:57			05:40
	17:09		17:49			19:23	30	08:35 (43)	19:59	20:31			20:56
16	07:44		07:14			07:29		08:06 (43)	06:36	07:03 (101) 05:56			05:40
	17:11		17:50			19:24	29	08:35 (43)	20:00	7 07:10 (101) 20:32			20:56
17	07:44		07:12			07:27		08:06 (43)	06:35	06:58 (101) 05:55			05:40
	17:12		17:52			19:26	28	08:34 (43)	20:00	15 07:13 (101) 20:33			20:56
18	07:43		07:11			07:26		08:06 (43)	06:33	06:57 (101) 05:54			05:40
	17:13		17:53			19:27	27	08:33 (43)	20:01	19 07:16 (101) 20:34			20:57
19	07:43		07:10			07:24		08:06 (43)	06:31	06:54 (101) 05:53			05:40
	17:14		17:54			19:28	25	08:31 (43)	20:02	23 07:17 (101) 20:35			20:57
20	07:42		07:08			07:22		08:08 (43)	06:30	06:52 (101) 05:52			05:40
	17:15		17:55			19:29	22	08:30 (43)	20:03	25 07:17 (101) 20:36			20:58
21	07:41		07:07			07:20		08:09 (43)	06:28	06:52 (101) 05:51			05:40
	17:17		17:57			19:30	19	08:28 (43)	20:04	27 07:19 (101) 20:37			20:58
22	07:41		07:05			07:19		08:11 (43)	06:27	06:50 (101) 05:50			05:41
	17:18		17:58			19:31	14	08:25 (43)	20:05	29 07:19 (101) 20:38			20:58
23	07:40		07:04			07:17		08:16 (43)	06:25	06:50 (101) 05:49			05:41
	17:19	6 08:09 (41)	17:59			19:32	3 08:19 (43)	20:06	30 07:20 (101) 20:39				20:58
24	07:39		07:02			07:15		06:24	06:49 (101) 05:49				05:41
	17:20	12 08:19 (41)	18:00			19:34		20:08	30 07:19 (101) 20:40				20:58
25	07:39		07:01			07:14		06:22	06:49 (101) 05:48				05:41
	17:22	15 08:20 (41)	18:02			19:35		20:09	31 07:20 (101) 20:41				20:59
26	07:38		06:59			07:12		06:21	06:49 (101) 05:47				05:42
	17:23	18 08:22 (41)	18:03			19:36		20:10	31 07:20 (101) 20:42				20:59
27	07:37		06:57			07:10		06:19	06:48 (101) 05:46				05:42
	17:24	20 08:23 (41)	18:04			19:37		20:11	32 07:20 (101) 20:42				20:59
28	07:36		06:56			07:08		06:18	06:48 (101) 05:46				05:42
	17:25	22 08:24 (41)	18:05			19:38		20:12	32 07:20 (101) 20:43				20:59
29	07:35		06:51 (41)			07:07		06:16	06:47 (101) 05:45				05:43
	17:27	24 08:25 (41)				19:39		20:13	32 07:19 (101) 20:44				20:59
30	07:34		06:51 (41)			07:05		06:15	06:48 (101) 05:45				05:43
	17:28	25 08:26 (41)				19:40		20:14	31 07:19 (101) 20:45				20:59
31	07:33		06:51 (41)			07:03				05:44			
	17:29	26 08:27 (41)				19:42				20:46			
Potential sun hours	294		295			370		401		452			457
Total, worst case	168		325			483		394		224			
Sun reduction	0.31		0.38			0.46		0.51		0.56			
Oper. time red.	1.00		1.00			1.00		1.00		1.00			
Wind dir. red.	0.58		0.58			0.59		0.64		0.64			
Total reduction	0.18		0.22			0.27		0.32		0.36			
Total, real	30		71			129		128		80			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

2015-08-31_Arkwright Summit_SFA

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Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 152 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1348)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	05:44	06:09	06:42	07:14	07:45 (43)	07:33 (41)
2	05:44	06:10	06:43	07:15	07:45 (43)	07:32 (41)
3	05:45	06:11	07:08 (101)	07:16	07:45 (43)	07:32 (41)
4	05:45	06:12	07:05 (101)	07:17	07:45 (43)	07:31 (41)
5	05:46	06:13	07:02 (101)	07:18	07:46 (43)	07:30 (41)
6	05:47	06:14	07:01 (101)	07:19	07:46 (43)	07:31 (41)
7	05:47	06:15	07:23 (101)	07:20	07:47 (43)	07:31 (41)
8	05:48	06:16	07:24 (101)	07:22	07:48 (43)	07:31 (41)
9	05:49	06:17	07:25 (101)	07:23	07:50 (43)	07:31 (41)
10	05:49	06:18	06:58 (101)	07:24	07:53 (43)	07:32 (41)
11	05:50	06:20	06:57 (101)	07:25	08:02 (43)	07:32 (41)
12	05:51	06:21	06:57 (101)	07:26	07:04	07:33 (41)
13	05:52	06:22	06:56 (101)	07:27	07:05	07:33 (41)
14	05:52	06:23	06:56 (101)	07:28	07:06	07:34 (41)
15	05:53	06:24	06:56 (101)	07:30	07:08	07:36 (41)
16	05:54	06:25	06:55 (101)	07:31	07:09	07:37 (41)
17	05:55	06:26	06:55 (101)	07:32	07:10	07:38 (41)
18	05:56	06:27	06:55 (101)	07:33	07:11	07:41 (41)
19	05:57	06:28	06:55 (101)	07:34	07:13	07:44 (41)
20	05:58	06:29	06:56 (101)	07:35	07:14	07:43
21	05:58	06:30	06:56 (101)	07:37	07:15	07:43
22	05:59	06:31	06:57 (101)	07:38	07:16	07:44
23	06:00	06:32	06:57 (101)	07:39	07:17	07:44
24	06:01	06:33	06:58 (101)	07:40	07:19	07:45
25	06:02	06:34	07:00 (101)	07:41	07:20	07:45
26	06:03	06:35	07:02 (101)	07:43	07:21	07:46
27	06:04	06:37	07:05 (101)	07:44	07:22	07:46
28	06:05	06:38	07:11	07:45	08:40 (41)	07:46
29	06:06	06:39	07:12	07:46	08:37 (41)	07:46
30	06:07	06:40	07:13	07:45	08:35 (41)	07:47
31	06:08	06:41	07:14	07:46	08:53 (41)	07:47
Potential sun hours	464	431	375	343	294	283
Total, worst case		625	251	306	433	
Sun reduction		0.64	0.57	0.50	0.29	
Oper. time red.		1.00	1.00	1.00	1.00	
Wind dir. red.		0.64	0.59	0.58	0.58	
Total reduction		0.41	0.33	0.29	0.17	
Total, real		254	83	89	72	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

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Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 153 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1349)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June
1	07:47	07:32	06:54	07:01	07:37 (112)	06:14
	16:55	17:31	18:07	19:43	08:53 (41)	20:15
2	07:47	07:31	06:53	07:00	07:36 (112)	06:12
	16:56	17:32	18:08	19:44	08:51 (41)	20:16
3	07:47	07:30	06:51	06:58	07:36 (112)	06:11
	16:57	17:33	18:09	19:45	08:49 (41)	20:18
4	07:47	07:29	06:49	06:56	07:36 (112)	06:10
	16:58	17:35	18:10	19:46	08:46 (41)	20:19
5	07:47	07:28	06:48	07:31 (41)	07:38 (112)	06:08
	16:59	17:36	18:11	07:48 (41)	08:45 (41)	20:20
6	07:47	07:27	06:46	07:28 (41)	07:39 (112)	06:07
	17:00	17:37	18:13	07:52 (41)	08:42 (41)	20:21
7	07:47	07:25	07:52 (115)	07:25 (41)	07:39 (112)	06:06
	17:01	17:39	08:01 (115)	07:54 (41)	08:38 (41)	20:22
8	07:47	07:24	07:50 (115)	08:22 (41)	07:42 (112)	06:05
	17:02	17:40	08:04 (115)	08:56 (41)	08:32 (41)	20:23
9	07:47	07:23	07:48 (115)	08:21 (41)	07:45 (112)	06:03
	17:03	17:41	08:06 (115)	08:58 (41)	07:53 (112)	20:24
10	07:46	07:22	07:46 (115)	08:19 (41)	06:02	20:52
	17:04	17:42	08:07 (115)	08:59 (41)	20:25	20:53
11	07:46	07:21	07:46 (115)	08:17 (41)	06:01	20:50
	17:05	17:44	08:08 (115)	09:00 (41)	20:26	20:54
12	07:46	07:19	07:46 (115)	08:16 (41)	06:00	20:50
	17:06	17:45	08:09 (115)	09:02 (41)	20:27	20:54
13	07:46	07:18	07:44 (115)	08:14 (41)	05:59	20:50
	17:07	17:46	08:09 (115)	09:02 (41)	20:29	20:55
14	07:45	07:17	07:44 (115)	08:13 (41)	05:58	20:50
	17:08	17:48	08:10 (115)	09:02 (41)	20:30	20:55
15	07:45	07:15	07:44 (115)	08:12 (41)	05:57	20:50
	17:09	17:49	08:09 (115)	09:02 (41)	20:31	20:56
16	07:44	07:14	07:44 (115)	08:12 (41)	05:56	20:50
	17:11	17:50	08:10 (115)	09:03 (41)	20:32	20:56
17	07:44	07:12	07:44 (115)	08:11 (41)	05:55	20:50
	17:12	17:52	08:10 (115)	09:03 (41)	20:33	20:56
18	07:43	07:11	07:44 (115)	08:10 (41)	05:54	20:50
	17:13	17:53	08:09 (115)	09:03 (41)	20:34	20:57
19	07:43	07:10	07:45 (115)	08:09 (41)	05:53	20:50
	17:14	17:54	08:09 (115)	09:03 (41)	20:35	20:57
20	07:42	07:08	07:45 (115)	08:09 (41)	05:52	20:50
	17:15	17:55	08:08 (115)	09:03 (41)	20:36	20:57
21	07:41	07:07	07:46 (115)	07:50 (112)	05:51	20:50
	17:17	17:57	08:07 (115)	09:03 (41)	20:37	20:58
22	07:41	07:05	07:47 (115)	07:46 (112)	05:50	20:50
	17:18	17:58	08:05 (115)	09:02 (41)	20:38	20:58
23	07:40	07:04	07:49 (115)	07:44 (112)	05:49	20:50
	17:19	17:59	08:04 (115)	09:01 (41)	20:39	20:58
24	07:39	07:02	07:51 (115)	07:43 (112)	05:49	20:50
	17:20	18:00	08:01 (115)	09:02 (41)	20:40	20:58
25	07:38	07:01	07:50 (115)	07:41 (112)	05:48	20:50
	17:22	18:02	08:02 (115)	09:01 (41)	20:41	20:58
26	07:38	06:59	07:51 (115)	07:40 (112)	05:47	20:50
	17:23	18:03	08:03 (115)	09:00 (41)	20:42	20:59
27	07:37	06:57	07:52 (115)	07:38 (112)	05:46	20:50
	17:24	18:04	08:04 (115)	08:58 (41)	20:42	20:59
28	07:36	06:56	07:53 (115)	07:37 (112)	05:46	20:50
	17:25	18:05	08:05 (115)	08:59 (41)	20:43	20:59
29	07:35		07:54 (115)	07:36 (112)	05:45	20:50
	17:27		08:06 (115)	08:57 (41)	20:44	20:59
30	07:34		07:55 (115)	07:35 (112)	05:45	20:50
	17:28		08:07 (115)	08:55 (41)	20:45	20:59
31	07:33		07:56 (115)	07:34 (112)	05:44	
	17:29		08:08 (115)	08:54 (41)	20:46	
Potential sun hours	294	295	370	401	452	457
Total, worst case		371	1524	442		839
Sun reduction		0.38	0.46	0.51		0.65
Oper. time red.		1.00	1.00	1.00		1.00
Wind dir. red.		0.59	0.59	0.60		0.69
Total reduction		0.22	0.27	0.30		0.44
Total, real		82	410	134		371

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

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Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 153 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1349)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

July		August		September		October		November		December	
1	05:44	06:26 (43)	06:09	06:42		07:14		07:54 (41)	06:50	07:16 (115)	07:27
2	05:44	06:28 (43)	06:10	06:43		07:15		07:55 (41)	06:51	07:17 (115)	07:28
3	05:45	06:28 (43)	06:11	06:44		07:16		07:56 (41)	06:53	07:20 (115)	07:29
4	05:45	06:29 (43)	06:12	06:45		07:17		07:57 (41)	06:54	07:22 (115)	07:30
5	05:46	06:30 (43)	06:13	06:46		07:18		07:59 (41)	06:55		07:31
6	05:47	06:31 (43)	06:14	06:47		07:19		08:00 (41)	06:56		07:32
7	05:47	06:32 (43)	06:15	06:48		07:20		08:02 (41)	06:58		07:33
8	05:48	06:34 (43)	06:16	06:49		07:22		08:05 (41)	06:59		07:34
9	05:49	06:36 (43)	06:17	06:50		07:23		08:10 (41)	07:00		07:35
10	05:49	06:39 (43)	06:18	06:51		07:24		08:20 (41)	07:02		07:36
11	05:50	06:47 (43)	06:28	06:52		07:25			07:03		07:36
12	05:51		06:21	06:53		07:26			07:04		07:37
13	05:52		06:22	06:54		07:27			07:05		07:38
14	05:52		06:23	06:56		07:28			07:06		07:39
15	05:53		06:24	06:57		07:29			07:08		07:39
16	05:54		06:25	06:58		07:31			07:09		07:40
17	05:55		06:26	06:59		07:32		08:27 (115)	07:10		07:41
18	05:56		06:27	07:00		07:33		08:29 (115)	07:11		07:42
19	05:57		06:28	07:01		07:34		08:34 (115)	07:13		07:42
20	05:58		06:29	07:02		07:35		08:35 (115)	07:14		07:43
21	05:58		06:30	07:03		07:37		08:36 (115)	07:15		07:43
22	05:59		06:31	07:04		07:38		08:39 (115)	07:16		07:44
23	06:00		06:32	07:05		07:39		08:41 (115)	07:17		07:44
24	06:01		06:33	07:06		07:40		08:42 (115)	07:19		07:45
25	06:02		06:34	07:07		07:41		08:44 (115)	07:20		07:45
26	06:03		06:35	07:08		07:43		08:46 (115)	07:21		07:46
27	06:04		06:36	07:09		07:44		08:48 (115)	07:22		07:46
28	06:05		06:38	07:11		07:45		08:49 (115)	07:23		07:46
29	06:06		06:39	07:12		07:46		08:51 (115)	07:24		07:46
30	06:07		06:40	07:13		07:48		08:53 (115)	07:25		07:47
31	06:08		06:41	07:14		07:49		08:55 (115)	07:26		07:47
Potential sun hours	464		431	375		343		294			283
Total, worst case		224		1698		614		58			
Sun reduction		0.67		0.57		0.50		0.29			
Oper. time red.		1.00		1.00		1.00		1.00			
Wind dir. red.		0.69		0.59		0.58		0.59			
Total reduction		0.46		0.34		0.29		0.17			
Total, real		102		569		178		10			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 85

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 182 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1354)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117		541	386	285 8,759

Idle start wind speed: Cut in wind speed from power curve

	January	February	March			April			May	June	July	August			September	October	November	December	
1	07:47	07:32	06:54			07:01	07:25 (36)	06:14	05:43	05:44	06:09		06:42	07:29 (36)	07:14	06:50	07:26		
	16:55	17:31	18:06			19:43	83	19:16 (51)	20:15	20:47	20:59	20:39	19:53	75	19:31 (111)	19:00	17:12	16:46	
2	07:47	07:31	06:53			07:00	07:25 (36)	06:12	05:43	05:44	06:10	06:43	06:43		07:27 (36)	07:15	06:51	07:28	
	16:56	17:32	18:08			19:44	83	19:16 (51)	20:16	20:47	20:58	20:38	19:51	79	19:29 (111)	18:58	17:10	16:46	
3	07:47	07:30	06:51			06:58	07:25 (36)	06:11	05:42	05:45	06:11	06:44	06:44		07:26 (36)	07:16	06:53	07:29	
	16:57	17:33	18:09			19:45	81	19:15 (51)	20:18	20:48	20:58	20:37	19:49	81	19:27 (111)	18:57	17:09	16:45	
4	07:47	07:29	06:49			06:56	07:25 (36)	06:10	05:42	05:45	06:12	06:45	06:45		07:24 (36)	07:17	06:54	07:30	
	16:58	17:35	18:10			19:46	84	19:24 (111)	20:19	20:49	20:58	20:36	19:48	86	19:26 (111)	18:55	17:08	16:45	
5	07:47	07:28	06:48			06:54	07:26 (36)	06:08	05:42	05:46	06:13	06:46	06:46		07:23 (36)	07:18	06:55	07:31	
	16:59	17:36	18:11			19:47	85	19:25 (111)	20:20	20:50	20:58	20:34	19:46	86	19:24 (111)	18:53	17:07	16:45	
6	07:47	07:27	06:46			06:53	07:26 (36)	06:07	05:41	05:47	06:14	06:47	06:47		07:22 (36)	07:19	06:56	07:32	
	16:59	17:37	18:13			19:48	86	19:26 (111)	20:21	20:50	20:58	20:33	19:44	86	19:22 (111)	18:52	17:05	16:45	
7	07:47	07:25	06:44			06:51	07:26 (36)	06:06	05:41	05:47	06:15	06:48	06:48		07:21 (36)	07:20	06:58	07:33	
	17:00	17:38	18:14			19:49	86	19:27 (111)	20:22	20:51	20:57	20:32	19:43	85	19:20 (111)	18:50	17:04	16:45	
8	07:47	07:24	07:43			06:49	07:27 (36)	06:05	05:41	05:48	06:16	06:49	06:49		07:20 (36)	07:22	06:59	07:34	
	17:02	17:40	19:15			19:51	86	19:29 (111)	20:23	20:52	20:57	20:31	19:41	85	19:19 (111)	18:48	17:03	16:45	
9	07:47	07:23	07:41			06:48	07:28 (36)	06:03	05:40	05:49	06:17	06:50	06:50		07:19 (36)	07:23	07:00	07:34	
	17:03	17:41	19:16			19:52	81	19:29 (111)	20:24	20:52	20:57	20:29	19:39	81	19:09 (51)	18:47	17:02	16:45	
10	07:46	07:22	07:39			06:46	07:28 (36)	06:02	05:40	05:49	06:18	06:51	06:51		07:18 (36)	07:24	07:01	07:35	
	17:04	17:42	19:17			19:53	79	19:30 (111)	20:25	20:53	20:56	20:28	19:37	83	19:09 (51)	18:45	17:01	16:45	
11	07:46	07:20	07:38			06:44	07:30 (36)	06:01	05:40	05:50	06:19	06:52	06:52		07:18 (36)	07:25	07:03	07:36	
	17:05	17:44	19:18			19:54	75	19:32 (111)	20:26	20:54	20:56	20:27	19:36	82	19:08 (51)	18:43	17:00	16:45	
12	07:46	07:19	07:36			06:43	07:31 (36)	06:00	05:40	05:51	06:20	06:53	06:53		07:17 (36)	07:26	07:04	07:37	
	17:06	17:45	19:20			19:55	68	19:33 (111)	20:27	20:54	20:55	20:25	19:34	83	19:08 (51)	18:42	16:59	16:45	
13	07:46	07:18	07:34			06:41	07:32 (36)	05:59	05:40	05:52	06:22	06:54	06:54		07:17 (36)	07:27	07:05	07:38	
	17:07	17:46	19:21			19:56	58	19:33 (111)	20:28	20:55	20:55	20:24	19:32	82	19:07 (51)	18:40	16:58	16:45	
14	07:45	07:16	07:32			06:39	07:35 (36)	05:58	05:40	05:52	06:23	06:55	06:55		07:16 (36)	07:28	07:06	07:39	
	17:08	17:48	19:22			19:57	44	19:35 (111)	20:30	20:55	20:54	20:23	19:30	81	19:06 (51)	18:38	16:57	16:45	
15	07:45	07:15	07:31		07:50 (36)	06:38	07:38 (36)	05:57	05:40	05:53	06:24	06:57	06:57		07:17 (36)	07:30	07:08	07:39	
	17:09	17:49	19:23	14	08:04 (36)	19:58	35	19:33 (111)	20:31	20:56	20:54	20:21	19:28	79	19:05 (51)	18:37	16:56	16:45	
16	07:44	07:14	07:29		07:49 (36)	06:36	19:13 (111)	05:56	05:40	05:54	06:25	06:58	06:58		07:18 (36)	07:31	07:09	07:40	
	17:10	17:50	19:24	19	08:08 (36)	20:00	20	19:33 (111)	20:32	20:56	20:53	20:20	19:27	74	19:03 (51)	18:35	16:55	16:45	
17	07:44	07:12	07:27		07:47 (36)	06:34	19:14 (111)	05:55	05:40	05:55	06:26	06:59	06:59		07:19 (36)	07:32	07:10	07:41	
	17:12	17:51	19:25	23	08:10 (36)	20:00	17	19:31 (111)	20:33	20:56	20:53	20:18	19:25	71	19:02 (51)	18:33	16:54	16:46	
18	07:43	07:11	07:26		07:45 (36)	06:33	19:15 (111)	05:54	05:40	05:56	06:27	07:00	07:00		07:20 (36)	07:33	07:11	07:41	
	17:13	17:53	19:27	26	08:11 (36)	20:01	14	19:29 (111)	20:34	20:57	20:52	20:17	19:23	66	19:00 (51)	18:32	16:53	16:46	
19	07:43	07:09	07:24		07:43 (36)	06:31	19:17 (111)	05:53	05:40	05:57	06:28	07:01	07:01		07:21 (36)	07:34	07:12	07:42	
	17:14	17:54	19:28	29	08:12 (36)	20:02	9	19:26 (111)	20:35	20:57	20:51	20:15	19:21	60	18:57 (51)	18:30	16:53	16:46	
20	07:42	07:08	07:22		07:42 (36)	06:30		05:52	05:40	05:57	06:29	07:02	07:02		07:22 (36)	07:35	07:14	07:43	
	17:15	17:55	19:29	32	08:14 (36)	20:03		20:36	20:57	20:50	20:14	19:20	19:20	52	18:54 (51)	18:29	16:52	16:47	
21	07:41	07:07	07:20		07:40 (36)	06:28		05:51	05:40	05:58	06:30	07:03	07:03		07:23 (36)	07:37	07:15	07:43	
	17:16	17:57	19:30	35	08:15 (36)	20:04		20:37	20:58	20:50	20:12	19:18	19:18	38	08:01 (36)	18:27	16:51	16:47	
22	07:41	07:05	07:19		07:38 (36)	06:27		05:50	05:40	05:59	06:31	07:04	07:04		07:24 (36)	07:38	07:16	07:44	
	17:18	17:58	19:31	37	08:15 (36)	20:05		20:38	20:58	20:49	20:11	19:16	19:16	35	07:59 (36)	18:26	16:50	16:48	
23	07:40	07:04	07:17		07:36 (36)	06:25		05:49	05:41	06:00	06:32	07:05	07:05		07:25 (36)	07:39	07:17	07:44	
	17:19	17:59	19:32	48	19:06 (51)	20:06		20:39	20:58	20:48	20:09	19:14	19:14	33	07:58 (36)	18:24	16:50	16:48	
24	07:39	07:02	07:15		07:35 (36)	06:24		05:48	05:41	06:01	06:33	19:21 (111)	07:06		07:26 (36)	07:40	07:19	07:45	
	17:20	18:00	19:34	57	19:10 (51)	20:07		20:40	20:58	20:47	20:08	10	19:31 (111)	19:13	30	07:56 (36)	18:23	16:49	16:49
25	07:38	07:00	07:13		07:33 (36)	06:22		05:48	05:41	06:02	06:34	19:18 (111)	07:07		07:27 (36)	07:41	07:20	07:45	
	17:22	18:02	19:35	64	19:12 (51)	20:09		20:41	20:58	20:46	20:06	15	19:33 (111)	19:11	27	07:54 (36)	18:21	16:49	16:50
26	07:38	06:59	07:12		07:31 (36)	06:21		05:47	05:42	06:03	06:35	19:16 (111)	07:08		07:29 (36)	07:43	07:21	07:45	
	17:23	18:03	19:36	69	19:13 (51)	20:10		20:41	20:59	20:45	20:04	18	19:34 (111)	19:09	24	07:53 (36)	18:20	16:48	16:50
27	07:37	06:57	07:10		07:29 (36)	06:19		05:46	05:42	06:04	06:36	19:15 (111)	07:09		07:30 (36)	07:44	07:22	07:46	
	17:24	18:04	19:37	74	19:14 (51)	20:11		20:42	20:59	20:44	20:03	20	19:35 (111)	19:07	20	07:50 (36)	18:18	16:48	16:51
28	07:36	06:56	07:08		07:28 (36)	06:18		05:46	05:42	06:05	06:37	07:40 (36)	07:10		07:31 (36)	07:45	07:23	07:46	
	17:25	18:05	19:38	78	19:15 (51)	20:12		20:43	20:59	20:43	20:01	35	19:35 (111)	19:05	16	07:47 (36)	18:17	16:47	16:52
29	07:35		07:06		07:26 (36)	06:16		05:45	05:43	06:06	06:39	07:36 (36)	07:12		07:32 (36)	07:46	07:24	07:46	
	17:27		19:39	81	19:16 (51)	20:13		20:44	20:59	20:42	19:58	45	19:36 (111)	19:04	9	07:41 (36)	18:16	16:47	16:52
30	07:34		07:05		07:25 (36)	06:15		05:44	05:43	06:07	06:40		07:33 (36)	07:13		07:48	07:25	07:47	
	17:28		19:40	83	19:16 (51)	20:14		20:45	20:59	20:41	19:56	59	19:34 (111)	19:02		18:14	16:46	16:53	
31	07:33		07:03		07:25 (36)			05:44		06:08	06:41		07:31 (36)			07:49		07:47	
	17:29		19:41	82	19:15 (51)			20:46		20:40	19:54	67	19:32 (111)			18:13	16:44	16:54	
Potential sun hours	294	295	370		401			452		457	464	431		375		343	294	283	
Total, worst case			851		1174							269		1789					
Sun reduction			0.46		0.51							0.64		0.57					
Oper. time red.			1.00		1.00							1.00		1.00					
Wind dir. red.			0.62		0.61							0.61		0.62					
Total reduction			0.28		0.31							0.39		0.35					
Total, real			242		368							105		629					

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 86

Licensed user:

EDR

217 Montgomery St.

US-SYRACUSE, NY 13202

(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 183 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1355)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	January	February	March		April		May		June		July		August		September		October		November	December
1	07:47 16:55	07:32 17:31	06:54 18:06		07:01 19:43	43	18:28 (51) 19:21 (111)	06:14 20:15	05:43 20:47	05:44 20:59	06:09 20:39		06:42 19:53	19	19:02 (111) 19:21 (111)	07:14 19:00		07:34 (36) 08:13 (36)	06:50 17:12	07:26 16:46
2	07:47 16:56	07:31 17:32	06:53 18:08		07:00 19:44	42	18:29 (51) 19:22 (111)	06:12 20:16	05:43 20:47	05:44 20:58	06:10 20:38		06:43 19:51	22	19:00 (111) 19:22 (111)	07:15 18:58	37	07:35 (36) 08:12 (36)	06:51 17:10	07:28 16:46
3	07:47 16:57	07:30 17:33	06:51 18:09		07:11 (36) 19:45	41	18:30 (51) 19:23 (111)	06:11 20:18	05:42 20:48	05:45 20:58	06:11 20:37		06:44 19:49	24	18:59 (111) 19:23 (111)	07:16 18:57	35	07:36 (36) 08:11 (36)	06:53 17:09	07:29 16:45
4	07:47 16:58	07:29 17:35	06:49 18:10	10	07:09 (36) 19:46	37	18:32 (51) 19:24 (111)	06:10 20:19	05:42 20:49	05:45 20:58	06:12 20:36		06:45 19:48	25	18:58 (111) 19:23 (111)	07:17 18:55	32	07:37 (36) 08:09 (36)	06:54 17:08	07:30 16:45
5	07:47 16:59	07:28 17:36	06:48 18:11	15	07:07 (36) 19:47	36	18:31 (36) 19:25 (111)	06:08 20:20	05:42 20:50	05:46 20:58	06:13 20:34		06:46 19:46	26	18:57 (111) 19:23 (111)	07:18 18:53	30	07:38 (36) 08:08 (36)	06:55 17:07	07:31 16:45
6	07:47 17:00	07:27 17:37	06:46 18:13	19	07:06 (36) 19:48	24	18:33 (36) 19:26 (111)	06:07 20:21	05:41 20:50	05:47 20:58	06:14 20:33		06:47 19:44	27	18:57 (111) 19:22 (111)	07:19 18:52	30	07:40 (36) 08:07 (36)	06:56 17:05	07:32 16:45
7	07:47 17:00	07:25 17:38	06:44 18:14	23	07:04 (36) 19:49	25	18:34 (36) 19:27 (111)	06:06 20:22	05:41 20:51	05:47 20:57	06:15 20:32		06:48 19:43	28	18:56 (111) 19:20 (111)	07:20 18:50	27	07:41 (36) 08:05 (36)	06:57 17:04	07:33 16:45
8	07:47 17:02	07:24 17:40	07:43 19:15	26	08:02 (36) 19:51	26	19:01 (111) 19:26 (111)	06:05 20:23	05:41 20:52	05:48 20:57	06:16 20:31		06:49 19:41	29	18:28 (51) 19:19 (111)	07:22 18:48	24	07:42 (36) 08:03 (36)	06:59 17:03	07:34 16:45
9	07:47 17:03	07:23 17:41	07:41 19:16	29	08:01 (36) 19:52	25	19:01 (111) 19:25 (111)	06:03 20:24	05:40 20:52	05:49 20:57	06:17 20:29		06:50 19:39	30	18:24 (51) 19:17 (111)	07:23 18:47	21	07:43 (36) 08:01 (36)	07:00 17:02	07:35 16:45
10	07:46 17:04	07:22 17:42	07:39 19:17	31	07:59 (36) 19:53	24	19:01 (111) 19:23 (111)	06:02 20:25	05:40 20:53	05:49 20:56	06:18 20:28		06:51 19:37	31	18:22 (51) 19:15 (111)	07:24 18:45	20	07:44 (36) 07:57 (36)	07:01 17:01	07:36 16:45
11	07:46 17:05	07:20 17:44	07:38 19:18	34	07:57 (36) 19:54	22	19:03 (111) 19:22 (111)	06:01 20:26	05:40 20:54	05:50 20:56	06:19 20:27		06:52 19:36	32	18:20 (51) 19:13 (111)	07:25 18:43	19	07:45 (36) 07:48 (36)	07:03 17:00	07:37 16:45
12	07:46 17:06	07:19 17:45	07:36 19:20	36	07:55 (36) 19:55	19	19:04 (111) 19:20 (111)	06:00 20:27	05:40 20:54	05:51 20:55	06:20 20:25		06:53 19:34	33	18:18 (51) 19:12 (111)	07:26 18:42	18	07:46 (36) 07:49 (36)	07:04 17:00	07:38 16:45
13	07:46 17:07	07:18 17:46	07:34 19:21	38	07:54 (36) 19:56	16	19:06 (111) 19:17 (111)	05:59 20:28	05:40 20:55	05:52 20:55	06:22 20:24		06:54 19:32	34	07:53 (36) 19:10 (111)	07:27 18:40	17	07:47 (36) 07:50 (36)	07:05 17:00	07:39 16:45
14	07:45 17:08	07:17 17:48	07:32 19:22	49	07:52 (36) 19:57	11	18:51 (51) 19:26 (111)	05:58 20:30	05:40 20:55	05:52 20:54	06:23 20:23		06:55 19:30	35	07:49 (36) 19:08 (111)	07:28 18:38	16	07:48 (36) 07:51 (36)	07:06 17:00	07:40 16:45
15	07:45 17:09	07:15 17:49	07:31 19:23	59	07:50 (36) 19:58		18:54 (51) 19:27 (111)	05:57 20:31	05:40 20:56	05:53 20:54	06:24 20:21		06:57 19:28	36	07:45 (36) 19:06 (111)	07:30 18:37	15	07:49 (36) 07:52 (36)	07:07 17:00	07:41 16:45
16	07:44 17:10	07:14 17:50	07:29 19:24	65	07:50 (36) 20:00		18:56 (51) 19:28 (111)	05:56 20:32	05:40 20:56	05:54 20:53	06:25 20:20		06:58 19:27	37	07:43 (36) 18:49 (51)	07:31 18:35	14	07:50 (36) 07:53 (36)	07:08 17:00	07:42 16:45
17	07:44 17:12	07:12 17:51	07:27 19:25	69	07:50 (36) 20:01		18:58 (51) 19:29 (111)	05:55 20:33	05:40 20:56	05:55 20:53	06:26 20:18		06:59 19:25	38	07:41 (36) 18:48 (51)	07:32 18:33	13	07:51 (36) 07:54 (36)	07:09 17:00	07:43 16:45
18	07:43 17:13	07:11 17:53	07:26 19:27	71	07:49 (36) 20:01		18:59 (51) 19:30 (111)	05:54 20:34	05:40 20:57	05:56 20:52	06:27 20:17		07:00 19:23	39	07:39 (36) 18:48 (51)	07:33 18:32	12	07:52 (36) 07:55 (36)	07:10 17:00	07:44 16:45
19	07:43 17:14	07:09 17:54	07:24 19:28	75	07:49 (36) 20:02		19:00 (51) 19:31 (111)	05:53 20:35	05:40 20:57	05:57 20:51	06:28 20:15		07:01 19:21	40	07:38 (36) 18:47 (51)	07:34 18:30	11	07:53 (36) 07:56 (36)	07:11 17:00	07:45 16:45
20	07:42 17:15	07:08 17:55	07:22 19:29	75	07:50 (36) 20:03		19:01 (51) 19:32 (111)	05:52 20:36	05:40 20:58	05:57 20:50	06:29 20:14		07:02 19:20	41	07:36 (36) 18:47 (51)	07:35 18:29	10	07:54 (36) 07:57 (36)	07:12 17:00	07:46 16:45
21	07:41 17:16	07:07 17:57	07:20 19:30	75	07:50 (36) 20:04		19:02 (51) 19:33 (111)	05:51 20:37	05:40 20:59	05:58 20:51	06:30 20:12		07:03 19:18	42	07:35 (36) 18:47 (51)	07:37 18:27	9	07:55 (36) 07:58 (36)	07:13 17:00	07:47 16:45
22	07:41 17:17	07:05 17:58	07:19 19:31	76	07:50 (36) 20:05		19:03 (51) 19:34 (111)	05:50 20:38	05:40 20:59	05:59 20:50	06:31 20:11		07:04 19:16	43	07:34 (36) 18:46 (51)	07:38 18:26	8	07:56 (36) 07:59 (36)	07:14 17:00	07:48 16:45
23	07:40 17:19	07:04 17:59	07:17 19:32	75	07:50 (36) 20:06		19:04 (51) 19:35 (111)	05:49 20:39	05:41 20:58	06:00 20:48	06:32 20:09		07:05 19:14	44	07:33 (36) 18:45 (51)	07:39 18:24	7	07:57 (36) 08:00 (36)	07:15 17:00	07:49 16:45
24	07:39 17:20	07:02 18:00	07:15 19:34	74	07:51 (36) 20:07		19:05 (51) 19:36 (111)	05:48 20:40	05:41 20:59	06:01 20:47	06:33 20:08		07:06 19:13	45	07:32 (36) 18:44 (51)	07:40 18:23	6	07:58 (36) 08:01 (36)	07:16 17:00	07:50 16:45
25	07:38 17:22	07:00 18:02	07:13 19:35	70	07:52 (36) 20:09		19:06 (51) 19:37 (111)	05:47 20:41	05:41 20:58	06:02 20:46	06:34 20:06		07:07 19:11	46	07:31 (36) 18:43 (51)	07:41 18:21	5	07:59 (36) 08:02 (36)	07:17 17:00	07:51 16:45
26	07:38 17:23	06:59 18:03	07:12 19:36	70	07:52 (36) 20:10		19:07 (51) 19:38 (111)	05:47 20:41	05:42 20:59	06:03 20:45	06:35 20:04		07:08 19:09	47	07:30 (36) 18:42 (51)	07:42 18:20	4	08:00 (36) 08:03 (36)	07:18 17:00	07:52 16:45
27	07:37 17:24	06:57 18:04	07:10 19:37	68	07:53 (36) 20:11		19:08 (51) 19:39 (111)	05:46 20:42	05:42 20:59	06:04 20:44	06:36 20:03		07:09 19:07	48	07:29 (36) 18:40 (51)	07:43 18:18	3	08:04 (36) 08:07 (36)	07:19 17:00	07:53 16:45
28	07:36 17:25	06:56 18:05	07:08 19:38	62	07:56 (36) 20:12		19:09 (51) 19:40 (111)	05:46 20:43	05:42 20:59	06:05 20:43	06:37 20:01		07:10 19:05	49	07:28 (36) 18:38 (51)	07:44 18:17	2	08:05 (36) 08:08 (36)	07:20 17:00	07:54 16:45
29	07:35 17:27	06:55 18:06	07:06 19:39	61	07:57 (36) 20:13		19:10 (51) 19:41 (111)	05:45 20:44	05:43 20:59	06:06 20:42	06:39 19:58		07:12 19:04	50	07:27 (36) 18:36 (51)	07:45 18:16	1	08:06 (36) 08:09 (36)	07:21 17:00	07:55 16:45
30	07:34 17:28	06:54 18:07	07:05 19:40	55	08:01 (36) 20:14		19:11 (51) 19:42 (111)	05:44 20:45	05:43 20:59	06:07 20:41	06:40 19:56		07:13 19:02	51	07:26 (36) 18:35 (51)	07:46 18:14		08:10 (36) 08:13 (36)	07:22 17:00	07:56 16:45
31	07:33 17:29	06:53 18:08	07:03 19:41	43	18:26 (51) 19:19 (111)		19:12 (51) 19:43 (111)	05:44 20:46	05:43 20:40	06:08 20:41	06:41 19:54	11	07:14 19:02 (111)	52	07:25 (36) 18:32 (51)	07:47 18:14		08:11 (36) 08:14 (36)	07:23 17:00	07:57 16:45
Potential sun hours	294	295	370		401		452	457		464	431		375		343		294		283	
Total, worst case			1521		355								27		1594		277			
Sun reduction			0.46		0.51								0.64		0.57		0.50			
Oper. time red.			1.00		1.00								1.00		1.00		1.00			
Wind dir. red.			0.61		0.62								0.61		0.61		0.59			
Total reduction			0.28		0.31								0.39		0.35		0.30			
Total, real			425		112								11		556		82			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 87

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 184 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1356)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

January		February		March		April		May		June	
1	07:47	15:38 (115)	07:32		06:54	07:30 (32)	07:01	06:14		05:43	
	16:55	25	16:03 (115)	17:31		18:06	17:37 (112)	19:43	20:15	20:47	
2	07:47		15:38 (115)	07:31		06:53	07:34 (32)	07:00	06:12	05:43	
	16:56	26	16:04 (115)	17:32		18:08	17:37 (112)	19:44	20:16	20:47	
3	07:47		15:39 (115)	07:30		06:51	17:04 (112)	06:58	06:11	05:42	
	16:57	25	16:04 (115)	17:33		18:09	17:37 (112)	19:45	20:18	20:48	
4	07:47		15:40 (115)	07:29		06:49	17:04 (112)	06:56	06:10	05:42	
	16:58	24	16:04 (115)	17:35		18:10	17:36 (112)	19:46	20:19	20:49	
5	07:47		15:41 (115)	07:28		06:48	17:04 (112)	06:54	06:08	05:42	
	16:59	23	16:04 (115)	17:36		18:11	17:35 (112)	19:47	20:20	20:50	
6	07:47		15:42 (115)	07:27		06:46	17:05 (112)	06:53	06:07	05:41	
	17:00	22	16:04 (115)	17:37		18:13	17:35 (112)	19:48	20:21	20:50	
7	07:47		15:43 (115)	07:25		06:44	17:06 (112)	06:51	06:06	05:41	
	17:01	21	16:04 (115)	17:38		18:14	17:34 (112)	19:49	20:22	20:51	
8	07:47		15:44 (115)	07:24		07:43	18:06 (112)	06:49	06:05	05:41	
	17:02	19	16:03 (115)	17:40		19:15	18:32 (112)	19:51	20:23	20:52	
9	07:47		15:45 (115)	07:23		07:41	18:08 (112)	06:48	06:03	05:40	
	17:03	18	16:03 (115)	17:41		19:16	18:31 (112)	19:52	20:24	20:52	
10	07:46		15:47 (115)	07:22	07:42 (32)	07:39	18:09 (112)	06:46	06:02	05:40	
	17:04	16	16:03 (115)	17:42	2	07:44 (32)	19:17	19:53	20:25	20:53	
11	07:46		15:49 (115)	07:20		07:41 (32)	07:38	18:11 (112)	06:44	06:01	05:40
	17:05	13	16:02 (115)	17:44	6	07:47 (32)	19:18	18:26 (112)	19:54	20:26	20:54
12	07:46		15:50 (115)	07:19		07:39 (32)	07:36	18:16 (112)	06:43	06:00	05:40
	17:06	10	16:00 (115)	17:45	9	07:48 (32)	19:20	18:21 (112)	19:55	20:27	20:54
13	07:45		15:55 (115)	07:18		07:38 (32)	07:34		06:41	05:59	05:40
	17:07	3	15:58 (115)	17:46	12	07:50 (32)	19:21		19:56	20:28	20:55
14	07:45			07:16		07:37 (32)	07:32		06:39	05:58	05:40
	17:08			17:48	14	07:51 (32)	19:22		19:57	20:30	20:55
15	07:45			07:15		07:35 (32)	07:31		06:38	05:57	05:40
	17:09			17:49	17	07:52 (32)	19:23		19:58	20:31	20:56
16	07:44			07:14		07:34 (32)	07:29		06:36	05:56	05:40
	17:10			17:50	19	07:53 (32)	19:24		20:00	20:32	20:56
17	07:44			07:12		07:32 (32)	07:27		06:34	05:55	05:40
	17:12			17:51	21	07:53 (32)	19:25		20:00	20:33	20:56
18	07:43			07:11		07:31 (32)	07:26		06:33	05:54	05:40
	17:13			17:53	23	07:54 (32)	19:27		20:01	20:34	20:57
19	07:43			07:09		07:30 (32)	07:24		06:31	05:53	05:40
	17:14			17:54	33	17:27 (112)	19:28		20:02	20:35	20:57
20	07:42			07:08		07:28 (32)	07:22		06:30	05:52	05:40
	17:15			17:55	42	17:30 (112)	19:29		20:03	20:36	20:57
21	07:41			07:07		07:27 (32)	07:20		06:28	05:51	05:40
	17:16			17:57	48	17:33 (112)	19:30		20:04	20:37	20:58
22	07:41			07:05		07:25 (32)	07:19		06:27	05:50	05:40
	17:18			17:58	52	17:34 (112)	19:31		20:05	20:38	20:58
23	07:40			07:04		07:24 (32)	07:17		06:25	05:49	05:41
	17:19			17:59	55	17:35 (112)	19:32		20:06	20:39	20:58
24	07:39			07:02		07:24 (32)	07:15		06:24	05:48	05:41
	17:20			18:00	57	17:36 (112)	19:34		20:07	20:40	20:58
25	07:38			07:00		07:25 (32)	07:13		06:22	05:48	05:41
	17:22			18:02	56	17:36 (112)	19:35		20:09	20:41	20:58
26	07:38			06:59		07:26 (32)	07:12		06:21	05:47	05:42
	17:23			18:03	55	17:37 (112)	19:36		20:10	20:41	20:59
27	07:37			06:57		07:27 (32)	07:10		06:19	05:46	05:42
	17:24			18:04	53	17:37 (112)	19:37		20:11	20:42	20:59
28	07:36			06:56		07:29 (32)	07:08		06:18	05:46	05:42
	17:25			18:05	51	17:38 (112)	19:38		20:12	20:43	20:59
29	07:35					07:06			06:16	05:45	05:43
	17:27					19:39			20:13	20:44	20:59
30	07:34					07:05			06:15	05:44	05:43
	17:28					19:40			20:14	20:45	20:59
31	07:33					07:03				05:44	
	17:29					19:41				20:46	
Potential sun hours	294		295		370		401		452	457	
Total, worst case		245		625		328					
Sun reduction		0.31		0.38		0.46					
Oper. time red.		1.00		1.00		1.00					
Wind dir. red.		0.71		0.62		0.66					
Total reduction		0.22		0.24		0.31					
Total, real		55		148		100					

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 88

Licensed user:

EDR

217 Montgomery St.

US-SYRACUSE, NY 13202

(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 184 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1356)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

July		August		September		October		November		December	
1	05:44	06:09	06:42	07:14				06:50		07:12 (32)	07:26
	20:59	20:39	19:53	19:00				17:12		07:13 (32)	16:46
2	05:44	06:10	06:43	07:15			17:52 (112)	06:51	1		16:46
	20:58	20:38	19:51	18:58	11		18:03 (112)	17:10			15:30 (115)
3	05:45	06:11	06:44	07:16			17:48 (112)	06:53			16:46
	20:58	20:37	19:49	18:57	18		18:06 (112)	17:09			15:46 (115)
4	05:45	06:12	06:45	07:17			17:46 (112)	06:54			16:45
	20:58	20:36	19:48	18:55	21		18:07 (112)	17:08			15:47 (115)
5	05:46	06:13	06:46	07:18			17:44 (112)	06:55			16:45
	20:58	20:34	19:46	18:53	24		18:08 (112)	17:07			15:48 (115)
6	05:47	06:14	06:47	07:19			17:43 (112)	06:56			16:45
	20:58	20:33	19:44	18:52	27		18:10 (112)	17:05			15:49 (115)
7	05:47	06:15	06:48	07:20			17:41 (112)	06:58			16:45
	20:57	20:32	19:43	18:50	29		18:10 (112)	17:04			15:50 (115)
8	05:48	06:16	06:49	07:22			17:40 (112)	06:59			16:45
	20:57	20:31	19:41	18:48	31		18:11 (112)	17:03			15:51 (115)
9	05:49	06:17	06:50	07:23			17:39 (112)	07:00			16:45
	20:57	20:29	19:39	18:47	32		18:11 (112)	17:02			15:52 (115)
10	05:49	06:18	06:51	07:24			17:38 (112)	07:01			16:45
	20:56	20:28	19:37	18:45	33		18:11 (112)	17:01			15:53 (115)
11	05:50	06:19	06:52	07:25			17:38 (112)	07:03			16:45
	20:56	20:27	19:36	18:43	33		18:11 (112)	17:00			15:54 (115)
12	05:51	06:20	06:53	07:26			08:06 (32)	07:04			16:45
	20:55	20:25	19:34	18:42	43		18:11 (112)	16:59			15:53 (115)
13	05:52	06:22	06:54	07:27			08:03 (32)	07:05			16:45
	20:55	20:24	19:32	18:40	49		18:11 (112)	16:58			15:54 (115)
14	05:52	06:23	06:55	07:28			08:00 (32)	07:06			16:45
	20:54	20:23	19:30	18:38	52		18:10 (112)	16:57			15:55 (115)
15	05:53	06:24	06:57	07:30			07:59 (32)	07:08			16:45
	20:54	20:21	19:28	18:37	54		18:09 (112)	16:56			15:56 (115)
16	05:54	06:25	06:58	07:31			07:57 (32)	07:09			16:45
	20:53	20:20	19:27	18:35	56		18:08 (112)	16:55			15:57 (115)
17	05:55	06:26	06:59	07:32			07:57 (32)	07:10			16:45
	20:52	20:18	19:25	18:33	56		18:08 (112)	16:54			15:57 (115)
18	05:56	06:27	07:00	07:33			07:56 (32)	07:11			16:45
	20:52	20:17	19:23	18:32	56		18:07 (112)	16:53			15:58 (115)
19	05:57	06:28	07:01	07:34			07:55 (32)	07:12			16:46
	20:51	20:15	19:21	18:30	54		18:05 (112)	16:53			15:59 (115)
20	05:57	06:29	07:02	07:35			07:56 (32)	07:14			16:47
	20:50	20:14	19:20	18:29	51		18:04 (112)	16:52			15:31 (115)
21	05:58	06:30	07:03	07:37			07:58 (32)	07:15			16:47
	20:50	20:12	19:18	18:27	46		18:02 (112)	16:51			15:59 (115)
22	05:59	06:31	07:04	07:38			07:59 (32)	07:16			16:47
	20:49	20:11	19:16	18:26	40		18:00 (112)	16:50			15:32 (115)
23	06:00	06:32	07:05	07:39			08:00 (32)	07:17			16:48
	20:48	20:09	19:14	18:24	30		17:55 (112)	16:50			15:32 (115)
24	06:01	06:33	07:06	07:40			08:01 (32)	07:19			16:48
	20:47	20:08	19:13	18:23	22		08:23 (32)	16:49			15:32 (115)
25	06:02	06:34	07:07	07:41			08:03 (32)	07:20			16:49
	20:46	20:06	19:11	18:21	20		08:23 (32)	16:49			15:33 (115)
26	06:03	06:35	07:08	07:43			08:04 (32)	07:21			16:50
	20:45	20:04	19:09	18:20	18		08:22 (32)	16:48			15:34 (115)
27	06:04	06:36	07:09	07:44			08:05 (32)	07:22			16:50
	20:44	20:03	19:07	18:18	16		08:21 (32)	16:48			15:34 (115)
28	06:05	06:37	07:10	07:45			08:07 (32)	07:23			16:51
	20:43	20:01	19:05	18:17	14		08:21 (32)	16:47			15:35 (115)
29	06:06	06:39	07:12	07:46			08:08 (32)	07:24			16:52
	20:42	19:58	19:04	18:16	11		08:19 (32)	16:47	1	15:36 (115)	16:51
30	06:07	06:40	07:13	07:48			08:09 (32)	07:25		15:37 (115)	16:52
	20:41	19:56	19:02	18:14	8		08:17 (32)	16:46	9	15:32 (115)	16:53
31	06:08	06:41		07:49			08:11 (32)			15:41 (115)	16:53
	20:40	19:54		18:13	5		08:16 (32)			16:54	15:37 (115)
Potential sun hours	464	431	375	343			294			283	16:03 (115)
Total, worst case					960			11			787
Sun reduction					0.50			0.29			0.27
Oper. time red.					1.00			1.00			1.00
Wind dir. red.					0.63			0.70			0.71
Total reduction					0.32			0.20			0.19
Total, real					306			2			153

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
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Project:

2015-08-31_Arkwright Summit_SFA

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Licensed user:

EDR

217 Montgomery St.

US-SYRACUSE, NY 13202

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Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 190 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1359)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June
1 07:47	14:52 (105) 07:32	14:55 (105) 06:54		07:01	06:14	05:43
16:55	45 15:37 (105) 17:31	62 15:57 (105) 18:06		19:42	20:15	20:46
2 07:47	14:53 (105) 07:31	14:56 (105) 06:52		06:59	06:12	05:43
16:56	45 15:38 (105) 17:32	61 15:57 (105) 18:08		19:44	20:16	20:47
3 07:47	14:53 (105) 07:30	14:56 (105) 06:51		06:58	06:11	05:42
16:57	46 15:39 (105) 17:33	61 15:57 (105) 18:09		19:45	20:17	20:48
4 07:47	14:53 (105) 07:29	14:56 (105) 06:49		06:56	06:10	05:42
16:58	47 15:40 (105) 17:34	60 15:56 (105) 18:10		19:46	20:18	20:49
5 07:47	14:53 (105) 07:28	14:57 (105) 06:48		06:54	06:08	05:42
16:59	48 15:41 (105) 17:36	59 15:56 (105) 18:11		19:47	20:20	20:50
6 07:47	14:53 (105) 07:26	14:58 (105) 06:46		06:53	06:07	05:41
17:00	49 15:42 (105) 17:37	58 15:56 (105) 18:12		19:48	20:21	20:50
7 07:47	14:52 (105) 07:25	14:59 (105) 06:44		06:51	06:06	05:41
17:01	50 15:42 (105) 17:38	57 15:56 (105) 18:14		19:49	20:22	20:51
8 07:47	14:53 (105) 07:24	15:00 (105) 07:43		06:49	06:04	05:41
17:02	50 15:43 (105) 17:40	56 15:56 (105) 19:15		19:50	20:23	20:52
9 07:46	14:53 (105) 07:23	15:00 (105) 07:41		06:48	06:03	05:40
17:03	51 15:44 (105) 17:41	54 15:54 (105) 19:16		19:52	20:24	20:52
10 07:46	14:53 (105) 07:22	15:01 (105) 07:39		06:46	06:02	05:40
17:04	52 15:45 (105) 17:42	53 15:54 (105) 19:17		19:53	20:25	20:53
11 07:46	14:52 (105) 07:20	15:03 (105) 07:38	18:18 (57)	06:44	06:01	05:40
17:05	53 15:45 (105) 17:44	51 15:54 (105) 19:18	10 18:28 (57)	19:54	20:26	20:53
12 07:46	14:53 (105) 07:19	15:03 (105) 07:36	18:14 (57)	06:43	06:00	05:40
17:06	54 15:47 (105) 17:45	49 15:52 (105) 19:20	17 18:31 (57)	19:55	20:27	20:54
13 07:45	14:53 (105) 07:18	15:05 (105) 07:34	18:13 (57)	06:41	05:59	05:40
17:07	55 15:48 (105) 17:46	46 15:51 (105) 19:21	20 18:33 (57)	19:56	20:28	20:54
14 07:45	14:53 (105) 07:16	15:07 (105) 07:32	18:11 (57)	06:39	05:58	05:40
17:08	55 15:48 (105) 17:48	44 15:51 (105) 19:22	23 18:34 (57)	19:57	20:29	20:55
15 07:45	14:53 (105) 07:15	15:08 (105) 07:31	18:09 (57)	06:38	05:57	05:40
17:09	56 15:49 (105) 17:49	41 15:49 (105) 19:23	26 18:35 (57)	19:58	20:30	20:55
16 07:44	14:53 (105) 07:14	15:10 (105) 07:29	18:07 (57)	06:36	05:56	05:40
17:10	57 15:50 (105) 17:50	38 15:48 (105) 19:24	29 18:36 (57)	19:59	20:31	20:56
17 07:44	14:52 (105) 07:12	15:12 (105) 07:27	18:07 (57)	06:34	05:55	05:40
17:12	58 15:50 (105) 17:51	33 15:45 (105) 19:25	30 18:37 (57)	20:01	20:32	20:56
18 07:43	14:53 (105) 07:11	15:15 (105) 07:25	18:06 (57)	06:33	05:54	05:40
17:13	58 15:51 (105) 17:53	29 15:44 (105) 19:27	31 18:37 (57)	20:01	20:34	20:57
19 07:42	14:52 (105) 07:09	15:17 (105) 07:24	18:05 (57)	06:31	05:53	05:40
17:14	59 15:51 (105) 17:54	23 15:40 (105) 19:28	32 18:37 (57)	20:02	20:35	20:57
20 07:42	14:52 (105) 07:08	15:22 (105) 07:22	18:05 (57)	06:30	05:52	05:40
17:15	60 15:52 (105) 17:55	14 15:36 (105) 19:29	31 18:36 (57)	20:03	20:36	20:57
21 07:41	14:53 (105) 07:06	15:20 (105) 07:20	18:05 (57)	06:28	05:51	05:40
17:16	60 15:53 (105) 17:56	19:30	32 18:37 (57)	20:04	20:37	20:57
22 07:41	14:53 (105) 07:05	15:19 (105) 07:19	18:05 (57)	06:27	05:50	05:40
17:18	60 15:53 (105) 17:58	19:31	31 18:36 (57)	20:05	20:37	20:58
23 07:40	14:53 (105) 07:03	15:17 (105) 07:17	18:05 (57)	06:25	05:49	05:41
17:19	61 15:54 (105) 17:59	19:32	30 18:35 (57)	20:06	20:38	20:58
24 07:39	14:53 (105) 07:02	15:15 (105) 07:15	18:05 (57)	06:24	05:48	05:41
17:20	61 15:54 (105) 18:00	19:33	29 18:34 (57)	20:07	20:39	20:58
25 07:38	14:54 (105) 07:00	15:13 (105) 07:13	18:06 (57)	06:22	05:48	05:41
17:21	61 15:55 (105) 18:01	19:35	28 18:34 (57)	20:08	20:40	20:58
26 07:37	14:54 (105) 06:59	15:12 (105) 07:12	18:06 (57)	06:21	05:47	05:42
17:23	61 15:55 (105) 18:03	19:36	26 18:32 (57)	20:10	20:41	20:58
27 07:37	14:54 (105) 06:57	15:10 (105) 07:10	18:07 (57)	06:19	05:46	05:42
17:24	62 15:56 (105) 18:04	19:37	24 18:31 (57)	20:11	20:42	20:58
28 07:36	14:54 (105) 06:56	15:08 (105) 07:08	18:08 (57)	06:18	05:46	05:42
17:25	62 15:56 (105) 18:05	19:38	21 18:29 (57)	20:12	20:43	20:58
29 07:35	14:54 (105) 06:54	15:06 (105) 07:06	18:10 (57)	06:16	05:45	05:43
17:27	62 15:56 (105) 18:05	19:39	17 18:27 (57)	20:13	20:44	20:58
30 07:34	14:54 (105) 06:53	15:05 (105) 07:05	18:13 (57)	06:15	05:44	05:43
17:28	62 15:56 (105) 18:04	19:40	10 18:23 (57)	20:14	20:45	20:58
31 07:33	14:55 (105) 06:52	15:03 (105) 07:03			05:44	
17:29	62 15:57 (105) 18:05	19:41			20:46	
Potential sun hours	294	295	370	401	452	457
Total, worst case	1722	949	497			
Sun reduction	0.31	0.38	0.46			
Oper. time red.	1.00	1.00	1.00			
Wind dir. red.	0.71	0.71	0.64			
Total reduction	0.22	0.27	0.29			
Total, real	382	258	146			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 90

Licensed user:

EDR

217 Montgomery St.

US-SYRACUSE, NY 13202

(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 190 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1359)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

July		August		September		October		November		December	
1	05:44	06:09	06:42			07:14		17:53 (57)	06:50	14:31 (105)	07:26
	20:58	20:39	19:53			19:00	18	18:11 (57)	17:12	15:24 (105)	16:46
2	05:44	06:10	06:43			07:15		17:55 (57)	06:51	14:30 (105)	07:27
	20:58	20:38	19:51			18:58	13	18:08 (57)	17:10	15:24 (105)	16:46
3	05:45	06:11	06:44			07:16		06:52		14:28 (105)	07:28
	20:58	20:37	19:49			18:57		17:09	56	15:24 (105)	16:45
4	05:45	06:12	06:45			07:17		06:54		14:28 (105)	07:29
	20:58	20:35	19:48			18:55		17:08	58	15:26 (105)	16:45
5	05:46	06:13	06:46			07:18		06:55		14:27 (105)	07:30
	20:58	20:34	19:46			18:53		17:07	59	15:26 (105)	16:45
6	05:47	06:14	06:47			07:19		06:56		14:27 (105)	07:31
	20:57	20:33	19:44			18:52		17:05	59	15:26 (105)	16:45
7	05:47	06:15	06:48			07:20		06:57		14:27 (105)	07:32
	20:57	20:32	19:42			18:50		17:04	60	15:27 (105)	16:45
8	05:48	06:16	06:49			07:21		06:59		14:26 (105)	07:33
	20:57	20:31	19:41			18:48		17:03	61	15:27 (105)	16:45
9	05:49	06:17	06:50			07:23		07:00		14:26 (105)	07:34
	20:56	20:29	19:39			18:46		17:02	61	15:27 (105)	16:45
10	05:49	06:18	06:51			07:24		07:01		14:26 (105)	07:35
	20:56	20:28	19:37			18:45		17:01	62	15:28 (105)	16:45
11	05:50	06:19	06:52			07:25		07:02		14:26 (105)	07:36
	20:56	20:27	19:35			18:43		17:00	61	15:27 (105)	16:45
12	05:51	06:20	06:53			07:26		07:04		14:25 (105)	07:37
	20:55	20:25	19:34			18:41		16:59	62	15:27 (105)	16:45
13	05:52	06:21	06:54		18:05 (57)	07:27		07:05		14:26 (105)	07:38
	20:55	20:24	19:32	9	18:14 (57)	18:40		16:58	62	15:28 (105)	16:45
14	05:52	06:23	06:55		18:01 (57)	07:28		07:06		14:26 (105)	07:38
	20:54	20:22	19:30	16	18:17 (57)	18:38		16:57	62	15:28 (105)	16:45
15	05:53	06:24	06:56		17:58 (57)	07:29		07:07		14:26 (105)	07:39
	20:54	20:21	19:28	21	18:19 (57)	18:37		16:56	62	15:28 (105)	16:45
16	05:54	06:25	06:57		17:56 (57)	07:31		07:09		14:27 (105)	07:40
	20:53	20:20	19:27	24	18:20 (57)	18:35		16:55	61	15:28 (105)	16:45
17	05:55	06:26	06:59		17:55 (57)	07:32		07:10		14:27 (105)	07:41
	20:52	20:18	19:25	25	18:20 (57)	18:33		16:54	61	15:28 (105)	16:46
18	05:56	06:27	07:00		17:53 (57)	07:33		07:11		14:27 (105)	07:41
	20:52	20:17	19:23	28	18:21 (57)	18:32		16:53	61	15:28 (105)	16:46
19	05:57	06:28	07:01		17:52 (57)	07:34		07:12		14:28 (105)	07:42
	20:51	20:15	19:21	29	18:21 (57)	18:30		16:53	61	15:29 (105)	16:46
20	05:57	06:29	07:02		17:51 (57)	07:35		07:14		14:28 (105)	07:42
	20:50	20:14	19:20	30	18:21 (57)	18:29		16:52	60	15:28 (105)	16:47
21	05:58	06:30	07:03		17:50 (57)	07:36		07:15		14:28 (105)	07:43
	20:49	20:12	19:18	31	18:21 (57)	18:27		16:51	60	15:28 (105)	16:47
22	05:59	06:31	07:04		17:50 (57)	07:38		07:16		14:29 (105)	07:44
	20:49	20:11	19:16	31	18:21 (57)	18:26	17	16:08 (105)	60	15:29 (105)	16:48
23	06:00	06:32	07:05		17:49 (57)	07:39		15:47 (105)		14:29 (105)	07:44
	20:48	20:09	19:14	32	18:21 (57)	18:24	25	16:12 (105)	59	15:28 (105)	16:48
24	06:01	06:33	07:06		17:49 (57)	07:40		15:43 (105)		14:30 (105)	07:44
	20:47	20:07	19:12	31	18:20 (57)	18:23	31	16:14 (105)	58	15:28 (105)	16:49
25	06:02	06:34	07:07		17:48 (57)	07:41		15:42 (105)		14:30 (105)	07:45
	20:46	20:06	19:11	31	18:19 (57)	18:21	34	16:16 (105)	58	15:28 (105)	16:50
26	06:03	06:35	07:08		17:48 (57)	07:42		15:39 (105)		14:32 (105)	07:45
	20:45	20:04	19:09	30	18:18 (57)	18:20	39	16:18 (105)	57	15:29 (105)	16:50
27	06:04	06:36	07:09		17:50 (57)	07:44		15:37 (105)		14:32 (105)	07:46
	20:44	20:03	19:07	28	18:18 (57)	18:18	42	16:19 (105)	56	15:28 (105)	16:51
28	06:05	06:37	07:10		17:50 (57)	07:45		15:35 (105)		14:33 (105)	07:46
	20:43	20:01	19:05	27	18:17 (57)	18:17	45	16:20 (105)	55	15:28 (105)	16:52
29	06:06	06:38	07:11		17:51 (57)	07:46		15:34 (105)		14:33 (105)	07:46
	20:42	19:58	19:04	25	18:16 (57)	18:16	47	16:21 (105)	55	15:28 (105)	16:52
30	06:07	06:40	07:13		17:52 (57)	07:47		15:33 (105)		14:34 (105)	07:46
	20:41	19:56	19:02	22	18:14 (57)	18:14	49	16:22 (105)	54	15:28 (105)	16:53
31	06:08	06:41			07:49			15:31 (105)			07:47
	20:40	19:54			18:13	51	16:22 (105)			16:54	44
Potential sun hours	463	431	375		343		294			283	
Total, worst case			470		411		1768			1382	
Sun reduction			0.57		0.50		0.29			0.27	
Oper. time red.			1.00		1.00		1.00			1.00	
Wind dir. red.			0.64		0.71		0.71			0.71	
Total reduction			0.36		0.36		0.21			0.19	
Total, real			172		146		367			267	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
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Project:

2015-08-31_Arkwright Summit_SFA

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Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 197 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1360)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	05:44	06:09	06:42	07:14	06:50	07:26
2	05:44	06:10	06:43	07:15	06:51	07:27
3	05:45	06:11	06:44	07:16	06:52	07:28
4	05:45	06:12	06:45	07:17	06:54	07:29
5	05:46	06:13	06:46	07:18	06:55	07:30
6	05:47	06:14	06:47	07:19	06:56	07:31
7	05:47	06:15	06:48	07:20	06:57	07:32
8	05:48	06:16	06:49	07:21	06:59	07:33
9	05:49	06:17	06:50	07:22	07:00	07:34
10	05:49	06:18	06:51	07:24	07:01	07:35
11	05:50	06:19	06:52	07:25	07:02	07:36
12	05:51	06:20	06:53	07:26	07:04	07:37
13	05:51	06:21	06:54	07:27	07:05	07:38
14	05:52	06:22	06:55	07:28	07:06	07:38
15	05:53	06:24	06:56	07:29	07:07	07:39
16	05:54	06:25	06:57	07:30	07:09	07:40
17	05:55	06:26	06:58	07:32	07:10	07:40
18	05:56	06:27	07:00	07:33	07:11	07:41
19	05:56	06:28	07:01	07:34	07:12	07:42
20	05:57	06:29	07:02	07:35	07:13	07:42
21	05:58	06:30	07:03	07:36	07:15	07:43
22	05:59	06:31	07:04	07:38	07:16	07:43
23	06:00	06:32	07:05	07:39	07:17	07:44
24	06:01	06:33	07:06	07:40	07:18	07:44
25	06:02	06:34	07:07	07:41	07:19	07:45
26	06:03	06:35	07:08	07:42	07:21	07:45
27	06:04	06:36	07:09	07:44	07:22	07:45
28	06:05	06:37	07:10	07:45	07:23	07:46
29	06:06	06:38	07:11	07:46	07:24	07:46
30	06:07	06:39	07:12	07:47	07:25	07:46
31	06:08	06:41	07:14	07:49	07:26	07:46
Potential sun hours	463	431	375	343	294	283
Total, worst case			380	684	762	1418
Sun reduction			0.57	0.50	0.29	0.27
Oper. time red.			1.00	1.00	1.00	1.00
Wind dir. red.			0.63	0.68	0.71	0.71
Total reduction			0.36	0.35	0.21	0.19
Total, real			138	236	158	273

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 93

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 212 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1374)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117		541	386	285 8,759

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:47 16:55 17:31	07:32 17:31 18:07	06:54 18:07 18:53	07:01 19:43 20:15	06:14 20:15 20:16	05:43 20:47 20:47	06:22 (115) 20:59 20:58	06:29 (115) 20:39 20:38	06:40 (115) 19:53 19:51	07:14 19:00 18:59	06:50 17:12 17:10	07:26 16:46 16:46
2	07:47 16:56 17:33	07:30 17:33 18:09	06:51 18:09 18:51	06:58 19:45 20:18	06:11 20:18 20:19	05:43 20:48 20:49	06:22 (115) 20:58 20:58	06:29 (115) 20:37 20:36	06:45 (115) 19:49 19:48	07:16 18:57 18:55	06:53 17:09 17:08	07:29 16:45 16:45
3	07:47 16:57 17:33	07:30 17:33 18:09	06:51 18:09 18:51	06:58 19:45 20:18	06:11 20:18 20:19	05:43 20:48 20:49	06:22 (115) 20:58 20:58	06:29 (115) 20:37 20:36	06:45 (115) 19:49 19:48	07:16 18:57 18:55	06:53 17:09 17:08	07:29 16:45 16:45
4	07:47 16:58 17:35	07:29 17:35 18:10	06:49 18:10 18:54	06:56 19:46 20:19	06:10 20:19 20:20	05:42 20:49 20:50	06:22 (115) 20:58 20:58	06:30 (115) 20:36 20:34	06:45 19:48 19:46	07:17 18:55 18:53	06:54 17:07 17:06	07:30 16:45 16:45
5	07:47 16:59 17:36	07:28 17:36 18:11	06:48 18:11 18:54	06:54 19:47 20:20	06:08 20:20 20:21	05:42 20:50 20:51	06:23 (115) 20:58 20:58	06:29 (115) 20:34 20:33	06:46 19:46 19:44	07:18 18:53 18:52	06:55 17:07 17:06	07:31 16:45 16:45
6	07:47 17:00 17:37	07:27 17:37 18:13	06:46 18:13 18:54	06:53 19:48 20:21	06:07 20:21 20:22	05:41 20:50 20:51	06:23 (115) 20:58 20:57	06:29 (115) 20:33 20:32	06:47 19:44 19:43	07:19 18:52 18:50	06:56 17:06 17:04	07:32 16:45 16:45
7	07:47 17:01 17:39	07:25 17:39 18:14	06:44 18:14 18:54	06:51 19:49 20:22	06:06 20:22 20:23	05:41 20:51 20:52	06:24 (115) 20:57 20:57	06:29 (115) 20:32 20:31	06:48 19:43 19:41	07:20 18:50 18:48	06:58 17:04 17:03	07:33 16:45 16:45
8	07:47 17:02 17:40	07:24 17:40 18:15	07:43 18:15 18:51	06:49 19:51 20:23	06:05 20:23 20:24	05:41 20:52 20:52	06:23 (115) 20:57 20:57	06:29 (115) 20:31 20:29	06:49 19:41 19:39	07:22 18:48 18:47	06:59 17:03 17:02	07:34 16:45 16:45
9	07:47 17:03 17:41	07:23 17:41 18:16	07:41 18:16 18:52	06:48 19:52 20:24	06:03 20:24 20:25	05:41 20:52 20:53	06:24 (115) 20:57 20:56	06:30 (115) 20:29 20:28	06:50 19:39 19:37	07:23 18:47 18:45	07:00 17:02 17:01	07:34 16:45 16:45
10	07:46 17:04 17:42	07:22 17:42 18:17	07:39 18:17 18:53	06:46 19:53 20:25	06:02 20:25 20:26	05:40 20:53 20:54	06:24 (115) 20:56 20:56	06:30 (115) 20:28 20:27	06:51 19:37 19:36	07:24 18:45 18:43	07:01 17:01 17:00	07:35 16:45 16:45
11	07:46 17:05 17:44	07:20 17:44 18:19	07:38 18:19 18:54	06:44 19:54 20:26	06:01 20:26 20:27	05:40 20:54 20:54	06:25 (115) 20:56 20:55	06:30 (115) 20:27 20:25	06:52 19:36 19:34	07:25 18:43 18:42	07:03 17:00 16:59	07:36 16:45 16:45
12	07:46 17:06 17:45	07:19 17:45 18:20	07:36 18:20 18:55	06:43 19:55 20:27	06:00 20:27 20:28	05:40 20:54 20:55	06:25 (115) 20:55 20:55	06:30 (115) 20:25 20:24	06:53 19:34 19:32	07:26 18:42 18:40	07:04 16:59 16:58	07:37 16:45 16:45
13	07:46 17:07 17:46	07:18 17:46 18:21	07:34 18:21 18:56	06:41 19:56 20:29	05:59 20:29 20:30	05:40 20:55 20:55	06:25 (115) 20:55 20:54	06:30 (115) 20:24 20:23	06:54 19:32 19:30	07:27 18:40 18:38	07:05 16:58 16:57	07:38 16:45 16:45
14	07:45 17:08 17:48	07:17 17:48 18:22	07:33 18:22 18:57	06:39 19:57 20:30	05:58 20:30 20:31	05:40 20:55 20:56	06:26 (115) 20:54 20:54	06:30 (115) 20:23 20:22	06:56 19:30 19:29	07:28 18:38 18:37	07:06 16:57 16:56	07:39 16:45 16:45
15	07:45 17:09 17:49	07:15 17:49 18:23	07:31 18:23 18:58	06:38 19:58 20:31	05:57 20:31 20:32	05:40 20:56 20:56	06:26 (115) 20:54 20:54	06:30 (115) 20:22 20:21	06:57 19:29 19:28	07:30 18:37 18:35	07:08 16:56 16:55	07:39 16:45 16:45
16	07:44 17:11 17:50	07:14 17:50 18:24	07:29 18:24 18:59	06:36 19:54 20:26	05:56 20:26 20:27	05:40 20:56 20:56	06:26 (115) 20:53 20:53	06:30 (115) 20:21 20:20	06:58 19:27 19:25	07:31 18:35 18:33	07:09 16:55 16:54	07:40 16:45 16:45
17	07:44 17:12 17:52	07:12 17:52 18:26	07:27 18:26 18:59	06:35 19:56 20:28	05:55 20:28 20:29	05:40 20:56 20:56	06:27 (115) 20:53 20:53	06:31 (115) 20:20 20:19	06:59 19:25 19:23	07:32 18:33 18:32	07:10 16:54 16:54	07:41 16:45 16:45
18	07:43 17:13 17:53	07:11 17:53 18:27	07:26 18:27 19:01	06:33 19:57 20:30	05:54 20:30 20:31	05:40 20:56 20:56	06:27 (115) 20:52 20:52	06:31 (115) 20:17 20:16	07:00 19:23 19:21	07:33 18:32 18:30	07:11 16:54 16:53	07:41 16:45 16:45
19	07:43 17:14 17:54	07:10 17:54 18:28	07:24 18:28 19:02	06:31 19:58 20:31	05:53 20:31 20:32	05:40 20:56 20:56	06:27 (115) 20:51 20:51	06:31 (115) 20:15 20:14	07:01 19:21 19:20	07:34 18:30 18:29	07:13 16:53 16:52	07:42 16:45 16:45
20	07:42 17:15 17:55	07:08 17:55 18:29	07:22 18:29 19:03	06:30 19:59 20:32	05:52 20:32 20:33	05:40 20:56 20:56	06:27 (115) 20:50 20:50	06:31 (115) 20:14 20:13	07:02 19:20 19:18	07:35 18:29 18:27	07:14 16:52 16:51	07:43 16:45 16:45
21	07:41 17:17 17:57	07:07 17:57 18:30	07:20 18:30 19:04	06:28 19:59 20:32	05:51 20:32 20:33	05:40 20:56 20:56	06:27 (115) 20:50 20:50	06:31 (115) 20:12 20:11	07:03 19:18 19:17	07:37 18:27 18:26	07:15 16:51 16:51	07:43 16:45 16:45
22	07:41 17:18 17:58	07:05 17:58 18:31	07:19 18:31 19:05	06:27 19:59 20:32	05:50 20:32 20:33	05:40 20:56 20:56	06:27 (115) 20:49 20:49	06:32 (115) 20:11 20:10	07:04 19:16 19:15	07:38 18:26 18:25	07:16 16:51 16:51	07:44 16:45 16:45
23	07:40 17:19 17:59	07:04 17:59 18:32	07:17 18:32 19:06	06:25 19:59 20:32	05:49 20:32 20:33	05:40 20:56 20:56	06:28 (115) 20:48 20:48	06:32 (115) 20:09 20:08	07:05 19:14 19:13	07:39 18:24 18:23	07:17 16:50 16:49	07:44 16:45 16:45
24	07:39 17:20 18:00	07:02 18:00 18:34	07:15 18:34 19:08	06:24 19:59 20:32	05:49 20:32 20:33	05:40 20:56 20:56	06:28 (115) 20:47 20:47	06:33 (115) 20:08 20:07	07:06 19:13 19:11	07:40 18:23 18:21	07:19 16:49 16:49	07:45 16:45 16:45
25	07:38 17:22 18:02	07:01 18:02 18:35	07:13 18:35 19:09	06:22 19:59 20:32	05:48 20:32 20:33	05:40 20:56 20:56	06:28 (115) 20:46 20:46	06:33 (115) 20:06 20:06	07:07 19:11 19:10	07:41 18:21 18:20	07:20 16:49 16:49	07:46 16:45 16:45
26	07:38 17:23 18:03	06:59 18:03 18:36	07:12 18:36 19:10	06:21 19:59 20:32	05:47 20:32 20:33	05:40 20:56 20:56	06:28 (115) 20:45 20:45	06:34 (115) 20:04 20:04	07:08 19:09 19:07	07:43 18:20 18:18	07:21 16:48 16:48	07:46 16:45 16:45
27	07:37 17:24 18:04	06:57 18:04 18:37	07:10 18:37 19:11	06:19 19:59 20:32	05:46 20:32 20:33	05:40 20:56 20:56	06:28 (115) 20:44 20:44	06:35 (115) 20:03 20:03	07:09 19:07 19:05	07:44 18:18 18:16	07:22 16:48 16:48	07:46 16:45 16:45
28	07:36 17:25 18:05	06:56 18:05 18:38	07:08 18:38 19:12	06:18 19:59 20:32	05:46 20:32 20:33	05:40 20:56 20:56	06:29 (115) 20:43 20:43	06:35 (115) 20:01 20:01	07:11 19:06 19:04	07:45 18:17 18:15	07:23 16:47 16:47	07:46 16:45 16:45
29	07:35 17:27 18:07	06:55 18:07 18:40	07:07 18:40 19:14	06:16 19:59 20:32	05:45 20:32 20:33	05:40 20:56 20:56	06:29 (115) 20:42 20:42	06:36 (115) 20:00 20:00	07:12 19:04 19:02	07:46 18:16 18:14	07:24 16:47 16:47	07:46 16:45 16:45
30	07:34 17:28 18:08	07:05 18:08 18:41	07:05 18:41 19:15	06:15 19:59 20:32	05:45 20:32 20:33	05:40 20:56 20:56	06:29 (115) 20:41 20:41	06:37 (115) 19:56 19:56	07:13 19:02 19:01	07:48 18:14 18:12	07:25 16:46 16:46	07:47 16:45 16:45
31	07:33 17:29	07:03 18:06	07:03 18:39	07:03 19:02	07:03 19:48	07:03 20:44	07:03 20:41	07:03 19:55	07:03 19:55	07:03 19:55	07:03 19:55	07:03 19:55
Potential sun hours	294	295	370	401	452	457	463	431	375	343	294	283
Total, worst case					666	1007	1035	431				
Sun reduction					0.56	0.65	0.67	0.64				
Oper. time red.					1.00	1.00	1.00	1.00				
Wind dir. red.					0.67	0.67	0.67	0.67				
Total reduction					0.38	0.44	0.45	0.43				
Total, real					251	441	467	19				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 94

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 213 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1375)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

January			February			March			April			May			June		
1	07:47	07:32	06:54						07:01			07:46 (115)	06:14		05:43		06:14 (112)
	16:55	17:31	18:07						19:43	25		08:11 (115)	20:15		20:47	34	06:48 (112)
2	07:47	07:31	06:53						07:00			07:47 (115)	06:12		05:43		06:13 (112)
	16:56	17:32	18:08						19:44	22		08:09 (115)	20:16		20:47	34	06:47 (112)
3	07:47	07:30	06:51						06:58			07:48 (115)	06:11		05:43		06:13 (112)
	16:57	17:33	18:09						19:45	19		08:07 (115)	20:18		20:48	35	06:48 (112)
4	07:47	07:29	06:49						06:56			07:50 (115)	06:10		05:42		06:13 (112)
	16:58	17:35	18:10						19:46	13		08:03 (115)	20:19		20:49	35	06:48 (112)
5	07:47	07:28	06:48						06:54				06:08		05:42		06:13 (112)
	16:59	17:36	18:11						19:47				20:20		20:50	36	06:49 (112)
6	07:47	07:27	06:46						06:53				06:07		05:41		06:13 (112)
	17:00	17:37	18:13						19:48				20:21		20:50	36	06:49 (112)
7	07:47	07:25	06:44						06:51				06:06		05:41		06:14 (112)
	17:01	17:39	18:14						19:49				20:22		20:51	36	06:50 (112)
8	07:47	07:24	07:43						06:49				06:05		05:41		06:13 (112)
	17:02	17:40	19:15						19:51				20:23		20:52	36	06:49 (112)
9	07:47	07:23	07:41						06:48				06:03		05:41		06:13 (112)
	17:03	17:41	19:16						19:52				20:24		20:52	37	06:50 (112)
10	07:46	07:22	07:39						06:46				06:02		05:40		06:13 (112)
	17:04	17:42	19:17						19:53				20:25		20:53	37	06:50 (112)
11	07:46	07:21	07:38						06:44				06:01		05:40		06:14 (112)
	17:05	17:44	19:19						19:54				20:26		20:54	37	06:51 (112)
12	07:46	07:19	07:36						06:43				06:00		05:40		06:14 (112)
	17:06	17:45	19:20						19:55				20:27		20:54	37	06:51 (112)
13	07:46	07:18	07:34						06:41				05:59		05:40		06:14 (112)
	17:07	17:46	19:21						19:56				20:29		20:55	37	06:51 (112)
14	07:45	07:17	07:33						06:39				05:58		05:40		06:14 (112)
	17:08	17:48	19:22						19:57				20:30		20:55	38	06:52 (112)
15	07:45	07:15	07:31				08:01 (115)	06:38					05:57		05:40		06:14 (112)
	17:09	17:49	19:23			5	08:06 (115)	19:58					20:31		20:56	38	06:52 (112)
16	07:44	07:14	07:29				07:56 (115)	06:36					05:56		05:40		06:15 (112)
	17:11	17:50	19:24			15	08:11 (115)	20:00					20:32		20:56	37	06:52 (112)
17	07:44	07:12	07:27				07:53 (115)	06:35					05:55		05:40		06:15 (112)
	17:12	17:52	19:26			20	08:13 (115)	20:00					20:33		20:56	37	06:52 (112)
18	07:43	07:11	07:26				07:51 (115)	06:33					05:54		05:40		06:15 (112)
	17:13	17:53	19:27			23	08:14 (115)	20:01					20:34		20:57	37	06:52 (112)
19	07:43	07:10	07:24				07:49 (115)	06:31					05:53		06:25 (112)	05:40	06:15 (112)
	17:14	17:54	19:28			26	08:15 (115)	20:02					20:35	8	06:33 (112)	20:57	06:52 (112)
20	07:42	07:08	07:22				07:48 (115)	06:30					05:52		06:22 (112)	05:40	06:15 (112)
	17:15	17:55	19:29			29	08:17 (115)	20:03					20:36	14	06:36 (112)	20:57	06:52 (112)
21	07:41	07:07	07:20				07:47 (115)	06:28					05:51		06:20 (112)	05:40	06:15 (112)
	17:17	17:57	19:30			30	08:17 (115)	20:04					20:37	18	06:38 (112)	20:58	06:52 (112)
22	07:41	07:05	07:19				07:46 (115)	06:27					05:50		06:19 (112)	05:41	06:16 (112)
	17:18	17:58	19:31			31	08:17 (115)	20:05					20:38	21	06:40 (112)	20:58	06:53 (112)
23	07:40	07:04	07:17				07:45 (115)	06:25					05:49		06:18 (112)	05:41	06:16 (112)
	17:19	17:59	19:32			32	08:17 (115)	20:06					20:39	23	06:41 (112)	20:58	06:53 (112)
24	07:39	07:02	07:15				07:45 (115)	06:24					05:49		06:17 (112)	05:41	06:16 (112)
	17:20	18:00	19:34			33	08:18 (115)	20:07					20:40	25	06:42 (112)	20:58	06:53 (112)
25	07:38	07:01	07:13				07:44 (115)	06:22					05:48		06:17 (112)	05:41	06:17 (112)
	17:22	18:02	19:35			33	08:17 (115)	20:09					20:41	26	06:43 (112)	20:58	06:54 (112)
26	07:38	06:59	07:12				07:44 (115)	06:21					05:47		06:16 (112)	05:42	06:17 (112)
	17:23	18:03	19:36			33	08:17 (115)	20:10					20:41	28	06:44 (112)	20:59	06:54 (112)
27	07:37	06:57	07:10				07:43 (115)	06:19					05:46		06:15 (112)	05:42	06:16 (112)
	17:24	18:04	19:37			33	08:16 (115)	20:11					20:42	29	06:44 (112)	20:59	06:54 (112)
28	07:36	06:56	07:08				07:44 (115)	06:18					05:46		06:15 (112)	05:42	06:17 (112)
	17:25	18:05	19:38			32	08:16 (115)	20:12					20:43	30	06:45 (112)	20:59	06:55 (112)
29	07:35		07:07				07:44 (115)	06:16					05:45		06:14 (112)	05:43	06:17 (112)
	17:27		19:39			31	08:15 (115)	20:13					20:44	31	06:45 (112)	20:59	06:54 (112)
30	07:34		07:05				07:44 (115)	06:15					05:45		06:14 (112)	05:43	06:18 (112)
	17:28		19:40			29	08:13 (115)	20:14					20:45	33	06:47 (112)	20:59	06:55 (112)
31	07:33		07:03				07:44 (115)						05:44		06:14 (112)		
	17:29		19:42			28	08:12 (115)						20:46	33	06:47 (112)		
Potential sun hours	294	295	370					401					452		457		
Total, worst case						463			79				319			1100	
Sun reduction						0.46			0.51				0.56			0.65	
Oper. time red.						1.00			1.00				1.00			1.00	
Wind dir. red.						0.61			0.61				0.68			0.68	
Total reduction						0.28			0.31				0.38			0.44	
Total, real						129			24				121			485	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

2015-08-31_Arkwright Summit_SFA

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Licensed user:

EDR

217 Montgomery St.

US-SYRACUSE, NY 13202

(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 213 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1375)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

July		August		September		October		November		December	
1	05:44	06:18 (112)	06:09	06:42		07:14	06:50	07:27			
2	05:44	06:18 (112)	06:10	06:43		07:15	06:51	07:28			
3	05:45	06:18 (112)	06:11	06:44		07:16	06:53	07:29			
4	05:45	06:19 (112)	06:12	06:45		07:17	06:54	07:30			
5	05:46	06:19 (112)	06:13	06:46		07:18	06:55	07:31			
6	05:47	06:19 (112)	06:14	06:47		07:19	06:56	07:32			
7	05:47	06:19 (112)	06:15	06:48		07:20	06:58	07:33			
8	05:48	06:20 (112)	06:16	06:49		07:22	06:59	07:34			
9	05:49	06:20 (112)	06:17	06:50	13	07:23	07:00	07:34			
10	05:49	06:20 (112)	06:18	06:51	19	07:24	07:01	07:35			
11	05:50	06:21 (112)	06:19	06:52	22	07:25	07:03	07:36			
12	05:51	06:22 (112)	06:21	06:53	25	07:26	07:04	07:37			
13	05:52	06:22 (112)	06:22	06:54	27	07:27	07:05	07:38			
14	05:52	06:22 (112)	06:23	06:56	30	07:28	07:06	07:39			
15	05:53	06:23 (112)	06:24	06:57	31	07:30	07:08	07:39			
16	05:54	06:24 (112)	06:25	06:58	32	07:31	07:09	07:40			
17	05:55	06:25 (112)	06:26	06:59	32	07:32	07:10	07:41			
18	05:56	06:26 (112)	06:27	07:00	33	07:33	07:11	07:41			
19	05:57	06:27 (112)	06:28	07:01	33	07:34	07:13	07:42			
20	05:58	06:27 (112)	06:29	07:02	33	07:35	07:14	07:43			
21	05:58	06:28 (112)	06:30	07:03	32	07:36	07:15	07:43			
22	05:59	06:30 (112)	06:31	07:04	32	07:37	07:16	07:44			
23	06:00	06:31 (112)	06:32	07:05	29	07:38	07:17	07:44			
24	06:01	06:34 (112)	06:33	07:06	27	07:39	07:19	07:45			
25	06:02	06:34 (112)	06:34	07:07	24	07:40	07:20	07:45			
26	06:03	06:35 (112)	06:35	07:08	21	07:41	07:21	07:46			
27	06:04	06:36 (112)	06:36	07:09	17	07:42	07:22	07:46			
28	06:05	06:37 (112)	06:37	07:10	10	07:43	07:23	07:46			
29	06:06	06:38 (112)	06:38	07:11		07:44	07:24	07:46			
30	06:07	06:39 (112)	06:39	07:12		07:45	07:25	07:47			
31	06:08	06:40 (112)	06:40	07:13		07:46	07:26	07:47			
Potential sun hours	464		431	375		343	294	283			
Total, worst case	727			553							
Sun reduction	0.67			0.57							
Oper. time red.	1.00			1.00							
Wind dir. red.	0.68			0.61							
Total reduction	0.45			0.34							
Total, real	330			191							

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)

Project:

2015-08-31_Arkwright Summit_SFA

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Licensed user:

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Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 221 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1383)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

January		February		March		April		May		June	
1	07:47	14:10 (97)	07:32	15:59 (96)	06:54		07:01	06:13	05:43		
	16:55	33	14:43 (97)	17:30	25	16:24 (96)	18:06	19:42	20:15	20:46	
2	07:47		14:11 (97)	07:31		15:58 (96)	06:52	06:59	06:12	05:43	
	16:56	32	14:43 (97)	17:32	28	16:26 (96)	18:08	19:44	20:16	20:47	
3	07:47		14:12 (97)	07:30		15:56 (96)	06:51	06:58	06:11	05:42	
	16:57	31	14:43 (97)	17:33	30	16:26 (96)	18:09	19:45	20:17	20:48	
4	07:47		14:13 (97)	07:29		15:56 (96)	06:49	06:56	06:09	05:42	
	16:58	30	14:43 (97)	17:34	31	16:27 (96)	18:10	19:46	20:18	20:49	
5	07:47		14:14 (97)	07:27		15:55 (96)	06:47	17:10 (95)	06:54	06:08	05:42
	16:58	29	14:43 (97)	17:36	33	16:28 (96)	18:11	17:22 (95)	19:47	20:19	20:49
6	07:47		14:15 (97)	07:26		15:55 (96)	06:46	17:07 (95)	06:53	06:07	05:41
	16:59	28	14:43 (97)	17:37	34	16:29 (96)	18:12	17:24 (95)	19:48	20:21	20:50
7	07:47		14:16 (97)	07:25		15:55 (96)	06:44	17:05 (95)	06:51	06:06	05:41
	17:00	26	14:42 (97)	17:38	35	16:30 (96)	18:14	17:26 (95)	19:49	20:22	20:51
8	07:47		14:17 (97)	07:24		15:54 (96)	07:42	18:04 (95)	06:49	06:04	05:41
	17:01	24	14:41 (97)	17:40	36	16:30 (96)	19:15	18:27 (95)	19:50	20:23	20:51
9	07:46		14:19 (97)	07:23		15:54 (96)	07:41	18:02 (95)	06:47	06:03	05:40
	17:03	22	14:41 (97)	17:41	36	16:30 (96)	19:16	18:27 (95)	19:51	20:24	20:52
10	07:46		14:21 (97)	07:21		15:54 (96)	07:39	18:02 (95)	06:46	06:02	05:40
	17:04	20	14:41 (97)	17:42	37	16:31 (96)	19:17	18:29 (95)	19:53	20:25	20:53
11	07:46		14:22 (97)	07:20		15:55 (96)	07:37	18:01 (95)	06:44	06:01	05:40
	17:05	17	14:39 (97)	17:44	36	16:31 (96)	19:18	18:29 (95)	19:54	20:26	20:53
12	07:46		14:25 (97)	07:19		15:54 (96)	07:36	18:00 (95)	06:42	06:00	05:40
	17:06	13	14:38 (97)	17:45	37	16:31 (96)	19:19	18:28 (95)	19:55	20:27	20:54
13	07:45		14:29 (97)	07:18		15:55 (96)	07:34	18:00 (95)	06:41	05:59	05:40
	17:07	4	14:33 (97)	17:46	36	16:31 (96)	19:21	18:29 (95)	19:56	20:28	20:54
14	07:45			07:16		15:54 (96)	07:32	18:00 (95)	06:39	05:58	05:40
	17:08			17:47	36	16:30 (96)	19:22	18:28 (95)	19:57	20:29	20:55
15	07:44			07:15		15:55 (96)	07:31	18:00 (95)	06:38	05:57	05:40
	17:09			17:49	35	16:30 (96)	19:23	18:28 (95)	19:58	20:30	20:55
16	07:44			07:13		15:56 (96)	07:29	18:00 (95)	06:36	05:56	05:40
	17:10			17:50	34	16:30 (96)	19:24	18:27 (95)	19:59	20:31	20:56
17	07:43			07:12		15:56 (96)	07:27	18:01 (95)	06:34	05:55	05:40
	17:12			17:51	33	16:29 (96)	19:25	18:26 (95)	20:00	20:32	20:56
18	07:43			07:11		15:57 (96)	07:25	18:01 (95)	06:33	05:54	05:40
	17:13			17:53	32	16:29 (96)	19:26	18:25 (95)	20:00	20:33	20:56
19	07:42			07:09		15:58 (96)	07:24	18:02 (95)	06:31	05:53	05:40
	17:14			17:54	29	16:27 (96)	19:28	18:23 (95)	20:02	20:34	20:57
20	07:42			07:08		16:00 (96)	07:22	18:03 (95)	06:30	05:52	05:40
	17:15			17:55	26	16:26 (96)	19:29	18:21 (95)	20:03	20:35	20:57
21	07:41			07:06		16:01 (96)	07:20	18:06 (95)	06:28	05:51	05:40
	17:16			17:56	23	16:24 (96)	19:30	18:20 (95)	20:04	20:36	20:57
22	07:40			07:05		16:03 (96)	07:18	18:09 (95)	06:27	05:50	05:40
	17:18			17:58	20	16:23 (96)	19:31	18:15 (95)	20:05	20:37	20:58
23	07:40			07:03		16:06 (96)	07:17		06:25	05:49	05:41
	17:19			17:59	14	16:20 (96)	19:32		20:06	20:38	20:58
24	07:39			07:02			07:15		06:24	05:48	05:41
	17:20			18:00			19:33		20:07	20:39	20:58
25	07:38			07:00			07:13		06:22	05:48	05:41
	17:21			18:01			19:34		20:08	20:40	20:58
26	07:37			06:59			07:11		06:21	05:47	05:42
	17:23			18:03			19:36		20:09	20:41	20:58
27	07:36			06:57			07:10		06:19	05:46	05:42
	17:24			18:04			19:37		20:11	20:42	20:58
28	07:36		16:06 (96)	06:56			07:08		06:18	05:46	05:42
	17:25	9	16:15 (96)	18:05			19:38		20:12	20:43	20:58
29	07:35		16:03 (96)				07:06		06:16	05:45	05:43
	17:27	16	16:19 (96)				19:39		20:13	20:44	20:58
30	07:34		16:01 (96)				07:05		06:15	05:44	05:43
	17:28	20	16:21 (96)				19:40		20:14	20:45	20:58
31	07:33		16:00 (96)				07:03			05:44	
	17:29	23	16:23 (96)				19:41			20:45	
Potential sun hours	294		295			370		401	452	457	
Total, worst case		377		716		401					
Sun reduction		0.31		0.38		0.46					
Oper. time red.		1.00		1.00		1.00					
Wind dir. red.		0.70		0.69		0.65					
Total reduction		0.22		0.27		0.30					
Total, real		83		190		121					

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker		(WTG causing flicker first time)	
	Sun set (hh:mm)		Last time (hh:mm) with flicker		(WTG causing flicker last time)	

Project:

2015-08-31_Arkwright Summit_SFA

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Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 221 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1383)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

July		August		September		October		November		December	
1	05:44	06:09	06:42			07:14		17:40 (95)	06:50	15:24 (96)	07:26
	20:58	20:39	19:53			19:00	28	18:08 (95)	17:12	16:01 (96)	16:46
2	05:44	06:10	06:43			07:15		17:39 (95)	06:51	15:24 (96)	07:27
	20:58	20:38	19:51			18:58	28	18:07 (95)	17:10	16:00 (96)	16:46
3	05:45	06:11	06:44			07:16		17:39 (95)	06:52	15:24 (96)	07:28
	20:58	20:37	19:49			18:57	27	18:06 (95)	17:09	15:59 (96)	16:45
4	05:45	06:12	06:45			07:17		17:39 (95)	06:54	15:25 (96)	07:29
	20:58	20:35	19:47			18:55	26	18:05 (95)	17:08	16:00 (96)	16:45
5	05:46	06:13	06:46			07:18		17:40 (95)	06:55	15:25 (96)	07:30
	20:58	20:34	19:46			18:53	24	18:04 (95)	17:07	15:59 (96)	16:45
6	05:47	06:14	06:47			07:19		17:40 (95)	06:56	15:25 (96)	07:31
	20:57	20:33	19:44			18:51	22	18:02 (95)	17:05	15:58 (96)	16:45
7	05:47	06:15	06:48			07:20		17:43 (95)	06:57	15:27 (96)	07:32
	20:57	20:32	19:42			18:50	19	18:02 (95)	17:04	15:58 (96)	16:45
8	05:48	06:16	06:49			07:21		17:44 (95)	06:59	15:27 (96)	07:33
	20:57	20:30	19:41			18:48	15	17:59 (95)	17:03	15:57 (96)	16:45
9	05:49	06:17	06:50			07:22		17:47 (95)	07:00	15:28 (96)	07:34
	20:56	20:29	19:39			18:46	8	17:55 (95)	17:02	15:56 (96)	16:45
10	05:49	06:18	06:51			07:24			07:01	15:30 (96)	07:35
	20:56	20:28	19:37			18:45			17:01	15:55 (96)	16:45
11	05:50	06:19	06:52			07:25			07:02	15:31 (96)	07:36
	20:56	20:26	19:35			18:43			17:00	15:54 (96)	16:45
12	05:51	06:20	06:53			07:26			07:04	15:32 (96)	07:37
	20:55	20:25	19:34			18:41			16:59	15:52 (96)	16:45
13	05:51	06:21	06:54			07:27			07:05	15:35 (96)	07:38
	20:55	20:24	19:32			18:40			16:58	15:51 (96)	16:45
14	05:52	06:22	06:55			07:28			07:06	15:38 (96)	07:38
	20:54	20:22	19:30			18:38			16:57	9	15:47 (96)
15	05:53	06:24	06:56			07:29			07:07		07:39
	20:53	20:21	19:28			18:36			16:56		16:45
16	05:54	06:25	06:57			07:30			07:09		07:40
	20:53	20:19	19:27			18:35			16:55		16:45
17	05:55	06:26	06:58			07:32			07:10		07:40
	20:52	20:18	19:25			18:33			16:54		16:46
18	05:56	06:27	07:00			07:33		16:40 (96)	07:11		07:41
	20:52	20:17	19:23			18:32	9	16:49 (96)	16:53		16:46
19	05:56	06:28	07:01			07:34		16:36 (96)	07:12		07:42
	20:51	20:15	19:21			18:30	16	16:52 (96)	16:53		16:46
20	05:57	06:29	07:02			07:35		16:33 (96)	07:13		07:42
	20:50	20:13	19:19			18:29	21	16:54 (96)	16:52		16:47
21	05:58	06:30	07:03			07:36		16:31 (96)	07:15		07:43
	20:49	20:12	19:18			18:27	24	16:55 (96)	16:51		16:47
22	05:59	06:31	07:04		17:51 (95)	07:38		16:30 (96)	07:16		07:43
	20:48	20:10	19:16	12	18:03 (95)	18:26	27	16:57 (96)	16:50		16:48
23	06:00	06:32	07:05		17:48 (95)	07:39		16:28 (96)	07:17		07:44
	20:48	20:09	19:14	17	18:05 (95)	18:24	30	16:58 (96)	16:50		16:48
24	06:01	06:33	07:06		17:46 (95)	07:40		16:27 (96)	07:18		07:44
	20:47	20:07	19:12	20	18:06 (95)	18:23	32	16:59 (96)	16:49		16:49
25	06:02	06:34	07:07		17:44 (95)	07:41		16:26 (96)	07:19		07:45
	20:46	20:06	19:11	23	18:07 (95)	18:21	33	16:59 (96)	16:49		16:49
26	06:03	06:35	07:08		17:43 (95)	07:42		16:26 (96)	07:21		07:45
	20:45	20:04	19:09	25	18:08 (95)	18:20	34	17:00 (96)	16:48		16:50
27	06:04	06:36	07:09		17:41 (95)	07:44		16:25 (96)	07:22		07:45
	20:44	20:02	19:07	27	18:08 (95)	18:18	35	17:00 (96)	16:47		16:51
28	06:05	06:37	07:10		17:40 (95)	07:45		16:24 (96)	07:23		07:46
	20:43	20:01	19:05	28	18:08 (95)	18:17	36	17:00 (96)	16:47		16:51
29	06:06	06:38	07:11		17:41 (95)	07:46		16:24 (96)	07:24	14:11 (97)	07:46
	20:42	19:58	19:04	28	18:09 (95)	18:16	37	17:01 (96)	16:47	3	14:14 (97)
30	06:07	06:39	07:12		17:40 (95)	07:47		16:24 (96)	07:25		14:07 (97)
	20:41	19:56	19:02	28	18:08 (95)	18:14	36	17:00 (96)	16:46	11	14:18 (97)
31	06:08	06:41				07:49		16:23 (96)			07:46
	20:40	19:54				18:13	37	17:00 (96)			16:54
Potential sun hours	463	431	375			343		294			283
Total, worst case			208			604		406			990
Sun reduction			0.57			0.50		0.29			0.27
Oper. time red.			1.00			1.00		1.00			1.00
Wind dir. red.			0.65			0.68		0.69			0.71
Total reduction			0.37			0.34		0.20			0.19
Total, real			78			207		82			190

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

2015-08-31_Arkwright Summit_SFA

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Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 224 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1384)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

January	February	March	April	May	June
1 07:47 07:32 06:54 16:52 (15) 07:01 06:14 18:55 (10) 05:43					
16:55 17:31 18:06 8 17:00 (15) 19:42 20:15 19:09 (10) 20:46					
2 07:47 07:31 06:52 06:59 06:12 18:58 (10) 05:43					
16:56 17:32 18:08 19:44 20:16 19:04 (10) 20:47					
3 07:47 07:30 06:51 06:58 06:11 19:04 (10) 05:42					
16:57 17:33 18:09 19:45 20:17 19:04 (10) 20:48					
4 07:47 07:29 06:49 06:56 06:10 19:04 (10) 20:48					
16:58 17:34 18:10 19:46 20:18 19:04 (10) 20:49					
5 07:47 07:28 06:48 06:54 06:08 19:04 (10) 20:49					
16:59 17:36 18:11 19:47 20:20 19:04 (10) 20:49					
6 07:47 07:26 06:46 06:53 06:07 19:04 (10) 20:49					
17:00 17:37 18:12 19:48 20:21 19:04 (10) 20:50					
7 07:47 07:25 06:44 06:51 19:02 (10) 06:06 20:51					
17:01 17:38 18:14 19:49 19:12 (10) 20:22 20:51					
8 07:47 07:24 06:43 06:49 18:58 (10) 06:04 20:51					
17:02 17:40 19:15 19:50 19:16 (10) 20:23 20:52					
9 07:46 07:23 06:41 06:48 18:55 (10) 06:03 20:52					
17:03 17:41 19:16 19:51 19:17 (10) 20:24 20:52					
10 07:46 07:22 06:39 06:46 18:53 (10) 06:02 20:52					
17:04 17:42 19:17 19:53 19:18 (10) 20:25 20:53					
11 07:46 07:20 06:37 06:44 18:52 (10) 06:01 20:53					
17:05 17:44 19:18 19:54 19:20 (10) 20:26 20:53					
12 07:46 07:19 16:53 (15) 06:43 18:50 (10) 06:00 20:54					
17:06 17:45 8 17:01 (15) 19:20 19:55 19:20 (10) 20:27 20:54					
13 07:45 07:18 16:50 (15) 06:41 18:49 (10) 05:59 20:54					
17:07 17:46 14 17:04 (15) 19:21 19:56 19:21 (10) 20:28 20:54					
14 07:45 07:16 16:49 (15) 06:39 18:49 (10) 05:58 20:54					
17:08 17:48 17 17:06 (15) 19:22 19:57 19:22 (10) 20:29 20:55					
15 07:44 07:15 16:47 (15) 06:38 18:47 (10) 05:57 20:54					
17:09 17:49 20 17:07 (15) 19:23 19:58 19:22 (10) 20:30 20:55					
16 07:44 07:14 16:46 (15) 06:36 18:46 (10) 05:56 20:54					
17:10 17:50 23 17:09 (15) 19:24 19:59 19:21 (10) 20:31 20:56					
17 07:44 07:12 16:45 (15) 06:34 18:46 (10) 05:55 20:54					
17:12 17:51 24 17:09 (15) 19:25 20:01 19:22 (10) 20:32 20:56					
18 07:43 07:11 16:45 (15) 06:33 18:46 (10) 05:54 20:54					
17:13 17:53 25 17:10 (15) 19:27 20:01 19:21 (10) 20:33 20:57					
19 07:42 07:09 16:44 (15) 06:31 18:46 (10) 05:53 20:54					
17:14 17:54 26 17:10 (15) 19:28 20:02 19:22 (10) 20:34 20:57					
20 07:42 07:08 16:44 (15) 06:30 18:45 (10) 05:52 20:54					
17:15 17:55 26 17:10 (15) 19:29 20:03 19:21 (10) 20:36 20:57					
21 07:41 07:06 16:43 (15) 06:28 18:46 (10) 05:51 20:54					
17:16 17:56 27 17:10 (15) 19:30 20:04 19:21 (10) 20:36 20:57					
22 07:40 07:05 16:44 (15) 06:27 18:46 (10) 05:50 20:54					
17:18 17:58 26 17:10 (15) 19:31 20:05 19:20 (10) 20:37 20:58					
23 07:40 07:03 16:44 (15) 06:25 18:46 (10) 05:49 20:54					
17:19 17:59 25 17:09 (15) 19:32 20:06 19:20 (10) 20:38 20:58					
24 07:39 07:02 16:45 (15) 06:24 18:46 (10) 05:48 20:54					
17:20 18:00 24 17:09 (15) 19:33 20:07 19:19 (10) 20:39 20:58					
25 07:38 07:00 16:45 (15) 06:22 18:47 (10) 05:48 20:54					
17:21 18:01 23 17:08 (15) 19:35 20:08 19:18 (10) 20:40 20:58					
26 07:37 06:59 16:46 (15) 06:21 18:47 (10) 05:47 20:54					
17:23 18:03 21 17:07 (15) 19:36 20:10 19:17 (10) 20:41 20:58					
27 07:37 06:57 16:47 (15) 06:19 18:48 (10) 05:46 20:54					
17:24 18:04 18 17:05 (15) 19:37 20:11 19:16 (10) 20:42 20:58					
28 07:36 06:56 16:49 (15) 06:18 18:50 (10) 05:46 20:54					
17:25 18:05 14 17:03 (15) 19:38 20:12 19:15 (10) 20:43 20:58					
29 07:35 06:55 16:49 (15) 06:16 18:51 (10) 05:45 20:54					
17:27 18:06 15 17:04 (15) 19:39 20:13 19:13 (10) 20:44 20:58					
30 07:34 06:54 16:49 (15) 06:15 18:53 (10) 05:44 20:54					
17:28 18:07 16 17:05 (15) 19:40 20:14 19:11 (10) 20:45 20:58					
31 07:33 06:53 16:49 (15) 06:14 18:54 (10) 05:44 20:54					
17:29 18:08 17 17:06 (15) 19:41 20:15 19:12 (10) 20:46 20:58					
Potential sun hours 294 295 370 401 452 457					
Total, worst case 361 361 361 361 361 361					
Sun reduction 0.38 0.38 0.38 0.38 0.38 0.38					
Oper. time red. 1.00 1.00 1.00 1.00 1.00 1.00					
Wind dir. red. 0.68 0.68 0.68 0.68 0.68 0.68					
Total reduction 0.26 0.26 0.26 0.26 0.26 0.26					
Total, real 94 94 94 94 94 94					

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
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Project:

2015-08-31_Arkwright Summit_SFA

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US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 224 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1384)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	05:44	06:09	06:42	18:51 (10) 07:14	06:50	07:26
2	05:44	06:10	06:43	18:52 (10) 07:15	06:51	07:27
3	05:45	06:11	06:44	18:53 (10) 07:16	06:52	07:28
4	05:45	06:12	06:45	18:55 (10) 07:17	06:54	07:29
5	05:46	06:13	06:46	18:58 (10) 07:18	06:55	07:30
6	05:47	06:14	06:47	19:09 (10) 07:19	06:56	07:31
7	05:47	06:15	06:48	18:52	06:57	07:32
8	05:48	06:16	06:49	18:50	06:59	07:33
9	05:49	06:17	06:50	18:48	07:00	07:34
10	05:49	06:18	06:51	18:46	07:01	07:35
11	05:50	06:19	19:05 (10) 06:52	18:45	07:02	07:36
12	05:51	06:20	19:02 (10) 06:53	18:43	07:04	07:37
13	05:52	06:21	19:00 (10) 06:54	18:41	16:59	07:38
14	05:52	06:23	18:58 (10) 06:55	17:24 (15) 07:05	17:35 (15) 16:58	07:38
15	05:53	06:24	18:56 (10) 06:56	17:21 (15) 07:06	17:37 (15) 16:57	07:39
16	05:54	06:25	18:55 (10) 06:57	17:19 (15) 07:07	17:38 (15) 16:56	07:40
17	05:55	06:26	18:54 (10) 06:59	17:18 (15) 07:09	17:39 (15) 16:55	07:41
18	05:56	06:27	18:53 (10) 07:00	17:16 (15) 07:10	17:40 (15) 16:54	07:41
19	05:57	06:28	18:52 (10) 07:01	17:15 (15) 07:11	17:41 (15) 16:53	07:42
20	05:57	06:29	18:52 (10) 07:02	17:15 (15) 07:12	17:41 (15) 16:53	07:42
21	05:58	06:30	18:51 (10) 07:03	17:15 (15) 07:14	17:41 (15) 16:52	07:43
22	05:59	06:31	18:51 (10) 07:04	17:14 (15) 07:15	17:41 (15) 16:51	07:44
23	06:00	06:32	18:50 (10) 07:05	17:14 (15) 07:16	17:41 (15) 16:50	07:44
24	06:01	06:33	18:50 (10) 07:06	17:14 (15) 07:17	17:41 (15) 16:50	07:44
25	06:02	06:34	18:50 (10) 07:07	17:14 (15) 07:18	17:41 (15) 16:49	07:45
26	06:03	06:35	18:49 (10) 07:08	17:13 (15) 07:19	17:41 (15) 16:49	07:45
27	06:04	06:36	18:49 (10) 07:09	17:13 (15) 07:20	17:41 (15) 16:48	07:46
28	06:05	06:37	18:49 (10) 07:10	17:12 (15) 07:21	17:41 (15) 16:48	07:46
29	06:06	06:38	18:49 (10) 07:11	17:12 (15) 07:22	17:41 (15) 16:47	07:46
30	06:07	06:40	18:50 (10) 07:13	17:11 (15) 07:23	17:41 (15) 16:46	07:46
31	06:08	06:41	18:50 (10) 07:14	17:11 (15) 07:24	17:41 (15) 16:46	07:47
Potential sun hours	463	431	375	343	294	283
Total, worst case		627	104	373		
Sun reduction		0.64	0.57	0.50		
Oper. time red.		1.00	1.00	1.00		
Wind dir. red.		0.60	0.60	0.68		
Total reduction		0.39	0.35	0.34		
Total, real		244	36	127		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

2015-08-31_Arkwright Summit_SFA

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Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 225 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1385)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June
1	07:47	07:32	06:54	07:01	06:14	19:09 (105) 05:43
	16:55	17:31	18:06	19:42	20:15	31 19:40 (105) 20:46
2	07:47	07:31	06:52	06:59	06:12	19:07 (105) 05:43
	16:56	17:32	18:08	19:44	20:16	33 19:40 (105) 20:47
3	07:47	07:30	06:51	06:58	06:11	19:07 (105) 05:42
	16:57	17:33	18:09	19:45	20:17	33 19:40 (105) 20:48
4	07:47	07:29	06:49	06:56	06:10	19:07 (105) 05:42
	16:58	17:34	18:10	19:46	20:18	34 19:41 (105) 20:49
5	07:47	07:28	06:48	06:54	06:08	19:07 (105) 05:42
	16:59	17:36	18:11	19:47	20:20	34 19:41 (105) 20:49
6	07:47	07:26	06:46	06:53	06:07	19:06 (105) 05:41
	16:59	17:37	18:12	19:48	20:21	35 19:41 (105) 20:50
7	07:47	07:25	06:44	06:51	06:06	19:06 (105) 05:41
	17:00	17:38	18:14	19:49	20:22	35 19:41 (105) 20:51
8	07:47	07:24	07:43	06:49	06:04	19:06 (105) 05:41
	17:02	17:40	19:15	19:50	20:23	35 19:41 (105) 20:52
9	07:46	07:23	07:41	18:26 (10) 06:48	06:03	19:06 (105) 05:40
	17:03	17:41	19:16	11 18:37 (10) 19:51	20:24	35 19:41 (105) 20:52
10	07:46	07:22	07:39	18:23 (10) 06:46	06:02	19:07 (105) 05:40
	17:04	17:42	19:17	17 18:40 (10) 19:53	20:25	34 19:41 (105) 20:53
11	07:46	07:20	07:37	18:21 (10) 06:44	06:01	19:07 (105) 05:40
	17:05	17:44	19:18	20 18:41 (10) 19:54	20:26	34 19:41 (105) 20:53
12	07:46	07:19	07:36	18:19 (10) 06:43	06:00	19:07 (105) 05:40
	17:06	17:45	19:20	23 18:42 (10) 19:55	20:27	33 19:40 (105) 20:54
13	07:45	07:18	07:34	18:18 (10) 06:41	05:59	19:08 (105) 05:40
	17:07	17:46	19:21	26 18:44 (10) 19:56	20:28	32 19:40 (105) 20:54
14	07:45	07:16	07:32	18:17 (10) 06:39	05:58	19:08 (105) 05:40
	17:08	17:48	19:22	27 18:44 (10) 19:57	20:29	32 19:40 (105) 20:55
15	07:44	07:15	07:31	18:16 (10) 06:38	05:57	19:08 (105) 05:40
	17:09	17:49	19:23	28 18:44 (10) 19:58	20:30	31 19:39 (105) 20:55
16	07:44	07:14	07:29	18:15 (10) 06:36	05:56	19:09 (105) 05:40
	17:10	17:50	19:24	29 18:44 (10) 19:59	20:31	30 19:39 (105) 20:56
17	07:44	07:12	07:27	18:15 (10) 06:34	05:55	19:10 (105) 05:40
	17:12	17:51	19:25	30 18:45 (10) 20:01	20:32	28 19:38 (105) 20:56
18	07:43	07:11	07:25	18:15 (10) 06:33	05:54	19:10 (105) 05:40
	17:13	17:53	19:27	29 18:44 (10) 20:01	20:33	27 19:37 (105) 20:57
19	07:42	07:09	07:24	18:15 (10) 06:31	05:53	19:11 (105) 05:40
	17:14	17:54	19:28	28 18:43 (10) 20:02	20:34	25 19:36 (105) 20:57
20	07:42	07:08	07:22	18:14 (10) 06:30	05:52	19:12 (105) 05:40
	17:15	17:55	19:29	28 18:42 (10) 20:03	20:35	23 19:35 (105) 20:57
21	07:41	07:06	07:20	18:16 (10) 06:28	05:51	19:13 (105) 05:40
	17:16	17:56	19:30	26 18:42 (10) 20:04	20:36	21 19:34 (105) 20:57
22	07:40	07:05	07:19	18:16 (10) 06:27	05:50	19:15 (105) 05:40
	17:18	17:58	19:31	25 18:41 (10) 20:05	20:37	19 19:34 (105) 20:58
23	07:40	07:03	07:17	18:16 (10) 06:25	05:49	19:16 (105) 05:41
	17:19	17:59	19:32	23 18:39 (10) 20:06	20:38	17 19:33 (105) 20:58
24	07:39	07:02	07:15	18:17 (10) 06:24	19:21 (105) 05:48	19:17 (105) 05:41
	17:20	18:00	19:33	20 18:37 (10) 20:07	8 19:29 (105) 20:39	14 19:31 (105) 20:58
25	07:38	07:00	07:13	18:19 (10) 06:22	19:17 (105) 05:48	19:19 (105) 05:41
	17:21	18:01	19:35	17 18:36 (10) 20:08	16 19:33 (105) 20:40	9 19:28 (105) 20:58
26	07:37	06:59	07:12	18:22 (10) 06:21	19:14 (105) 05:47	05:42
	17:23	18:03	19:36	11 18:33 (10) 20:10	20 19:34 (105) 20:41	20:58
27	07:37	06:57	07:10	06:19	19:13 (105) 05:46	05:42
	17:24	18:04	19:37	20:11	23 19:36 (105) 20:42	20:58
28	07:36	06:56	07:08	06:18	19:12 (105) 05:46	05:42
	17:25	18:05	19:38	20:12	26 19:38 (105) 20:43	20:58
29	07:35		07:06	06:16	19:10 (105) 05:45	05:43
	17:27		19:39	20:13	28 19:38 (105) 20:44	20:58
30	07:34		07:05	06:15	19:09 (105) 05:44	05:43
	17:28		19:40	20:14	30 19:39 (105) 20:45	20:58
31	07:33		07:03		05:44	
	17:29		19:41		20:46	
Potential sun hours	294	295	370	401	452	457
Total, worst case			418	151	714	
Sun reduction			0.46	0.51	0.56	
Oper. time red.			1.00	1.00	1.00	
Wind dir. red.			0.63	0.58	0.58	
Total reduction			0.29	0.30	0.33	
Total, real			122	45	234	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 101

Licensed user:

EDR

217 Montgomery St.

US-SYRACUSE, NY 13202

(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 225 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1385)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	July		August		September		October		November		December	
1	05:44		06:09		19:17 (105)	06:42		07:14		17:58 (10)	06:50	07:26
	20:58		20:39	33	19:50 (105)	19:53		19:00	24	18:22 (10)	17:12	16:46
2	05:44		06:10		19:16 (105)	06:43		07:15		17:59 (10)	06:51	07:27
	20:58		20:38	34	19:50 (105)	19:51		18:58	22	18:21 (10)	17:10	16:46
3	05:45		06:11		19:16 (105)	06:44		07:16		18:00 (10)	06:52	07:28
	20:58		20:37	35	19:51 (105)	19:49		18:57	19	18:19 (10)	17:09	16:45
4	05:45		06:12		19:16 (105)	06:45		07:17		18:02 (10)	06:54	07:29
	20:58		20:35	35	19:51 (105)	19:48		18:55	14	18:16 (10)	17:08	16:45
5	05:46		06:13		19:16 (105)	06:46		07:18		18:05 (10)	06:55	07:30
	20:58		20:34	35	19:51 (105)	19:46		18:53	7	18:12 (10)	17:07	16:45
6	05:47		06:14		19:16 (105)	06:47		07:19			06:56	07:31
	20:57		20:33	34	19:50 (105)	19:44		18:51			17:05	16:45
7	05:47		06:15		19:16 (105)	06:48		07:20			06:57	07:32
	20:57		20:32	34	19:50 (105)	19:42		18:50			17:04	16:45
8	05:48		06:16		19:16 (105)	06:49		07:21			06:59	07:33
	20:57		20:30	34	19:50 (105)	19:41		18:48			17:03	16:45
9	05:49		06:17		19:16 (105)	06:50		07:22			07:00	07:34
	20:56		20:29	33	19:49 (105)	19:39		18:46			17:02	16:45
10	05:49		06:18		19:16 (105)	06:51		07:24			07:01	07:35
	20:56		20:28	33	19:49 (105)	19:37		18:45			17:01	16:45
11	05:50		06:19		19:16 (105)	06:52		07:25			07:02	07:36
	20:56		20:27	32	19:48 (105)	19:35		18:43			17:00	16:45
12	05:51		06:20		19:17 (105)	06:53		07:26			07:04	07:37
	20:55		20:25	31	19:48 (105)	19:34		18:41			16:59	16:45
13	05:52		06:21		19:17 (105)	06:54		07:27			07:05	07:38
	20:55		20:24	30	19:47 (105)	19:32		18:40			16:58	16:45
14	05:52		06:23		19:18 (105)	06:55		07:28			07:06	07:38
	20:54		20:22	28	19:46 (105)	19:30		18:38			16:57	16:45
15	05:53		06:24		19:19 (105)	06:56		07:29			07:07	07:39
	20:54		20:21	25	19:44 (105)	19:28		18:37			16:56	16:45
16	05:54		06:25		19:20 (105)	06:57		07:31			07:09	07:40
	20:53		20:20	23	19:43 (105)	19:27		18:35			16:55	16:45
17	05:55		06:26		19:22 (105)	06:59		18:11 (10)	9	18:11 (10)	07:32	
	20:52		20:18	19	19:41 (105)	19:25		18:20 (10)		18:20 (10)	18:33	
18	05:56		19:31 (105)	06:27	19:24 (105)	07:00		18:07 (10)		18:07 (10)	07:33	
	20:52	6	19:37 (105)	20:17	14	19:38 (105)	19:23	16	18:23 (10)	18:32		
19	05:57		19:28 (105)	06:28	19:28 (105)	07:01		18:05 (10)		18:05 (10)	07:34	
	20:51	11	19:39 (105)	20:15	5	19:33 (105)	19:21	19	18:24 (10)	18:30		
20	05:57		19:26 (105)	06:29			07:02	18:03 (10)		18:03 (10)	07:35	
	20:50	15	19:41 (105)	20:14			19:19	22	18:25 (10)	18:29		
21	05:58		19:25 (105)	06:30			07:03	18:01 (10)		18:01 (10)	07:36	
	20:49	18	19:43 (105)	20:12			19:18	25	18:26 (10)	18:27		
22	05:59		19:24 (105)	06:31			07:04	18:00 (10)		18:00 (10)	07:38	
	20:49	20	19:44 (105)	20:11			19:16	27	18:27 (10)	18:26		
23	06:00		19:23 (105)	06:32			07:05	17:59 (10)		17:59 (10)	07:39	
	20:48	22	19:45 (105)	20:09			19:14	28	18:27 (10)	18:24		
24	06:01		19:22 (105)	06:33			07:06	17:58 (10)		17:58 (10)	07:40	
	20:47	24	19:46 (105)	20:07			19:12	29	18:27 (10)	18:23		
25	06:02		19:21 (105)	06:34			07:07	17:57 (10)		17:57 (10)	07:41	
	20:46	26	19:47 (105)	20:06			19:11	29	18:26 (10)	18:21		
26	06:03		19:21 (105)	06:35			07:08	17:57 (10)		17:57 (10)	07:42	
	20:45	27	19:48 (105)	20:04			19:09	29	18:26 (10)	18:20		
27	06:04		19:20 (105)	06:36			07:09	17:57 (10)		17:57 (10)	07:44	
	20:44	29	19:49 (105)	20:03			19:07	28	18:25 (10)	18:18		
28	06:05		19:19 (105)	06:37			07:10	17:57 (10)		17:57 (10)	07:45	
	20:43	31	19:50 (105)	20:01			19:05	29	18:26 (10)	18:17		
29	06:06		19:18 (105)	06:38			07:11	17:57 (10)		17:57 (10)	07:46	
	20:42	31	19:49 (105)	19:58			19:04	28	18:25 (10)	18:16		
30	06:07		19:17 (105)	06:40			07:12	17:58 (10)		17:58 (10)	07:47	
	20:41	33	19:50 (105)	19:56			19:02	26	18:24 (10)	18:14		
31	06:08		19:17 (105)	06:41						07:49		
	20:40	33	19:50 (105)	19:54						18:13		
Potential sun hours	463		431			375		343		294		283
Total, worst case	326		547		344		86					
Sun reduction	0.67		0.64		0.57		0.50					
Oper. time red.	1.00		1.00		1.00		1.00					
Wind dir. red.	0.58		0.58		0.63		0.63					
Total reduction	0.39		0.37		0.36		0.32					
Total, real	128		205		125		27					

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 102

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 226 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1386)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June						
1	07:47	07:32	16:19 (10)	06:54	07:01	18:11 (105)	06:14	05:43				
	16:55	17:31	22	16:41 (10)	18:06	19:42	42	18:53 (105)	20:15	20:46		
2	07:47	07:31		16:18 (10)	06:52			18:11 (105)	06:12	05:43		
	16:56	17:32	25	16:43 (10)	18:08	19:44	43	18:54 (105)	20:16	20:47		
3	07:47	07:30		16:17 (10)	06:51			18:09 (105)	06:11	05:42		
	16:57	17:33	27	16:44 (10)	18:09	19:45	46	18:55 (105)	20:17	20:48		
4	07:47	07:29		16:15 (10)	06:49			18:08 (105)	06:10	05:42		
	16:58	17:34	29	16:44 (10)	18:10	19:46	47	18:55 (105)	20:18	20:49		
5	07:47	07:28		16:15 (10)	06:48			18:08 (105)	06:08	05:42		
	16:59	17:36	31	16:46 (10)	18:11	19:47	48	18:56 (105)	20:20	20:49		
6	07:47	07:26		16:14 (10)	06:46			18:07 (105)	06:07	05:41		
	17:00	17:37	33	16:47 (10)	18:12	19:48	49	18:56 (105)	20:21	20:50		
7	07:47	07:25		16:14 (10)	06:44			18:06 (105)	06:06	05:41		
	17:00	17:38	34	16:48 (10)	18:14	19:49	50	18:56 (105)	20:22	20:51		
8	07:47	07:24		16:14 (10)	07:43			18:06 (105)	06:04	05:41		
	17:02	17:40	34	16:48 (10)	19:15	19:50	50	18:56 (105)	20:23	20:52		
9	07:46	07:23		16:13 (10)	07:41			18:05 (105)	06:03	05:40		
	17:03	17:41	35	16:48 (10)	19:16	19:52	51	18:56 (105)	20:24	20:52		
10	07:46	07:22		16:13 (10)	07:39			18:05 (105)	06:02	05:40		
	17:04	17:42	36	16:49 (10)	19:17	19:53	51	18:56 (105)	20:25	20:53		
11	07:46	07:20		16:13 (10)	07:37			18:05 (105)	06:01	05:40		
	17:05	17:44	36	16:49 (10)	19:18	19:54	51	18:56 (105)	20:26	20:53		
12	07:46	07:19		16:12 (10)	07:36			18:05 (105)	06:00	05:40		
	17:06	17:45	37	16:49 (10)	19:20	19:55	54	19:13 (57)	20:27	20:54		
13	07:45	07:18		16:13 (10)	07:34			18:04 (105)	05:59	05:40		
	17:07	17:46	36	16:49 (10)	19:21	19:56	63	19:16 (57)	20:28	20:54		
14	07:45	07:16		16:13 (10)	07:32			18:05 (105)	05:58	05:40		
	17:08	17:48	36	16:49 (10)	19:22	19:57	67	19:19 (57)	20:29	20:55		
15	07:44	07:15		16:13 (10)	07:31			18:05 (105)	05:57	05:40		
	17:09	17:49	36	16:49 (10)	19:23	19:58	69	19:20 (57)	20:30	20:55		
16	07:44	07:14		16:14 (10)	07:29			18:04 (105)	05:56	05:40		
	17:10	17:50	35	16:49 (10)	19:24	19:59	71	19:20 (57)	20:31	20:56		
17	07:44	07:12		16:14 (10)	07:27			18:05 (105)	05:55	05:40		
	17:12	17:51	34	16:48 (10)	19:25	20:01	71	19:21 (57)	20:32	20:56		
18	07:43	07:11		16:15 (10)	07:25			18:05 (105)	05:54	05:40		
	17:13	17:53	32	16:47 (10)	19:27	20:01	71	19:21 (57)	20:34	20:57		
19	07:42	07:09		16:15 (10)	07:24			18:06 (105)	05:53	05:40		
	17:14	17:54	31	16:46 (10)	19:28	20:02	71	19:22 (57)	20:35	20:57		
20	07:42	07:08		16:17 (10)	07:22			18:07 (105)	05:52	05:40		
	17:15	17:55	28	16:45 (10)	19:29	20:03	69	19:21 (57)	20:36	20:57		
21	07:41	07:06		16:17 (10)	07:20			18:08 (105)	05:51	05:40		
	17:16	17:56	27	16:44 (10)	19:30	20:04	67	19:22 (57)	20:37	20:57		
22	07:40	07:05		16:20 (10)	07:19			18:08 (105)	05:50	05:40		
	17:18	17:58	23	16:43 (10)	19:31	20:05	65	19:21 (57)	20:37	20:58		
23	07:40	07:03		16:21 (10)	07:17			18:10 (105)	05:49	05:41		
	17:19	17:59	19	16:40 (10)	19:32	20:06	62	19:21 (57)	20:38	20:58		
24	07:39	07:02		16:24 (10)	07:15			18:10 (105)	05:48	05:41		
	17:20	18:00	14	16:38 (10)	19:33	20:07	59	19:20 (57)	20:39	20:58		
25	07:38	07:00			07:13			18:12 (105)	05:48	05:41		
	17:21	18:01			19:35	20:08	55	19:20 (57)	20:40	20:58		
26	07:37	06:59			07:12	18:27 (105)	06:21	18:13 (105)	05:47	05:42		
	17:23	18:03			19:36	16	18:43 (105)	20:10	50	19:18 (57)	20:41	20:58
27	07:37	06:57			07:10	18:22 (105)	06:19	18:16 (105)	05:46	05:42		
	17:24	18:04			19:37	24	18:46 (105)	20:11	43	19:17 (57)	20:42	20:58
28	07:36	06:56			07:08		18:19 (105)	06:18		18:19 (105)	05:46	05:42
	17:25	18:05			19:38	29	18:48 (105)	20:12	36	19:17 (57)	20:43	20:58
29	07:35	16:27 (10)			07:06		18:17 (105)	06:16		18:23 (105)	05:45	05:43
	17:27	5	16:32 (10)		19:39	33	18:50 (105)	20:13	23	19:14 (57)	20:44	20:58
30	07:34	16:23 (10)			07:05		18:15 (105)	06:15		19:02 (57)	05:44	05:43
	17:28	13	16:36 (10)		19:40	36	18:51 (105)	20:14	10	19:12 (57)	20:45	20:58
31	07:33	16:20 (10)			07:03		18:13 (105)				05:44	
	17:29	19	16:39 (10)		19:41	39	18:52 (105)				20:46	
Potential sun hours	294	295		370			401		452		457	
Total, worst case	37		730		177		1604					
Sun reduction	0.31		0.38		0.46		0.51					
Oper. time red.	1.00		1.00		1.00		1.00					
Wind dir. red.	0.69		0.69		0.62		0.62					
Total reduction	0.22		0.26		0.29		0.32					
Total, real	8		192		51		510					

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)	
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 103

Licensed user:

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US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 226 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1386)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

July		August		September		October		November		December	
1	05:44	06:09		06:42		18:04 (105)	07:14	06:50		15:43 (10)	07:26
	20:58	20:39		19:53	51	18:55 (105)	19:00	17:12	35	16:18 (10)	16:46
2	05:44	06:10		06:43		18:04 (105)	07:15	06:51		15:42 (10)	07:27
	20:58	20:38		19:51	51	18:55 (105)	18:58	17:10	36	16:18 (10)	16:46
3	05:45	06:11		06:44		18:03 (105)	07:16	06:52		15:43 (10)	07:28
	20:58	20:37		19:49	51	18:54 (105)	18:57	17:09	34	16:17 (10)	16:45
4	05:45	06:12		06:45		18:03 (105)	07:17	06:54		15:44 (10)	07:29
	20:58	20:35		19:48	50	18:53 (105)	18:55	17:08	33	16:17 (10)	16:45
5	05:46	06:13		06:46		18:03 (105)	07:18	06:55		15:44 (10)	07:30
	20:58	20:34		19:46	50	18:53 (105)	18:53	17:07	32	16:16 (10)	16:45
6	05:47	06:14		06:47		18:03 (105)	07:19	06:56		15:44 (10)	07:31
	20:57	20:33		19:44	49	18:52 (105)	18:52	17:05	31	16:15 (10)	16:45
7	05:47	06:15		06:48		18:03 (105)	07:20	06:57		15:46 (10)	07:32
	20:57	20:32		19:42	48	18:51 (105)	18:50	17:04	29	16:15 (10)	16:45
8	05:48	06:16		06:49		18:03 (105)	07:21	06:59		15:47 (10)	07:33
	20:57	20:31		19:41	47	18:50 (105)	18:48	17:03	27	16:14 (10)	16:45
9	05:49	06:17		06:50		18:03 (105)	07:23	07:00		15:48 (10)	07:34
	20:56	20:29		19:39	46	18:49 (105)	18:46	17:02	24	16:12 (10)	16:45
10	05:49	06:18		06:51		18:04 (105)	07:24	07:01		15:50 (10)	07:35
	20:56	20:28		19:37	44	18:48 (105)	18:45	17:01	22	16:12 (10)	16:45
11	05:50	06:19		06:52		18:04 (105)	07:25	07:02		15:51 (10)	07:36
	20:56	20:27		19:35	42	18:46 (105)	18:43	17:00	19	16:10 (10)	16:45
12	05:51	06:20		19:12 (57)		18:05 (105)	07:26	07:04		15:54 (10)	07:37
	20:55	20:25	5	19:17 (57)	19:34	18:45 (105)	18:41	16:59	13	16:07 (10)	16:45
13	05:52	06:21		19:09 (57)	06:54	18:06 (105)	07:27	07:05		15:59 (10)	07:38
	20:55	20:24	12	19:21 (57)	19:32	18:43 (105)	18:40	16:58	4	16:03 (10)	16:45
14	05:52	06:23		18:29 (105)	06:55	18:07 (105)	07:28	07:06			07:38
	20:54	20:22	27	19:22 (57)	19:30	18:41 (105)	18:38	16:57			16:45
15	05:53	06:24		18:25 (105)	06:56	18:09 (105)	07:29	07:07			07:39
	20:54	20:21	38	19:24 (57)	19:28	18:38 (105)	18:37	16:56			16:45
16	05:54	06:25		18:22 (105)	06:57	18:11 (105)	07:31	07:09			07:40
	20:53	20:20	44	19:24 (57)	19:27	18:36 (105)	18:35	16:55			16:45
17	05:55	06:26		18:20 (105)	06:59	18:14 (105)	07:32	16:59 (10)		07:10	07:41
	20:52	20:18	51	19:25 (57)	19:25	18:32 (105)	18:33	7 17:06 (10)		16:54	16:46
18	05:56	06:27		18:18 (105)	07:00	18:21 (105)	07:33	16:55 (10)		07:11	07:41
	20:52	20:17	54	19:25 (57)	19:23	3 18:24 (105)	18:32	15 17:10 (10)		16:53	16:46
19	05:57	06:28		18:16 (105)	07:01		07:34	16:52 (10)		07:12	07:42
	20:51	20:15	59	19:26 (57)	19:21		18:30	20 17:12 (10)		16:53	16:46
20	05:57	06:29		18:15 (105)	07:02		07:35	16:49 (10)		07:14	07:42
	20:50	20:14	63	19:27 (57)	19:20		18:29	25 17:14 (10)		16:52	16:47
21	05:58	06:30		18:14 (105)	07:03		07:36	16:48 (10)		07:15	07:43
	20:49	20:12	65	19:27 (57)	19:18		18:27	27 17:15 (10)		16:51	16:47
22	05:59	06:31		18:12 (105)	07:04		07:38	16:47 (10)		07:16	07:44
	20:49	20:11	68	19:26 (57)	19:16		18:26	29 17:16 (10)		16:50	16:48
23	06:00	06:32		18:11 (105)	07:05		07:39	16:45 (10)		07:17	07:44
	20:48	20:09	69	19:26 (57)	19:14		18:24	32 17:17 (10)		16:50	16:48
24	06:01	06:33		18:10 (105)	07:06		07:40	16:44 (10)		07:18	07:44
	20:47	20:07	71	19:26 (57)	19:12		18:23	33 17:17 (10)		16:49	16:49
25	06:02	06:34		18:09 (105)	07:07		07:41	16:44 (10)		07:19	07:45
	20:46	20:06	71	19:25 (57)	19:11		18:21	34 17:18 (10)		16:49	16:50
26	06:03	06:35		18:08 (105)	07:08		07:42	16:43 (10)		07:21	07:45
	20:45	20:04	71	19:24 (57)	19:09		18:20	35 17:18 (10)		16:48	16:50
27	06:04	06:36		18:07 (105)	07:09		07:44	16:43 (10)		07:22	07:46
	20:44	20:03	71	19:23 (57)	19:07		18:18	35 17:18 (10)		16:48	16:51
28	06:05	06:37		18:06 (105)	07:10		07:45	16:42 (10)		07:23	07:46
	20:43	20:01	69	19:21 (57)	19:05		18:17	36 17:18 (10)		16:47	16:52
29	06:06	06:38		18:06 (105)	07:11		07:46	16:42 (10)		07:24	07:46
	20:42	19:58	67	19:20 (57)	19:04		18:16	37 17:19 (10)		16:47	16:52
30	06:07	06:40		18:05 (105)	07:13		07:47	16:42 (10)		07:25	07:46
	20:41	19:56	62	19:17 (57)	19:02		18:14	36 17:18 (10)		16:46	16:53
31	06:08	06:41		18:04 (105)			07:49	16:42 (10)			07:47
	20:40	19:54	54	19:12 (57)			18:13	36 17:18 (10)			16:54
Potential sun hours	463	431			375		343		294		283
Total, worst case			1091		715		437		339		
Sun reduction			0.64		0.57		0.50		0.29		
Oper. time red.			1.00		1.00		1.00		1.00		
Wind dir. red.			0.62		0.62		0.69		0.69		
Total reduction			0.40		0.36		0.35		0.20		
Total, real			433		256		152		68		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
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Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 104

Licensed user:

EDR

217 Montgomery St.

US-SYRACUSE, NY 13202

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Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 227 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1387)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	January		February		March		April		May		June	
1	07:47		15:35 (105)	07:32		15:30 (105)	06:54		07:01	06:14	05:43	
	16:55	15	15:50 (105)	17:31	47	16:17 (105)	18:06		19:42	20:15	20:46	
2	07:47		15:35 (105)	07:31		15:30 (105)	06:52		06:59	06:12	05:43	
	16:56	16	15:51 (105)	17:32	47	16:17 (105)	18:08		19:44	20:16	20:47	
3	07:47		15:34 (105)	07:30		15:31 (105)	06:51		06:58	06:11	05:42	
	16:57	19	15:53 (105)	17:33	46	16:17 (105)	18:09		19:45	20:17	20:48	
4	07:47		15:34 (105)	07:29		15:30 (105)	06:49		06:56	06:10	05:42	
	16:58	20	15:54 (105)	17:34	46	16:16 (105)	18:10		19:46	20:18	20:49	
5	07:47		15:33 (105)	07:28		15:31 (105)	06:48		06:54	06:08	05:42	
	16:59	23	15:56 (105)	17:36	45	16:16 (105)	18:11		19:47	20:20	20:49	
6	07:47		15:33 (105)	07:26		15:32 (105)	06:46		06:53	06:07	05:41	
	16:59	24	15:57 (105)	17:37	44	16:16 (105)	18:12		19:48	20:21	20:50	
7	07:47		15:32 (105)	07:25		15:33 (105)	06:44		17:18 (57)	06:51	06:06	
	17:00	26	15:58 (105)	17:38	43	16:16 (105)	18:14	11	17:29 (57)	19:49	20:22	
8	07:47		15:31 (105)	07:24		15:34 (105)	07:43		18:15 (57)	06:49	06:04	
	17:02	28	15:59 (105)	17:40	42	16:16 (105)	19:15	16	18:31 (57)	19:50	20:23	
9	07:46		15:31 (105)	07:23		15:34 (105)	07:41		18:12 (57)	06:48	06:03	
	17:03	30	16:01 (105)	17:41	40	16:14 (105)	19:16	20	18:32 (57)	19:52	20:24	
10	07:46		15:31 (105)	07:22		15:35 (105)	07:39		18:12 (57)	06:46	06:02	
	17:04	31	16:02 (105)	17:42	39	16:14 (105)	19:17	22	18:34 (57)	19:53	20:25	
11	07:46		15:30 (105)	07:20		15:37 (105)	07:38		18:10 (57)	06:44	06:01	
	17:05	33	16:03 (105)	17:44	36	16:13 (105)	19:18	24	18:34 (57)	19:54	20:26	
12	07:46		15:30 (105)	07:19		15:38 (105)	07:36		18:09 (57)	06:43	06:00	
	17:06	34	16:04 (105)	17:45	33	16:11 (105)	19:20	25	18:34 (57)	19:55	20:27	
13	07:45		15:30 (105)	07:18		15:40 (105)	07:34		18:09 (57)	06:41	05:59	
	17:07	36	16:06 (105)	17:46	30	16:10 (105)	19:21	26	18:35 (57)	19:56	20:28	
14	07:45		15:30 (105)	07:16		15:42 (105)	07:32		18:08 (57)	06:39	05:58	
	17:08	36	16:06 (105)	17:48	27	16:09 (105)	19:22	27	18:35 (57)	19:57	20:29	
15	07:45		15:30 (105)	07:15		15:44 (105)	07:31		18:08 (57)	06:38	05:57	
	17:09	38	16:08 (105)	17:49	22	16:06 (105)	19:23	27	18:35 (57)	19:58	20:30	
16	07:44		15:29 (105)	07:14		15:47 (105)	07:29		18:07 (57)	06:36	05:56	
	17:10	39	16:08 (105)	17:50	17	16:04 (105)	19:24	27	18:34 (57)	19:59	20:31	
17	07:44		15:28 (105)	07:12		15:52 (105)	07:27		18:08 (57)	06:34	05:55	
	17:12	41	16:09 (105)	17:51	6	15:58 (105)	19:25	26	18:34 (57)	20:01	20:32	
18	07:43		15:29 (105)	07:11		07:25			18:08 (57)	06:33	05:54	
	17:13	41	16:10 (105)	17:53		19:27		25	18:33 (57)	20:01	20:34	
19	07:42		15:28 (105)	07:09		07:24			18:08 (57)	06:31	05:53	
	17:14	43	16:11 (105)	17:54		19:28		24	18:32 (57)	20:02	20:35	
20	07:42		15:28 (105)	07:08		07:22			18:09 (57)	06:30	05:52	
	17:15	43	16:11 (105)	17:55		19:29		21	18:30 (57)	20:03	20:36	
21	07:41		15:28 (105)	07:06		07:20			18:11 (57)	06:28	05:51	
	17:16	45	16:13 (105)	17:56		19:30		19	18:30 (57)	20:04	20:37	
22	07:41		15:28 (105)	07:05		07:19			18:12 (57)	06:27	05:50	
	17:18	45	16:13 (105)	17:58		19:31		15	18:27 (57)	20:05	20:37	
23	07:40		15:28 (105)	07:03		07:17			18:15 (57)	06:25	05:49	
	17:19	45	16:13 (105)	17:59		19:32		9	18:24 (57)	20:06	20:38	
24	07:39		15:28 (105)	07:02		07:15			06:24	05:48	05:41	
	17:20	46	16:14 (105)	18:00		19:33			20:07	20:39	20:58	
25	07:38		15:29 (105)	07:00		07:13			06:22	05:48	05:41	
	17:21	46	16:15 (105)	18:01		19:35			20:08	20:40	20:58	
26	07:37		15:28 (105)	06:59		07:12			06:21	05:47	05:42	
	17:23	48	16:16 (105)	18:03		19:36			20:10	20:41	20:58	
27	07:37		15:28 (105)	06:57		07:10			06:19	05:46	05:42	
	17:24	48	16:16 (105)	18:04		19:37			20:11	20:42	20:58	
28	07:36		15:29 (105)	06:56		07:08			06:18	05:46	05:42	
	17:25	47	16:16 (105)	18:05		19:38			20:12	20:43	20:58	
29	07:35		15:29 (105)			07:06			06:16	05:45	05:43	
	17:27	48	16:17 (105)			19:39			20:13	20:44	20:58	
30	07:34		15:29 (105)			07:05			06:15	05:44	05:43	
	17:28	48	16:17 (105)			19:40			20:14	20:45	20:58	
31	07:33		15:29 (105)			07:03				05:44		
	17:29	48	16:17 (105)			19:41			20:46			
Potential sun hours		294		295		370		401		452	457	
Total, worst case		1130		610		364						
Sun reduction		0.31		0.38		0.46						
Oper. time red.		1.00		1.00		1.00						
Wind dir. red.		0.71		0.71		0.64						
Total reduction		0.22		0.27		0.30						
Total, real		249		165		108						

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 105

Licensed user:

EDR

217 Montgomery St.

US-SYRACUSE, NY 13202

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Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 227 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1387)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

July		August		September		October		November		December	
1	05:44	06:09	06:42			07:14		17:48 (57)	06:50	15:05 (105)	07:26
	20:58	20:39	19:53			19:00	26	18:14 (57)	17:12	15:44 (105)	16:46
2	05:44	06:10	06:43			07:15		17:48 (57)	06:51	15:04 (105)	07:27
	20:58	20:38	19:51			18:58	25	18:13 (57)	17:10	15:44 (105)	16:46
3	05:45	06:11	06:44			07:16		17:49 (57)	06:52	15:02 (105)	07:28
	20:58	20:37	19:49			18:57	23	18:12 (57)	17:09	15:45 (105)	16:45
4	05:45	06:12	06:45			07:17		17:49 (57)	06:54	15:02 (105)	07:29
	20:58	20:35	19:48			18:55	21	18:10 (57)	17:08	15:46 (105)	16:45
5	05:46	06:13	06:46			07:18		17:51 (57)	06:55	15:02 (105)	07:30
	20:58	20:34	19:46			18:53	17	18:08 (57)	17:07	15:46 (105)	16:45
6	05:47	06:14	06:47			07:19		17:52 (57)	06:56	15:01 (105)	07:31
	20:57	20:33	19:44			18:52	14	18:06 (57)	17:05	15:46 (105)	16:45
7	05:47	06:15	06:48			07:20		17:57 (57)	06:57	15:01 (105)	07:32
	20:57	20:32	19:42			18:50	6	18:03 (57)	17:04	15:47 (105)	16:45
8	05:48	06:16	06:49			07:21		06:59		15:00 (105)	07:33
	20:57	20:31	19:41			18:48		17:03	47	15:47 (105)	16:45
9	05:49	06:17	06:50			07:23		07:00		15:00 (105)	07:34
	20:56	20:29	19:39			18:46		17:02	47	15:47 (105)	16:45
10	05:49	06:18	06:51			07:24		07:01		15:00 (105)	07:35
	20:56	20:28	19:37			18:45		17:01	48	15:48 (105)	16:45
11	05:50	06:19	06:52			07:25		07:02		15:00 (105)	07:36
	20:56	20:27	19:35			18:43		17:00	48	15:48 (105)	16:45
12	05:51	06:20	06:53			07:26		07:04		15:00 (105)	07:37
	20:55	20:25	19:34			18:41		16:59	48	15:48 (105)	16:45
13	05:52	06:21	06:54			07:27		07:05		15:01 (105)	07:38
	20:55	20:24	19:32			18:40		16:58	47	15:48 (105)	16:45
14	05:52	06:23	06:55			07:28		07:06		15:00 (105)	07:38
	20:54	20:22	19:30			18:38		16:57	48	15:48 (105)	16:45
15	05:53	06:24	06:56			07:29		07:07		15:00 (105)	07:39
	20:54	20:21	19:28			18:37		16:56	48	15:48 (105)	16:45
16	05:54	06:25	06:57			07:31		07:09		15:01 (105)	07:40
	20:53	20:20	19:27			18:35		16:55	48	15:49 (105)	16:45
17	05:55	06:26	06:59			07:32		07:10		15:01 (105)	07:41
	20:52	20:18	19:25			18:33		16:54	47	15:48 (105)	16:46
18	05:56	06:27	07:00			07:33		07:11		15:02 (105)	07:41
	20:52	20:17	19:23			18:32		16:53	46	15:48 (105)	16:46
19	05:57	06:28	07:01			07:34		07:12		15:03 (105)	07:42
	20:51	20:15	19:21			18:30		16:53	45	15:48 (105)	16:46
20	05:57	06:29	07:02		18:02 (57)	07:35		07:14		15:03 (105)	07:42
	20:50	20:14	19:20	7	18:09 (57)	18:29		16:52	45	15:48 (105)	16:47
21	05:58	06:30	07:03		17:58 (57)	07:36		07:15		15:03 (105)	07:43
	20:49	20:12	19:18	14	18:12 (57)	18:27		16:51	45	15:48 (105)	16:47
22	05:59	06:31	07:04		17:56 (57)	07:38		07:16		15:05 (105)	07:44
	20:49	20:11	19:16	17	18:13 (57)	18:26		16:50	43	15:48 (105)	16:48
23	06:00	06:32	07:05		17:54 (57)	07:39		07:17		15:05 (105)	07:44
	20:48	20:09	19:14	20	18:14 (57)	18:24		16:50	43	15:48 (105)	16:48
24	06:01	06:33	07:06		17:52 (57)	07:40		07:18		15:06 (105)	07:44
	20:47	20:07	19:12	23	18:15 (57)	18:23		16:49	41	15:47 (105)	16:49
25	06:02	06:34	07:07		17:51 (57)	07:41		07:20		15:06 (105)	07:45
	20:46	20:06	19:11	24	18:15 (57)	18:21	10	16:31 (105)	41	15:47 (105)	16:50
26	06:03	06:35	07:08		17:50 (57)	07:42		07:21		15:07 (105)	07:45
	20:45	20:04	19:09	26	18:16 (57)	18:20	18	16:34 (105)	39	15:46 (105)	16:50
27	06:04	06:36	07:09		17:50 (57)	07:44		07:22		15:09 (105)	07:46
	20:44	20:03	19:07	27	18:17 (57)	18:18	24	16:37 (105)	38	15:47 (105)	16:51
28	06:05	06:37	07:10		17:49 (57)	07:45		07:23		15:10 (105)	07:46
	20:43	20:01	19:05	27	18:16 (57)	18:17	28	16:38 (105)	36	15:46 (105)	16:52
29	06:06	06:38	07:11		17:49 (57)	07:46		07:24		15:10 (105)	07:46
	20:42	19:58	19:04	27	18:16 (57)	18:16	31	16:40 (105)	36	15:46 (105)	16:52
30	06:07	06:40	07:13		17:48 (57)	07:47		07:25		15:11 (105)	07:46
	20:41	19:56	19:02	27	18:15 (57)	18:14	34	16:41 (105)	34	15:45 (105)	16:53
31	06:08	06:41			07:49			16:05 (105)			07:47
	20:40	19:54			18:13	37	16:42 (105)			16:54	12
Potential sun hours	463	431	375		343			294		283	
Total, worst case			239		314			1309		316	
Sun reduction			0.57		0.50			0.29		0.27	
Oper. time red.			1.00		1.00			1.00		1.00	
Wind dir. red.			0.64		0.68			0.71		0.71	
Total reduction			0.37		0.34			0.21		0.19	
Total, real			88		107			270		61	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
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Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 106

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 231 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1391)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	January		February		March		April		May		June					
1	07:47	08:21 (41)	07:32	08:32 (41)	06:54	07:28 (43)	07:01	06:14	06:44 (101)	05:43	06:51 (101)					
2	16:55	24	08:45 (41)	17:31	22	08:54 (41)	18:07	31	07:59 (43)	19:43	20:15	36	07:20 (101)	20:47	23	07:14 (101)
3	07:47	08:21 (41)	07:31	08:34 (41)	06:53	07:26 (43)	07:00	06:12	06:43 (101)	05:43	06:51 (101)					
4	16:56	25	08:46 (41)	17:32	19	08:53 (41)	18:08	34	08:00 (43)	19:44	20:17	37	07:20 (101)	20:48	21	07:12 (101)
5	07:47	08:21 (41)	07:30	08:36 (41)	06:51	07:26 (43)	06:58	06:11	06:42 (101)	05:43	06:53 (101)					
6	16:57	25	08:46 (41)	17:33	15	08:51 (41)	18:09	35	08:01 (43)	19:45	20:18	39	07:21 (101)	20:48	19	07:12 (101)
7	07:47	08:21 (41)	07:29	08:40 (41)	06:49	07:24 (43)	06:56	06:10	06:42 (101)	05:42	06:53 (101)					
8	16:58	26	08:47 (41)	17:35	7	08:47 (41)	18:10	38	08:02 (43)	19:46	20:19	40	07:22 (101)	20:49	17	07:10 (101)
9	07:47	08:21 (41)	07:28	08:48 (41)	06:48	07:23 (43)	06:54	06:08	06:42 (101)	05:42	06:55 (101)					
10	16:59	27	08:48 (41)	17:36	18:11	08:02 (43)	19:47	20:20	07:22 (101)	20:50	15	07:10 (101)				
11	07:47	08:21 (41)	07:27	08:49 (41)	06:46	07:23 (43)	06:53	06:07	06:40 (101)	05:41	06:57 (101)					
12	17:00	28	08:49 (41)	17:37	18:13	08:03 (43)	19:48	20:21	07:22 (101)	20:50	12	07:09 (101)				
13	07:47	08:22 (41)	07:25	08:50 (41)	06:44	07:22 (43)	06:51	06:06	06:40 (101)	05:41	06:59 (101)					
14	17:01	28	08:50 (41)	17:39	18:14	08:02 (43)	19:49	20:22	07:22 (101)	20:51	9	07:08 (101)				
15	07:47	08:22 (41)	07:24	08:51 (41)	06:43	08:21 (43)	06:49	06:05	06:40 (101)	05:41	07:01 (101)					
16	17:02	29	08:51 (41)	17:40	19:15	09:02 (43)	19:51	20:23	07:22 (101)	20:52	3	07:04 (101)				
17	07:47	08:21 (41)	07:23	08:52 (41)	06:42	08:22 (43)	06:48	06:03	06:40 (101)	05:41	06:51 (101)					
18	17:03	30	08:51 (41)	17:41	1	07:55 (112)	19:16	41	09:03 (43)	19:52	20:24	43	07:23 (101)	20:52	06:51 (101)	
19	07:46	08:22 (41)	07:22	08:52 (41)	06:41	07:48 (112)	07:39	06:02	06:40 (101)	05:40	06:50 (101)					
20	17:04	30	08:52 (41)	17:42	11	07:59 (112)	19:17	41	09:02 (43)	19:53	20:25	43	07:23 (101)	20:53	06:50 (101)	
21	07:46	08:22 (41)	07:21	08:53 (41)	06:40	07:46 (112)	07:38	06:01	06:40 (101)	05:40	06:49 (101)					
22	17:05	31	08:53 (41)	17:44	16	08:02 (112)	19:19	40	09:01 (43)	19:54	20:26	43	07:23 (101)	20:54	06:48 (101)	
23	07:46	08:21 (41)	07:19	08:54 (41)	06:39	07:45 (112)	07:36	06:00	06:40 (101)	05:40	06:47 (101)					
24	17:06	32	08:53 (41)	17:45	18	08:03 (112)	19:20	39	09:01 (43)	19:55	20:27	43	07:23 (101)	20:54	06:46 (101)	
25	07:46	08:22 (41)	07:18	08:54 (41)	06:38	07:44 (112)	07:34	05:59	06:40 (101)	05:40	06:45 (101)					
26	17:07	32	08:54 (41)	17:46	20	08:04 (112)	19:21	39	09:00 (43)	19:56	20:29	42	07:22 (101)	20:55	06:44 (101)	
27	07:45	08:22 (41)	07:17	08:55 (41)	06:37	07:43 (112)	07:33	05:58	06:40 (101)	05:40	06:43 (101)					
28	17:08	32	08:54 (41)	17:48	22	08:05 (112)	19:22	38	08:59 (43)	19:57	20:30	42	07:22 (101)	20:55	06:42 (101)	
29	07:45	08:22 (41)	07:15	08:55 (41)	06:36	07:42 (112)	07:31	05:57	06:40 (101)	05:40	06:41 (101)					
30	17:09	34	08:56 (41)	17:49	23	08:05 (112)	19:23	37	08:58 (43)	19:59	20:31	42	07:22 (101)	20:56	06:40 (101)	
31	07:44	08:22 (41)	07:14	08:56 (41)	06:35	07:42 (112)	07:29	05:56	06:41 (101)	05:40	06:39 (101)					
32	17:11	34	08:56 (41)	17:50	24	08:06 (112)	19:24	34	08:57 (43)	20:00	20:32	41	07:22 (101)	20:56	06:38 (101)	
33	07:44	08:23 (41)	07:12	08:57 (41)	06:34	07:42 (112)	07:27	05:55	06:41 (101)	05:40	06:37 (101)					
34	17:12	34	08:57 (41)	17:52	24	08:06 (112)	19:26	33	08:56 (43)	20:00	20:33	40	07:21 (101)	20:56	06:36 (101)	
35	07:43	08:23 (41)	07:11	08:58 (41)	06:33	07:42 (112)	07:26	05:54	06:41 (101)	05:40	06:35 (101)					
36	17:13	34	08:57 (41)	17:53	24	08:06 (112)	19:27	30	08:54 (43)	20:01	20:34	40	07:21 (101)	20:57	06:34 (101)	
37	07:43	08:22 (41)	07:10	08:58 (41)	06:32	07:42 (112)	07:24	05:53	06:41 (101)	05:40	06:33 (101)					
38	17:14	35	08:57 (41)	17:54	24	08:06 (112)	19:28	27	08:52 (43)	20:02	20:35	39	07:20 (101)	20:57	06:32 (101)	
39	07:42	08:23 (41)	07:08	08:58 (41)	06:31	07:42 (112)	07:22	05:52	06:42 (101)	05:40	06:31 (101)					
40	17:15	35	08:58 (41)	17:55	23	08:05 (112)	19:29	23	08:50 (43)	20:03	20:36	38	07:20 (101)	20:57	06:30 (101)	
41	07:41	08:23 (41)	07:07	08:59 (41)	06:30	07:43 (112)	07:20	05:51	06:42 (101)	05:40	06:29 (101)					
42	17:17	35	08:58 (41)	17:57	22	08:05 (112)	19:30	18	08:47 (43)	20:04	20:37	37	07:19 (101)	20:58	06:28 (101)	
43	07:41	08:24 (41)	07:05	08:59 (41)	06:29	07:43 (112)	07:19	05:50	06:43 (101)	05:41	06:27 (101)					
44	17:18	34	08:58 (41)	17:58	20	08:03 (112)	19:31	9	08:42 (43)	20:05	20:38	37	07:20 (101)	20:58	06:26 (101)	
45	07:40	08:24 (41)	07:04	08:59 (41)	06:28	07:45 (112)	07:17	05:49	06:43 (101)	05:41	06:25 (101)					
46	17:19	33	08:57 (41)	17:59	18	08:03 (112)	19:32	20:39	07:19 (101)	20:58	06:24 (101)					
47	07:39	08:25 (41)	07:02	08:58 (41)	06:27	07:46 (112)	07:15	05:48	06:44 (101)	05:41	06:23 (101)					
48	17:20	33	08:58 (41)	18:00	15	08:01 (112)	19:34	10	07:08 (101)	20:40	34	07:18 (101)	20:58	06:22 (101)		
49	07:39	08:26 (41)	07:01	08:59 (41)	06:26	07:37 (43)	07:13	05:47	06:45 (101)	05:41	06:21 (101)					
50	17:22	32	08:58 (41)	18:02	21	07:58 (112)	19:35	20:09	07:12 (101)	20:41	33	07:18 (101)	20:59	06:20 (101)		
51	07:38	08:26 (41)	06:59	08:59 (41)	06:25	07:34 (43)	07:12	05:46	06:52 (101)	05:47	31	07:17 (101)	20:59	06:19 (101)		
52	17:23	32	08:58 (41)	18:03	21	07:55 (43)	19:36	20:10	07:15 (101)	20:42	30	07:16 (101)	20:59	06:18 (101)		
53	07:37	08:27 (41)	06:57	08:59 (41)	06:24	07:31 (43)	07:10	05:45	06:49 (101)	05:46	27	07:16 (101)	20:59	06:17 (101)		
54	17:24	31	08:58 (41)	18:04	25	07:56 (43)	19:37	06:18	07:16 (101)	20:42	30	07:16 (101)	20:59	06:16 (101)		
55	07:36	08:27 (41)	06:56	08:59 (41)	06:23	07:30 (43)	07:08	05:44	06:48 (101)	05:46	29	07:16 (101)	20:59	06:15 (101)		
56	17:25	30	08:57 (41)	18:05	29	07:59 (43)	19:38	20:12	07:18 (101)	20:43	26	07:15 (101)	20:59	06:14 (101)		
57	07:35	08:28 (41)	06:55	08:58 (41)	06:22	07:29 (43)	07:07	05:43	06:46 (101)	05:45	27	07:15 (101)	20:59	06:13 (101)		
58	17:27	29	08:57 (41)	18:06	30	07:58 (43)	19:39	20:13	07:18 (101)	20:44	27	07:15 (101)	20:59	06:12 (101)		
59	07:34	08:29 (41)	06:54	08:57 (41)	06:21	07:28 (43)	07:06	05:42	06:45 (101)	05:45	32	07:18 (101)	20:59	06:11 (101)		
60	17:28	27	08:56 (41)	18:07	31	07:57 (43)	19:40	20:14	07:19 (101)	20:45	34	07:19 (101)	20:59	06:10 (101)		
61	07:33	08:30 (41)	06:53	08:56 (41)	06:20	07:27 (43)	07:05	05:41	06:50 (101)	05:43	26	07:19 (101)	20:59	06:09 (101)		
62	17:29	25	08:55 (41)	18:08	32	07:56 (43)	19:41	20:15	07:20 (101)	20:59	24	07:14 (101)	20:59	06:08 (101)		
Potential sun hours	294		295		370		401		452		457					
Total, worst case	946		464		747		174		1158		119					
Sun reduction	0.31		0.38		0.46		0.51		0.56		0.65					
Oper. time red.	1.00		1.00		1.00		1.00		1.00		1.00					
Wind dir. red.	0.57		0.58		0.58		0.65		0.65		0.65					
Total reduction	0.17		0.22		0.26		0.33		0.36		0.42					
Total, real	165		101		198		57		417		50					

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 107

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 231 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1391)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117		541	386	285 8,759

Idle start wind speed: Cut in wind speed from power curve

	July		August		September		October		November		December			
1	05:44		06:09		06:51 (101)	06:42	07:14		08:00 (43)	06:50	07:18 (112)	07:27	08:04 (41)	
	20:59		20:39	42	07:33 (101)	19:53	19:00	40	08:40 (43)	17:12	10 07:28 (112)	16:46	31 08:35 (41)	
2	05:44		06:10		06:51 (101)	06:43	07:15		08:00 (43)	06:51		07:28	08:05 (41)	
	20:59		20:38	42	07:33 (101)	19:51	18:59	40	08:40 (43)	17:10		16:46	30 08:35 (41)	
3	05:45		06:11		06:51 (101)	06:44	07:16		07:59 (43)	06:53		07:29	08:05 (41)	
	20:58		20:37	42	07:33 (101)	19:49	18:57	41	08:40 (43)	17:09		16:45	30 08:35 (41)	
4	05:45		06:12		06:50 (101)	06:45	07:17		07:58 (43)	06:54		07:30	08:06 (41)	
	20:58		20:36	42	07:32 (101)	19:48	18:55	41	08:39 (43)	17:08		16:45	29 08:35 (41)	
5	05:46	07:05 (101)	06:13		06:50 (101)	06:46	07:18		07:59 (43)	06:55		07:31	08:07 (41)	
	20:58	7 07:12 (101)	20:35	42	07:32 (101)	19:46	18:53	41	08:40 (43)	17:07		16:45	28 08:35 (41)	
6	05:47	07:04 (101)	06:14		06:50 (101)	06:47	07:19		07:59 (43)	06:56		07:32	08:07 (41)	
	20:58	10 07:14 (101)	20:33	42	07:32 (101)	19:44	18:52	40	08:39 (43)	17:06		16:45	28 08:35 (41)	
7	05:47	07:02 (101)	06:15		06:50 (101)	06:48	07:20		07:59 (43)	06:58	08:09 (41)	07:33	08:08 (41)	
	20:57	13 07:15 (101)	20:32	41	07:31 (101)	19:43	18:50	40	08:39 (43)	17:04	9 08:18 (41)	16:45	27 08:35 (41)	
8	05:48	07:01 (101)	06:16		06:50 (101)	06:49	07:22		07:59 (43)	06:59		07:34	08:09 (41)	
	20:57	16 07:17 (101)	20:31	41	07:31 (101)	19:41	18:48	39	08:38 (43)	17:03	15 08:21 (41)	16:45	26 08:35 (41)	
9	05:49	07:01 (101)	06:17		06:51 (101)	06:50	07:23		07:59 (43)	07:00		07:35	08:10 (41)	
	20:57	18 07:19 (101)	20:29	39	07:30 (101)	19:39	18:47	38	08:37 (43)	17:02	20 08:24 (41)	16:45	25 08:35 (41)	
10	05:49	06:59 (101)	06:18		06:52 (101)	06:51	07:24		07:59 (43)	07:01		07:35	08:11 (41)	
	20:56	20 07:19 (101)	20:28	39	07:31 (101)	19:37	18:45	37	08:36 (43)	17:01	22 08:25 (41)	16:45	25 08:36 (41)	
11	05:50	06:59 (101)	06:19		06:53 (101)	06:52	07:25		07:59 (43)	07:03		07:36	08:12 (41)	
	20:56	22 07:21 (101)	20:27	37	07:30 (101)	19:36	18:43	35	08:34 (43)	17:00	25 08:26 (41)	16:45	24 08:36 (41)	
12	05:51	06:58 (101)	06:21		06:53 (101)	06:53	07:26		08:01 (43)	07:04		07:37	08:12 (41)	
	20:55	24 07:22 (101)	20:25	36	07:29 (101)	19:34	18:42	33	08:34 (43)	16:59	27 08:28 (41)	16:45	23 08:35 (41)	
13	05:52	06:58 (101)	06:22		06:54 (101)	06:54	07:27		08:02 (43)	07:05		07:38	08:13 (41)	
	20:55	25 07:23 (101)	20:24	34	07:28 (101)	19:32	18:40	30	08:32 (43)	16:58	29 08:29 (41)	16:45	22 08:35 (41)	
14	05:52	06:56 (101)	06:23		06:55 (101)	06:56	07:28		08:03 (43)	07:06		07:39	08:14 (41)	
	20:54	27 07:23 (101)	20:23	31	07:26 (101)	19:30	18:38	27	08:30 (43)	16:57	30 08:29 (41)	16:45	22 08:36 (41)	
15	05:53	06:56 (101)	06:24		06:56 (101)	06:57	07:30		08:04 (43)	07:08		07:39	08:15 (41)	
	20:54	28 07:24 (101)	20:21	29	07:25 (101)	19:29	18:37	24	08:28 (43)	16:56	30 08:30 (41)	16:45	21 08:36 (41)	
16	05:54	06:56 (101)	06:25		06:57 (101)	06:58	07:31		08:06 (43)	07:09		07:40	08:15 (41)	
	20:53	29 07:25 (101)	20:20	26	07:23 (101)	19:27	18:35	21	08:27 (112)	16:55	32 08:31 (41)	16:46	21 08:36 (41)	
17	05:55	06:55 (101)	06:26		06:59 (101)	06:59	07:32		08:11 (43)	07:10		07:41	08:16 (41)	
	20:53	31 07:26 (101)	20:18	22	07:21 (101)	19:25	18:34	20	08:31 (112)	16:54	32 08:31 (41)	16:46	20 08:36 (41)	
18	05:56	06:55 (101)	06:27		07:01 (101)	07:00	07:33		08:17 (112)	07:11		07:42	08:17 (41)	
	20:52	32 07:27 (101)	20:17	17	07:18 (101)	19:23	18:32	16	08:33 (112)	16:53	33 08:32 (41)	16:46	20 08:37 (41)	
19	05:57	06:54 (101)	06:28		07:05 (101)	07:01	07:34		08:15 (112)	07:13		07:42	08:17 (41)	
	20:51	34 07:28 (101)	20:15	9	07:14 (101)	19:21	18:30	19	08:34 (112)	16:53	33 08:32 (41)	16:47	20 08:37 (41)	
20	05:58	06:53 (101)	06:29			07:02	07:35		08:13 (112)	07:14		07:43	08:18 (41)	
	20:50	35 07:28 (101)	20:14			19:20	18:29	21	08:34 (112)	16:52	34 08:33 (41)	16:47	19 08:37 (41)	
21	05:58	06:53 (101)	06:30			07:03	08:21 (43)	07:37	08:13 (112)	07:15		08:00 (41)	07:43	08:18 (41)
	20:50	36 07:29 (101)	20:12			19:18	4 08:25 (43)	18:27	23 08:36 (112)	16:51	34 08:34 (41)	16:47	19 08:37 (41)	
22	05:59	06:53 (101)	06:31			07:04	08:15 (43)	07:38	08:12 (112)	07:16		07:59 (41)	07:44	08:19 (41)
	20:49	37 07:30 (101)	20:11			19:16	15 08:30 (43)	18:26	24 08:36 (112)	16:51	35 08:34 (41)	16:48	19 08:38 (41)	
23	06:00	06:52 (101)	06:32			07:05	08:11 (43)	07:39	08:12 (112)	07:17		07:59 (41)	07:44	08:19 (41)
	20:48	38 07:30 (101)	20:09			19:14	22 08:33 (43)	18:24	24 08:36 (112)	16:50	35 08:34 (41)	16:48	19 08:38 (41)	
24	06:01	06:52 (101)	06:33			07:06	08:09 (43)	07:40	08:11 (112)	07:19		08:00 (41)	07:45	08:20 (41)
	20:47	39 07:31 (101)	20:08			19:13	26 08:35 (43)	18:23	24 08:35 (112)	16:49	34 08:34 (41)	16:49	20 08:40 (41)	
25	06:02	06:52 (101)	06:34			07:07	08:08 (43)	07:41	08:12 (112)	07:20		08:01 (41)	07:45	08:20 (41)
	20:46	39 07:31 (101)	20:06			19:11	29 08:37 (43)	18:21	24 08:36 (112)	16:49	34 08:35 (41)	16:50	20 08:40 (41)	
26	06:03	06:52 (101)	06:35			07:08	08:06 (43)	07:43	08:12 (112)	07:21		08:01 (41)	07:46	08:20 (41)
	20:45	40 07:32 (101)	20:04			19:09	32 08:38 (43)	18:20	23 08:35 (112)	16:48	34 08:35 (41)	16:50	20 08:40 (41)	
27	06:04	06:51 (101)	06:36			07:09	08:05 (43)	07:44	08:12 (112)	07:22		08:01 (41)	07:46	08:21 (41)
	20:44	41 07:32 (101)	20:03			19:07	34 08:39 (43)	18:18	22 08:34 (112)	16:48	34 08:35 (41)	16:51	21 08:42 (41)	
28	06:05	06:51 (101)	06:38			07:11	08:03 (43)	07:45	08:13 (112)	07:23		08:02 (41)	07:46	08:21 (41)
	20:43	41 07:32 (101)	20:01			19:06	36 08:39 (43)	18:17	21 08:34 (112)	16:47	33 08:35 (41)	16:52	21 08:42 (41)	
29	06:06	06:51 (101)	06:39			07:12	08:02 (43)	07:46	08:14 (112)	07:24		08:02 (41)	07:46	08:21 (41)
	20:42	42 07:33 (101)	20:00			19:04	38 08:40 (43)	18:16	19 08:33 (112)	16:47	32 08:34 (41)	16:52	22 08:43 (41)	
30	06:07	06:51 (101)	06:40			07:13	08:01 (43)	07:48	08:14 (112)	07:25		08:02 (41)	07:47	08:21 (41)
	20:41	42 07:33 (101)	19:56			19:02	39 08:40 (43)	18:14	18 08:32 (112)	16:46	32 08:34 (41)	16:53	22 08:43 (41)	
31	06:08	06:51 (101)	06:41					07:49	08:16 (112)			07:47	08:21 (41)	
	20:40	42 07:33 (101)	19:55					18:13	15 08:31 (112)			16:54	23 08:44 (41)	
Potential sun hours	464		431			375		343		294		283		
Total, worst case	808		653			275		880		718		717		
Sun reduction	0.67		0.64			0.57		0.50		0.29		0.27		
Oper. time red.	1.00		1.00			1.00		1.00		1.00		1.00		
Wind dir. red.	0.65		0.65			0.58		0.58		0.57		0.57		
Total reduction	0.43		0.41			0.33		0.29		0.16		0.15		
Total, real	348		269			90		253		117		109		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 108

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 232 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1392)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

January		February		March		April		May		June	
1 07:47	07:32	08:05 (41)	06:54	07:01	08:00 (43)	06:14	05:43	06:29 (101)			
16:55	17:31	29 08:34 (41)	18:07	19:43	23 08:23 (43)	20:15	20:47	35 07:04 (101)			
2 07:47	07:31	08:04 (41)	06:53	07:00	08:01 (43)	06:12	05:43	06:29 (101)			
16:56	17:32	31 08:35 (41)	18:08	19:44	19 08:20 (43)	20:17	20:48	35 07:04 (101)			
3 07:47	07:30	08:04 (41)	06:51	06:58	08:04 (43)	06:11	05:43	06:30 (101)			
16:57	17:33	32 08:36 (41)	18:09	19:45	12 08:16 (43)	20:18	20:48	34 07:04 (101)			
4 07:47	07:29	08:04 (41)	06:49	06:56		06:10	05:42	06:30 (101)			
16:58	17:35	32 08:36 (41)	18:10	19:46		20:19	8 06:50 (101)	20:49	33 07:03 (101)		
5 07:47	07:28	08:03 (41)	06:48	06:54		06:08	06:39 (101)	05:42	06:30 (101)		
16:59	17:36	33 08:36 (41)	18:11	19:47		20:20	15 06:54 (101)	20:50	33 07:03 (101)		
6 07:47	07:27	08:03 (41)	06:46	06:53		06:07	06:35 (101)	05:41	06:31 (101)		
17:00	17:37	33 08:36 (41)	18:13	19:48		20:21	20 06:55 (101)	20:50	33 07:04 (101)		
7 07:47	07:25	08:04 (41)	06:44	06:51		06:06	06:34 (101)	05:41	06:32 (101)		
17:01	17:39	32 08:36 (41)	18:14	19:49		20:22	23 06:57 (101)	20:51	32 07:04 (101)		
8 07:47	07:24	08:04 (41)	07:43	06:49		06:05	06:33 (101)	05:41	06:32 (101)		
17:02	17:40	33 08:37 (41)	19:15	19:51		20:23	25 06:58 (101)	20:52	31 07:03 (101)		
9 07:47	07:23	08:05 (41)	07:41	06:48		06:03	06:32 (101)	05:41	06:32 (101)		
17:03	17:41	32 08:37 (41)	19:16	19:52		20:24	28 07:00 (101)	20:52	31 07:03 (101)		
10 07:46	07:22	08:04 (41)	07:39	06:46		06:02	06:31 (101)	05:40	06:33 (101)		
17:04	17:42	32 08:36 (41)	19:17	19:53		20:25	30 07:01 (101)	20:53	30 07:03 (101)		
11 07:46	07:21	08:05 (41)	07:38	08:14 (43)	06:44	06:01	06:30 (101)	05:40	06:33 (101)		
17:05	17:44	31 08:36 (41)	19:19	8 08:22 (43)	19:54	20:26	31 07:01 (101)	20:54	30 07:03 (101)		
12 07:46	07:19	08:06 (41)	07:36	08:10 (43)	06:43	06:00	06:29 (101)	05:40	06:34 (101)		
17:06	17:45	29 08:35 (41)	19:20	16 08:26 (43)	19:55	20:27	33 07:02 (101)	20:54	29 07:03 (101)		
13 07:46	07:18	08:06 (41)	07:34	08:06 (43)	06:41	05:59	06:29 (101)	05:40	06:34 (101)		
17:07	17:46	28 08:34 (41)	19:21	22 08:28 (43)	19:56	20:29	34 07:03 (101)	20:55	29 07:03 (101)		
14 07:45	07:17	08:08 (41)	07:33	08:04 (43)	06:39	05:58	06:28 (101)	05:40	06:35 (101)		
17:08	17:48	25 08:33 (41)	19:22	26 08:30 (43)	19:57	20:30	35 07:03 (101)	20:55	28 07:03 (101)		
15 07:45	07:15	08:08 (41)	07:31	08:02 (43)	06:38	05:57	06:28 (101)	05:40	06:35 (101)		
17:09	17:49	23 08:31 (41)	19:23	29 08:31 (43)	19:59	20:31	35 07:03 (101)	20:56	28 07:03 (101)		
16 07:44	07:14	08:10 (41)	07:29	08:01 (43)	06:36	05:56	06:27 (101)	05:40	06:36 (101)		
17:11	17:50	20 08:30 (41)	19:24	31 08:32 (43)	20:00	20:32	37 07:04 (101)	20:56	27 07:03 (101)		
17 07:44	07:12	08:13 (41)	07:27	08:00 (43)	06:35	05:55	06:27 (101)	05:40	06:36 (101)		
17:12	17:52	15 08:28 (41)	19:26	33 08:33 (43)	20:00	20:33	37 07:04 (101)	20:56	27 07:03 (101)		
18 07:43	07:11	08:16 (41)	07:26	07:58 (43)	06:33	05:54	06:27 (101)	05:40	06:36 (101)		
17:13	17:53	8 08:24 (41)	19:27	35 08:33 (43)	20:01	20:34	37 07:04 (101)	20:57	27 07:03 (101)		
19 07:43	07:10		07:24	07:57 (43)	06:31	05:53	06:27 (101)	05:40	06:36 (101)		
17:14	17:54		19:28	36 08:33 (43)	20:02	20:35	37 07:04 (101)	20:57	27 07:03 (101)		
20 07:42	07:08		07:22	07:57 (43)	06:30	05:52	06:26 (101)	05:40	06:36 (101)		
17:15	17:55		19:29	37 08:34 (43)	20:03	20:36	38 07:04 (101)	20:57	27 07:03 (101)		
21 07:41	07:07		07:20	07:56 (43)	06:28	05:51	06:26 (101)	05:40	06:36 (101)		
17:17	17:57		19:30	38 08:34 (43)	20:04	20:37	38 07:04 (101)	20:58	27 07:03 (101)		
22 07:41	07:05		07:19	07:56 (43)	06:27	05:50	06:27 (101)	05:41	06:37 (101)		
17:18	17:58		19:31	37 08:33 (43)	20:05	20:38	38 07:05 (101)	20:58	27 07:04 (101)		
23 07:40	07:04		07:17	07:55 (43)	06:25	05:49	06:27 (101)	05:41	06:37 (101)		
17:19	17:59		19:32	38 08:33 (43)	20:06	20:39	38 07:05 (101)	20:58	27 07:04 (101)		
24 07:39	08:14 (41)	07:02	07:15	07:56 (43)	06:24	05:49	06:27 (101)	05:41	06:37 (101)		
17:20	9 08:23 (41)	18:00	19:34	37 08:33 (43)	20:08	20:40	37 07:04 (101)	20:58	27 07:04 (101)		
25 07:39	08:11 (41)	07:01	07:13	07:55 (43)	06:22	05:48	06:27 (101)	05:41	06:38 (101)		
17:22	14 08:25 (41)	18:02	19:35	37 08:32 (43)	20:09	20:41	38 07:05 (101)	20:59	27 07:05 (101)		
26 07:38	08:09 (41)	06:59	07:12	07:55 (43)	06:21	05:47	06:27 (101)	05:42	06:38 (101)		
17:23	18 08:27 (41)	18:03	19:36	36 08:31 (43)	20:10	20:42	38 07:05 (101)	20:59	27 07:05 (101)		
27 07:37	08:08 (41)	06:57	07:10	07:55 (43)	06:19	05:46	06:27 (101)	05:42	06:37 (101)		
17:24	21 08:29 (41)	18:04	19:37	35 08:30 (43)	20:11	20:42	37 07:04 (101)	20:59	28 07:05 (101)		
28 07:36	08:07 (41)	06:56	07:08	07:56 (43)	06:18	05:46	06:28 (101)	05:42	06:38 (101)		
17:25	23 08:30 (41)	18:05	19:38	33 08:29 (43)	20:12	20:43	37 07:05 (101)	20:59	28 07:06 (101)		
29 07:35	08:06 (41)		07:07	07:56 (43)	06:16	05:45	06:28 (101)	05:43	06:38 (101)		
17:27	25 08:31 (41)		19:39	32 08:28 (43)	20:13	20:44	36 07:04 (101)	20:59	28 07:06 (101)		
30 07:34	08:06 (41)		07:05	07:57 (43)	06:15	05:45	06:29 (101)	05:43	06:38 (101)		
17:28	27 08:33 (41)		19:40	29 08:26 (43)	20:14	20:45	36 07:05 (101)	20:59	29 07:07 (101)		
31 07:33	08:05 (41)		07:03	07:58 (43)		05:44	06:29 (101)				
17:29	28 08:33 (41)		19:42	26 08:24 (43)		20:46	35 07:04 (101)				
Potential sun hours	294	295	370	401	452	457					
Total, worst case	165	498	651	54	911	881					
Sun reduction	0.31	0.38	0.46	0.51	0.56	0.65					
Oper. time red.	1.00	1.00	1.00	1.00	1.00	1.00					
Wind dir. red.	0.58	0.58	0.60	0.60	0.67	0.67					
Total reduction	0.18	0.22	0.27	0.30	0.37	0.43					
Total, real	29	108	177	16	337	378					

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 109

Licensed user:

EDR

217 Montgomery St.

US-SYRACUSE, NY 13202

(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 232 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1392)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	July		August		September		October		November		December				
1	05:44		06:38 (101)	06:09		06:40 (101)	06:42		07:14		07:47 (43)	06:50		07:34 (41)	07:27
	20:59	29	07:07 (101)	20:39	32	07:12 (101)	19:53		19:00	19	08:06 (43)	17:12	32	08:06 (41)	16:46
2	05:44		06:38 (101)	06:10		06:41 (101)	06:43		07:15		07:50 (43)	06:51		07:34 (41)	07:28
	20:59	30	07:08 (101)	20:38	31	07:12 (101)	19:51		18:59	12	08:02 (43)	17:10	32	08:06 (41)	16:46
3	05:45		06:37 (101)	06:11		06:42 (101)	06:44		07:16			06:53		07:34 (41)	07:29
	20:58	31	07:08 (101)	20:37	29	07:11 (101)	19:49		18:57			17:09	32	08:06 (41)	16:45
4	05:45		06:38 (101)	06:12		06:42 (101)	06:45		07:17			06:54		07:34 (41)	07:30
	20:58	31	07:09 (101)	20:36	27	07:09 (101)	19:48		18:55			17:08	32	08:06 (41)	16:45
5	05:46		06:37 (101)	06:13		06:43 (101)	06:46		07:18			06:55		07:33 (41)	07:31
	20:58	32	07:09 (101)	20:35	24	07:07 (101)	19:46		18:53			17:07	33	08:06 (41)	16:45
6	05:47		06:38 (101)	06:14		06:44 (101)	06:47		07:19			06:56		07:34 (41)	07:32
	20:58	32	07:10 (101)	20:33	22	07:06 (101)	19:44		18:52			17:06	33	08:07 (41)	16:45
7	05:47		06:37 (101)	06:15		06:46 (101)	06:48		07:20			06:58		07:34 (41)	07:33
	20:57	32	07:09 (101)	20:32	18	07:04 (101)	19:43		18:50			17:04	32	08:06 (41)	16:45
8	05:48		06:37 (101)	06:16		06:48 (101)	06:49		07:22			06:59		07:34 (41)	07:34
	20:57	33	07:10 (101)	20:31	13	07:01 (101)	19:41		18:48			17:03	32	08:06 (41)	16:45
9	05:49		06:37 (101)	06:17			06:50					07:00		07:35 (41)	07:35
	20:57	34	07:11 (101)	20:29			19:39	11	07:59 (43)			17:23			
10	05:49		06:37 (101)	06:18			06:51		07:55 (43)			17:24		08:06 (41)	16:45
	20:56	34	07:11 (101)	20:28			19:37	18	08:13 (43)			17:01	29	08:05 (41)	16:45
11	05:50		06:37 (101)	06:20			06:52		07:52 (43)			17:25		07:36 (41)	07:36
	20:56	34	07:11 (101)	20:27			19:36	23	08:15 (43)			17:00	28	08:04 (41)	16:45
12	05:51		06:37 (101)	06:21			06:53		07:50 (43)			17:26		07:37 (41)	07:37
	20:55	35	07:12 (101)	20:25			19:34	26	08:16 (43)			16:59	27	08:04 (41)	16:45
13	05:52		06:37 (101)	06:22			06:54		07:48 (43)			17:27		07:38 (41)	07:38
	20:55	36	07:13 (101)	20:24			19:32	29	08:17 (43)			16:58	25	08:03 (41)	16:45
14	05:52		06:36 (101)	06:23			06:56		07:47 (43)			17:28		07:39 (41)	07:39
	20:54	36	07:12 (101)	20:23			19:30	31	08:18 (43)			16:57	23	08:02 (41)	16:45
15	05:53		06:36 (101)	06:24			06:57		07:46 (43)			17:30		07:41 (41)	07:39
	20:54	37	07:13 (101)	20:21			19:29	33	08:19 (43)			16:56	21	08:02 (41)	16:45
16	05:54		06:37 (101)	06:25			06:58		07:44 (43)			17:31		07:42 (41)	07:40
	20:53	36	07:13 (101)	20:20			19:27	35	08:19 (43)			16:55	18	08:00 (41)	16:46
17	05:55		06:37 (101)	06:26			06:59		07:43 (43)			17:32		07:44 (41)	07:41
	20:53	37	07:14 (101)	20:18			19:25	36	08:19 (43)			16:54	14	07:58 (41)	16:46
18	05:56		06:37 (101)	06:27			07:00		07:43 (43)			17:33		07:48 (41)	07:42
	20:52	37	07:14 (101)	20:17			19:23	36	08:19 (43)			16:54	9	07:57 (41)	16:46
19	05:57		06:37 (101)	06:28			07:01		07:42 (43)			17:34			07:42
	20:51	38	07:15 (101)	20:15			19:21	37	08:19 (43)			16:53			16:47
20	05:58		06:36 (101)	06:29			07:02		07:41 (43)			17:35			07:43
	20:50	38	07:14 (101)	20:14			19:20	38	08:19 (43)			16:52			16:47
21	05:58		06:36 (101)	06:30			07:03		07:41 (43)			17:37			07:43
	20:50	38	07:14 (101)	20:12			19:18	38	08:19 (43)			16:51			16:47
22	05:59		06:36 (101)	06:31			07:04		07:41 (43)			17:38			07:44
	20:49	38	07:14 (101)	20:11			19:16	37	08:18 (43)			16:51			16:48
23	06:00		06:37 (101)	06:32			07:05		07:41 (43)			17:39			07:44
	20:48	38	07:15 (101)	20:09			19:14	36	08:17 (43)			16:50			16:48
24	06:01		06:37 (101)	06:33			07:06		07:41 (43)			17:40			07:45
	20:47	38	07:15 (101)	20:08			19:13	36	08:17 (43)		11	08:55 (41)			16:49
25	06:02		06:37 (101)	06:34			07:07		07:42 (43)			17:41			07:45
	20:46	38	07:15 (101)	20:06			19:11	35	08:17 (43)		17	08:59 (41)			16:50
26	06:03		06:37 (101)	06:35			07:08		07:42 (43)			17:43			07:46
	20:45	38	07:15 (101)	20:04			19:09	34	08:16 (43)		20	09:00 (41)			16:50
27	06:04		06:38 (101)	06:36			07:09		07:42 (43)			17:44			07:46
	20:44	36	07:14 (101)	20:03			19:07	32	08:14 (43)		23	09:01 (41)			16:51
28	06:05		06:38 (101)	06:38			07:11		07:43 (43)			17:45			07:46
	20:43	36	07:14 (101)	20:01			19:06	30	08:13 (43)		26	09:03 (41)			16:52
29	06:06		06:39 (101)	06:39			07:12		07:44 (43)			17:46			07:46
	20:42	35	07:14 (101)	20:00			19:04	27	08:11 (43)		28	09:04 (41)			16:52
30	06:07		06:39 (101)	06:40			07:13		07:45 (43)			17:48			07:47
	20:41	35	07:14 (101)	19:56			19:02	24	08:09 (43)		29	09:04 (41)			16:53
31	06:08		06:40 (101)	06:41					07:49			08:35 (41)			07:47
	20:40	33	07:13 (101)	19:55					18:13	30		09:05 (41)			16:54
Potential sun hours	464			431			375		343			294			283
Total, worst case		1085		196			682		215			483			
Sun reduction		0.67		0.64			0.57		0.50			0.29			
Oper. time red.		1.00		1.00			1.00		1.00			1.00			
Wind dir. red.		0.67		0.67			0.60		0.58			0.58			
Total reduction		0.44		0.42			0.30		0.29			0.17			
Total, real		480		83			234		62			80			

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 110

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Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 233 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1393)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	January		February		March		April		May		June				
1	07:47		08:10 (11)	07:32	06:54		07:01		17:31 (15)	06:14	19:14 (16)	05:43	19:09 (16)		
	16:55	27	08:37 (11)	17:31	18:06		19:42	61	18:32 (15)	20:15	24	19:38 (16)	20:46	37	19:46 (16)
2	07:47		08:10 (11)	07:31	06:52		06:59		17:32 (15)	06:12		19:12 (16)	05:43		19:09 (16)
	16:56	27	08:37 (11)	17:32	18:08		19:44	61	18:33 (15)	20:16	27	19:39 (16)	20:47	36	19:45 (16)
3	07:47		08:10 (11)	07:30	06:51		06:58		17:32 (15)	06:11		19:11 (16)	05:42		19:10 (16)
	16:57	28	08:38 (11)	17:33	18:09		19:45	60	18:32 (15)	20:17	30	19:41 (16)	20:48	35	19:45 (16)
4	07:47		08:10 (11)	07:29	06:49		06:56		17:32 (15)	06:10		19:10 (16)	05:42		19:10 (16)
	16:58	28	08:38 (11)	17:35	18:10		19:46	59	18:31 (15)	20:18	32	19:42 (16)	20:49	34	19:44 (16)
5	07:47		08:10 (11)	07:28	06:48		06:54		17:33 (15)	06:08		19:09 (16)	05:42		19:11 (16)
	16:59	29	08:39 (11)	17:36	18:11		19:47	57	18:30 (15)	20:20	34	19:43 (16)	20:49	33	19:44 (16)
6	07:47		08:11 (11)	07:26	06:46		06:53		17:33 (15)	06:07		19:07 (16)	05:41		19:12 (16)
	17:00	28	08:39 (11)	17:37	18:12		19:48	56	18:29 (15)	20:21	36	19:43 (16)	20:50	32	19:44 (16)
7	07:47		08:11 (11)	07:25	06:44		06:51		17:34 (15)	06:06		19:06 (16)	05:41		19:13 (16)
	17:01	28	08:39 (11)	17:38	18:14		19:49	54	18:28 (15)	20:22	38	19:44 (16)	20:51	32	19:45 (16)
8	07:47		08:11 (11)	07:24	07:43		06:49		17:35 (15)	06:05		19:06 (16)	05:41		19:12 (16)
	17:02	29	08:40 (11)	17:40	19:15		19:50	52	18:27 (15)	20:23	39	19:45 (16)	20:52	34	20:18 (114)
9	07:46		08:12 (11)	07:23	07:41	17:58 (15)	06:48		17:36 (15)	06:03		19:05 (16)	05:40		19:13 (16)
	17:03	28	08:40 (11)	17:41	19:16	19	18:17 (15)	50	18:26 (15)	20:24	40	19:45 (16)	20:52	38	20:21 (114)
10	07:46		08:13 (11)	07:22	07:39	17:54 (15)	06:46		17:36 (15)	06:02		19:05 (16)	05:40		19:14 (16)
	17:04	28	08:41 (11)	17:42	19:17	28	18:22 (15)	48	18:24 (15)	20:25	41	19:46 (16)	20:53	40	20:23 (114)
11	07:46		08:13 (11)	07:20	07:38	17:51 (15)	06:44		17:38 (15)	06:01		19:05 (16)	05:40		19:14 (16)
	17:05	27	08:40 (11)	17:44	19:18	33	18:24 (15)	45	18:23 (15)	20:26	41	19:46 (16)	20:53	42	20:24 (114)
12	07:46		08:14 (11)	07:19	07:36	17:48 (15)	06:43		17:39 (15)	06:00		19:05 (16)	05:40		19:15 (16)
	17:06	27	08:41 (11)	17:45	19:20	38	18:26 (15)	42	18:21 (15)	20:27	42	19:47 (16)	20:54	42	20:25 (114)
13	07:45		08:14 (11)	07:18	07:34	17:47 (15)	06:41		17:40 (15)	05:59		19:04 (16)	05:40		19:16 (16)
	17:07	27	08:41 (11)	17:46	19:21	41	18:28 (15)	39	18:19 (15)	20:28	43	19:47 (16)	20:54	42	20:26 (114)
14	07:45		08:15 (11)	07:16	07:32	17:44 (15)	06:39		17:42 (15)	05:58		19:04 (16)	05:40		19:16 (16)
	17:08	26	08:41 (11)	17:48	19:22	45	18:29 (15)	36	18:18 (15)	20:29	43	19:47 (16)	20:55	43	20:27 (114)
15	07:44		08:16 (11)	07:15	07:31	17:42 (15)	06:38		17:44 (15)	05:57		19:04 (16)	05:40		19:17 (16)
	17:09	26	08:42 (11)	17:49	19:23	48	18:30 (15)	31	18:15 (15)	20:30	43	19:47 (16)	20:55	43	20:27 (114)
16	07:44		08:16 (11)	07:14	07:29	17:41 (15)	06:36		17:47 (15)	05:56		19:04 (16)	05:40		19:17 (16)
	17:10	25	08:41 (11)	17:50	19:24	50	18:31 (15)	26	18:13 (15)	20:31	43	19:47 (16)	20:56	44	20:28 (114)
17	07:44		08:17 (11)	07:12	07:27	17:40 (15)	06:34		17:50 (15)	05:55		19:04 (16)	05:40		19:17 (16)
	17:12	24	08:41 (11)	17:51	19:25	53	18:33 (15)	19	18:09 (15)	20:32	43	19:47 (16)	20:56	43	20:28 (114)
18	07:43		08:18 (11)	07:11	07:26	17:38 (15)	06:33		17:54 (15)	05:54		19:04 (16)	05:40		19:17 (16)
	17:13	23	08:41 (11)	17:53	19:27	55	18:33 (15)	9	18:03 (15)	20:34	43	19:47 (16)	20:57	43	20:28 (114)
19	07:42		08:19 (11)	07:09	07:24	17:37 (15)	06:31			05:53		19:04 (16)	05:40		19:18 (16)
	17:14	21	08:40 (11)	17:54	19:28	57	18:34 (15)			20:35	43	19:47 (16)	20:57	42	20:28 (114)
20	07:42		08:20 (11)	07:08	07:22	17:36 (15)	06:30			05:52		19:04 (16)	05:40		19:18 (16)
	17:15	19	08:39 (11)	17:55	19:29	58	18:34 (15)			20:36	43	19:47 (16)	20:57	43	20:29 (114)
21	07:41		08:22 (11)	07:06	07:20	17:36 (15)	06:28			05:51		19:04 (16)	05:40		19:18 (16)
	17:16	17	08:39 (11)	17:56	19:30	59	18:35 (15)			20:37	43	19:47 (16)	20:57	43	20:29 (114)
22	07:40		08:23 (11)	07:05	07:19	17:35 (15)	06:27			05:50		19:05 (16)	05:41		19:19 (16)
	17:18	15	08:38 (11)	17:58	19:31	60	18:35 (15)			20:37	42	19:47 (16)	20:58	43	20:30 (114)
23	07:40		08:25 (11)	07:03	07:17	17:34 (15)	06:25			05:49		19:05 (16)	05:41		19:19 (16)
	17:19	11	08:36 (11)	17:59	19:32	61	18:35 (15)			20:38	42	19:47 (16)	20:58	43	20:30 (114)
24	07:39			07:02	07:15	17:33 (15)	06:24			05:48		19:05 (16)	05:41		19:19 (16)
	17:20			18:00	19:33	62	18:35 (15)			20:39	42	19:47 (16)	20:58	42	20:29 (114)
25	07:38			07:00	07:13	17:33 (15)	06:22			05:48		19:05 (16)	05:41		19:18 (16)
	17:22			18:01	19:35	62	18:35 (15)			20:40	41	19:46 (16)	20:58	43	20:29 (114)
26	07:37			06:59	07:12	17:32 (15)	06:21			05:47		19:06 (16)	05:42		19:19 (16)
	17:23			18:03	19:36	63	18:35 (15)			20:41	41	19:47 (16)	20:58	43	20:30 (114)
27	07:37			06:57	07:10	17:32 (15)	06:19			05:46		19:06 (16)	05:42		19:19 (16)
	17:24			18:04	19:37	63	18:35 (15)			20:42	40	19:46 (16)	20:58	43	20:29 (114)
28	07:36			06:56	07:08	17:31 (15)	06:18			05:46		19:07 (16)	05:42		19:19 (16)
	17:25			18:05	19:38	63	18:34 (15)			20:43	39	19:46 (16)	20:58	44	20:30 (114)
29	07:35				07:06	17:32 (15)	06:16		19:19 (16)	05:45		19:07 (16)	05:43		19:19 (16)
	17:27				19:39	63	18:35 (15)	14	19:33 (16)	20:44	39	19:46 (16)	20:58	42	20:29 (114)
30	07:34				07:05	17:32 (15)	06:15		19:16 (16)	05:44		19:08 (16)	05:43		19:18 (16)
	17:28				19:40	62	18:34 (15)	20	19:36 (16)	20:45	38	19:46 (16)	20:58	42	20:28 (114)
31	07:33				07:03	17:31 (15)				05:44		19:08 (16)			
	17:29				19:41	62	18:33 (15)			20:46	37	19:45 (16)			
Potential sun hours	294		295	370		401		452			457				
Total, worst case		568			1205		839		1212				1206		
Sun reduction	0.31				0.46		0.51		0.56				0.65		
Oper. time red.	1.00				1.00		1.00		1.00				1.00		
Wind dir. red.	0.57				0.64		0.64		0.58				0.58		
Total reduction	0.18				0.29		0.32		0.33				0.38		
Total, real	101				353		272		396				456		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 111

Licensed user:

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Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 233 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1393)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	July		August		September		October		November		December						
1	05:44		19:19 (16)	06:09		19:14 (16)	06:42		17:37 (15)	07:14		17:27 (15)	06:50		07:26	07:55 (11)	
	20:58	41	20:28 (114)	20:39	42	19:56 (16)	19:53	45	18:22 (15)	19:00	39	18:06 (15)	17:12		16:46	27	08:22 (11)
2	05:44		19:18 (16)	06:10		19:15 (16)	06:43		17:35 (15)	07:15		17:29 (15)	06:51		07:27	07:55 (11)	
	20:58	40	20:27 (114)	20:38	41	19:56 (16)	19:51	48	18:23 (15)	18:58	35	18:04 (15)	17:10		16:46	28	08:23 (11)
3	05:45		19:18 (16)	06:11		19:15 (16)	06:44		17:34 (15)	07:16		17:31 (15)	06:52		07:28	07:56 (11)	
	20:58	39	20:27 (114)	20:37	40	19:55 (16)	19:49	50	18:24 (15)	18:57	30	18:01 (15)	17:09		16:45	28	08:24 (11)
4	05:45		19:19 (16)	06:12		19:15 (16)	06:45		17:32 (15)	07:17		17:34 (15)	06:54		07:29	07:56 (11)	
	20:58	36	20:26 (114)	20:35	40	19:55 (16)	19:48	52	18:24 (15)	18:55	23	17:57 (15)	17:08		16:45	29	08:25 (11)
5	05:46		19:18 (16)	06:13		19:16 (16)	06:46		17:31 (15)	07:18		17:39 (15)	06:55		07:30	07:57 (11)	
	20:58	32	19:50 (16)	20:34	38	19:54 (16)	19:46	54	18:25 (15)	18:53	12	17:51 (15)	17:07		16:45	28	08:25 (11)
6	05:47		19:18 (16)	06:14		19:16 (16)	06:47		17:30 (15)	07:19		17:30 (15)	06:56		07:31	07:57 (11)	
	20:57	33	19:51 (16)	20:33	37	19:53 (16)	19:44	55	18:25 (15)	18:52		17:05			16:45	28	08:25 (11)
7	05:47		19:17 (16)	06:15		19:17 (16)	06:48		17:28 (15)	07:20		17:04			07:32	07:57 (11)	
	20:57	33	19:50 (16)	20:32	36	19:53 (16)	19:42	57	18:25 (15)	18:50		17:04			16:45	29	08:26 (11)
8	05:48		19:17 (16)	06:16		19:18 (16)	06:49		17:27 (15)	07:21		17:03			07:33	07:58 (11)	
	20:57	34	19:51 (16)	20:31	34	19:52 (16)	19:41	59	18:26 (15)	18:48		17:03			16:45	28	08:26 (11)
9	05:49		19:17 (16)	06:17		19:19 (16)	06:50		17:26 (15)	07:23		17:00			07:34	07:58 (11)	
	20:56	35	19:52 (16)	20:29	31	19:50 (16)	19:39	60	18:26 (15)	18:46		17:02			16:45	28	08:26 (11)
10	05:49		19:17 (16)	06:18		19:20 (16)	06:51		17:25 (15)	07:24		17:01			07:35	07:59 (11)	
	20:56	35	19:52 (16)	20:28	29	19:49 (16)	19:37	61	18:26 (15)	18:45		17:01			16:45	27	08:26 (11)
11	05:50		19:17 (16)	06:19		19:21 (16)	06:52		17:24 (15)	07:25		17:02			07:36	08:00 (11)	
	20:56	36	19:53 (16)	20:27	26	19:47 (16)	19:35	62	18:26 (15)	18:43		17:00			16:45	27	08:27 (11)
12	05:51		19:17 (16)	06:20		19:23 (16)	06:53		17:24 (15)	07:26		17:04			07:37	08:01 (11)	
	20:55	37	19:54 (16)	20:25	23	19:46 (16)	19:34	61	18:25 (15)	18:41		16:59			16:45	26	08:27 (11)
13	05:52		19:17 (16)	06:22		19:25 (16)	06:54		17:23 (15)	07:27		17:05			07:38	08:02 (11)	
	20:55	37	19:54 (16)	20:24	18	19:43 (16)	19:32	62	18:25 (15)	18:40		16:58			16:45	26	08:28 (11)
14	05:52		19:16 (16)	06:23		19:28 (16)	06:55		17:22 (15)	07:28		17:06			07:38	08:03 (11)	
	20:54	38	19:54 (16)	20:22	11	19:39 (16)	19:30	63	18:25 (15)	18:38		16:57			16:45	26	08:29 (11)
15	05:53		19:16 (16)	06:24		19:22 (15)	07:29		17:22 (15)	07:29		17:07			07:39	08:03 (11)	
	20:54	39	19:55 (16)	20:21		19:28		63	18:25 (15)	18:37		16:56			16:45	25	08:28 (11)
16	05:54		19:16 (16)	06:25		19:28			17:21 (15)	07:31		17:09			07:40	08:04 (11)	
	20:53	39	19:55 (16)	20:20		19:27		63	18:24 (15)	18:35		16:55			16:46	25	08:29 (11)
17	05:55		19:16 (16)	06:26		19:25			17:21 (15)	07:32		17:10			07:41	08:05 (11)	
	20:52	40	19:56 (16)	20:18		19:25		62	18:23 (15)	18:33		16:54			16:46	25	08:30 (11)
18	05:56		19:16 (16)	06:27		19:23			17:20 (15)	07:33		17:11			07:41	08:05 (11)	
	20:52	40	19:56 (16)	20:17		19:23		63	18:23 (15)	18:32		16:53			16:46	25	08:30 (11)
19	05:57		19:14 (16)	06:28		19:21			17:20 (15)	07:34		17:12		08:00 (11)	07:42	08:06 (11)	
	20:51	42	19:56 (16)	20:15		19:21		62	18:22 (15)	18:30		16:53	11	08:11 (11)	16:47	24	08:30 (11)
20	05:57		19:14 (16)	06:29		19:20			17:20 (15)	07:35		17:14		07:58 (11)	07:42	08:06 (11)	
	20:50	42	19:56 (16)	20:14		19:20		61	18:21 (15)	18:29		16:52	15	08:13 (11)	16:47	24	08:30 (11)
21	05:58		19:14 (16)	06:30		19:18			17:20 (15)	07:36		17:15		07:57 (11)	07:43	08:07 (11)	
	20:49	43	19:57 (16)	20:12		19:18		60	18:20 (15)	18:27		16:51	17	08:14 (11)	16:47	24	08:31 (11)
22	05:59		19:14 (16)	06:31		19:16			17:20 (15)	07:38		17:16		07:57 (11)	07:44	08:07 (11)	
	20:49	43	19:57 (16)	20:11		19:16		60	18:20 (15)	18:26		16:50	19	08:16 (11)	16:48	24	08:31 (11)
23	06:00		19:14 (16)	06:32		19:14			17:20 (15)	07:39		17:17		07:56 (11)	07:44	08:08 (11)	
	20:48	43	19:57 (16)	20:09		19:14		58	18:18 (15)	18:24		16:50	21	08:17 (11)	16:48	24	08:32 (11)
24	06:01		19:14 (16)	06:33		19:12			17:20 (15)	07:40		17:18		07:55 (11)	07:44	08:08 (11)	
	20:47	43	19:57 (16)	20:07		19:12		57	18:17 (15)	18:23		16:49	23	08:18 (11)	16:49	24	08:32 (11)
25	06:02		19:14 (16)	06:34		17:57 (15)	07:07		17:21 (15)	07:41		17:19		07:55 (11)	07:45	08:09 (11)	
	20:46	44	19:58 (16)	20:06	11	18:08 (15)	19:11	55	18:16 (15)	18:21		16:49	24	08:19 (11)	16:50	24	08:33 (11)
26	06:03		19:14 (16)	06:35		17:52 (15)	07:08		17:21 (15)	07:42		17:21		07:54 (11)	07:45	08:09 (11)	
	20:45	44	19:58 (16)	20:04	21	18:13 (15)	19:09	54	18:15 (15)	18:20		16:48	25	08:19 (11)	16:50	25	08:34 (11)
27	06:04		19:15 (16)	06:36		17:48 (15)	07:09		17:23 (15)	07:44		17:22		07:55 (11)	07:46	08:09 (11)	
	20:44	43	19:58 (16)	20:03	27	18:15 (15)	19:07	51	18:14 (15)	18:18		16:48	26	08:21 (11)	16:51	25	08:34 (11)
28	06:05		19:15 (16)	06:37		17:46 (15)	07:10		17:23 (15)	07:45		17:23		07:55 (11)	07:46	08:09 (11)	
	20:43	43	19:58 (16)	20:01	31	18:17 (15)	19:05	49	18:12 (15)	18:17		16:47	26	08:21 (11)	16:52	25	08:34 (11)
29	06:06		19:15 (16)	06:38		17:43 (15)	07:11		17:24 (15)	07:46		17:24		07:55 (11)	07:46	08:10 (11)	
	20:42	43	19:58 (16)	19:58	36	18:19 (15)	19:04	47	18:11 (15)	18:16		16:47	27	08:22 (11)	16:52	25	08:35 (11)
30	06:07		19:15 (16)	06:40		17:41 (15)	07:13		17:25 (15)	07:47		17:25		07:55 (11)	07:46	08:10 (11)	
	20:41	43	19:58 (16)	19:56	39	18:20 (15)	19:02	43	18:08 (15)	18:14		16:46	27	08:22 (11)	16:53	26	08:36 (11)
31	06:08		19:14 (16)	06:41		17:39 (15)			17:25 (15)	07:49		17:25		07:55 (11)	07:47	08:10 (11)	
	20:40	42	19:56 (16)	19:54	42	18:21 (15)			18:13			16:54	27	08:22 (11)	16:54	26	08:36 (11)
Potential sun hours	463			431			375		343			294			283		
Total, worst case		1222				653		1697		139		261				805	
Sun reduction		0.67				0.64		0.57		0.50		0.29				0.27	
Oper. time red.		1.00				1.00		1.00		1.00		1.00				1.00	
Wind dir. red.		0.58				0.60		0.64		0.64		0.57				0.57	
Total reduction		0.39				0.38		0.36		0.32		0.17				0.15	
Total, real		478				251		616		44		43				124	

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 113

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Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 236 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1395)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

January		February		March		April		May		June	
1 07:47		07:32		07:53 (33) 06:54		17:07 (115) 07:01		06:14		19:18 (112) 05:43	
16:55		17:31	18	08:11 (33) 18:06	36	17:43 (115) 19:43		20:15	35	19:53 (112) 20:47	
2 07:47		07:31		07:52 (33) 06:53		17:06 (115) 07:00		06:12		19:18 (112) 05:43	
16:56		17:32	20	08:12 (33) 18:08	37	17:43 (115) 19:44		20:16	34	19:52 (112) 20:47	
3 07:47		07:30		07:51 (33) 06:51		17:06 (115) 06:58		06:11		19:18 (112) 05:42	
16:57		17:33	22	08:13 (33) 18:09	38	17:44 (115) 19:45		20:18	34	19:52 (112) 20:48	
4 07:47		07:29		07:50 (33) 06:49		17:06 (115) 06:56		06:10		19:18 (112) 05:42	
16:58		17:35	24	08:14 (33) 18:10	38	17:44 (115) 19:46		20:19	34	19:52 (112) 20:49	
5 07:47		07:28		07:48 (33) 06:48		17:05 (115) 06:54		06:08		19:18 (112) 05:42	
16:59		17:36	26	08:14 (33) 18:11	39	17:44 (115) 19:47		20:20	34	19:52 (112) 20:50	
6 07:47		07:27		07:47 (33) 06:46		17:05 (115) 06:53		06:07		19:18 (112) 05:41	
17:00		17:37	28	08:15 (33) 18:13	39	17:44 (115) 19:48		20:21	33	19:51 (112) 20:50	
7 07:47		07:25		07:46 (33) 06:44		17:05 (115) 06:51		06:06		19:18 (112) 05:41	
17:01		17:38	29	08:15 (33) 18:14	38	17:43 (115) 19:49	4	07:14 (32)	33	19:51 (112) 20:51	
8 07:47		07:24		07:45 (33) 07:43		18:05 (115) 06:49		07:09 (32)		19:19 (112) 05:41	
17:02		17:40	31	08:16 (33) 19:15	38	18:43 (115) 19:51	7	07:16 (32)	31	19:50 (112) 20:52	
9 07:47		07:23		07:43 (33) 07:41		18:06 (115) 06:48		07:07 (32)		19:20 (112) 05:40	
17:03		17:41	33	08:16 (33) 19:16	37	18:43 (115) 19:52	10	07:17 (32)	30	19:50 (112) 20:52	
10 07:46		07:22		07:42 (33) 07:39		18:06 (115) 06:46		07:05 (32)		19:20 (112) 05:40	
17:04		17:42	34	08:16 (33) 19:17	36	18:42 (115) 19:53	12	07:17 (32)	29	19:49 (112) 20:53	
11 07:46		07:20		07:41 (33) 07:38		18:06 (115) 06:44		07:04 (32)		19:21 (112) 05:40	
17:05		17:44	35	08:16 (33) 19:18	34	18:40 (115) 19:54	14	07:18 (32)	28	19:49 (112) 20:54	
12 07:46		07:19		07:39 (33) 07:36		18:07 (115) 06:43		07:02 (32)		19:22 (112) 05:40	
17:06		17:45	37	08:16 (33) 19:20	32	18:39 (115) 19:55	16	07:18 (32)	26	19:48 (112) 20:54	
13 07:45		07:18		07:40 (33) 07:34		18:08 (115) 06:41		07:00 (32)		19:23 (112) 05:40	
17:07		17:46	36	08:16 (33) 19:21	30	18:38 (115) 19:56	18	07:18 (32)	24	19:47 (112) 20:55	
14 07:45		07:16		07:40 (33) 07:32		18:09 (115) 06:39		06:59 (32)		19:24 (112) 05:40	
17:08		17:48	36	08:16 (33) 19:22	27	18:36 (115) 19:57	20	07:19 (32)	22	19:46 (112) 20:55	
15 07:45		07:15		07:40 (33) 07:31		18:10 (115) 06:38		06:57 (32)		19:26 (112) 05:40	
17:09		17:49	35	08:15 (33) 19:23	24	18:34 (115) 19:58	21	07:18 (32)	18	19:44 (112) 20:56	
16 07:44		07:14		07:41 (33) 07:29		18:13 (115) 06:36		06:56 (32)		19:27 (112) 05:40	
17:10		17:50	33	08:14 (33) 19:24	19	18:32 (115) 20:00	22	07:18 (32)	15	19:42 (112) 20:56	
17 07:44		07:12		07:41 (33) 07:27		18:16 (115) 06:34		06:54 (32)		19:30 (112) 05:40	
17:12		17:51	32	08:13 (33) 19:25	13	18:29 (115) 20:00	24	07:18 (32)	10	19:40 (112) 20:56	
18 07:43		07:11		07:43 (33) 07:26		06:33		06:52 (32)		05:40	
17:13		17:53	29	08:12 (33) 19:27		20:01	25	07:17 (32)		20:57	
19 07:43		07:09		07:44 (33) 07:24		06:31		06:51 (32)		05:40	
17:14		17:54	28	08:12 (33) 19:28		20:02	25	07:16 (32)		20:57	
20 07:42		07:08		07:45 (33) 07:22		06:30		06:49 (32)		05:40	
17:15		17:55	25	08:10 (33) 19:29		20:03	36	19:41 (112)		20:57	
21 07:41		07:07		07:47 (33) 07:20		06:28		06:48 (32)		05:40	
17:17		17:57	29	17:31 (115) 19:30		20:04	41	19:42 (112)		20:58	
22 07:41		07:05		07:49 (33) 07:19		06:27		06:48 (32)		05:41	
17:18		17:58	33	17:35 (115) 19:31		20:05	42	18:43 (112)		20:58	
23 07:40		07:04		07:54 (33) 07:17		06:25		06:49 (32)		05:41	
17:19		17:59	28	17:37 (115) 19:32		20:06	43	19:44 (112)		20:58	
24 07:39		07:02		17:13 (115) 07:15		06:24		06:50 (32)		05:41	
17:20		18:00	25	17:38 (115) 19:34		20:07	43	19:45 (112)		20:58	
25 07:38		07:00		17:11 (115) 07:13		06:22		06:52 (32)		05:41	
17:22		18:02	28	17:39 (115) 19:35		20:09	41	19:46 (112)		20:58	
26 07:38		06:59		17:10 (115) 07:12		06:21		06:54 (32)		05:42	
17:23		18:03	31	17:41 (115) 19:36		20:10	40	19:48 (112)		20:59	
27 07:37		07:58 (33) 06:57		17:09 (115) 07:10		06:19		19:20 (112)		05:42	
17:24	3	08:01 (33) 18:04	32	17:41 (115) 19:37		20:11	28	19:48 (112)		20:59	
28 07:36		07:57 (33) 06:56		17:09 (115) 07:08		06:18		19:20 (112)		05:42	
17:25	7	08:04 (33) 18:05	34	17:43 (115) 19:38		20:12	30	19:50 (112)		20:59	
29 07:35		07:56 (33)		07:06		06:16		19:18 (112)		05:43	
17:27	10	08:06 (33)		19:39		20:13	32	19:50 (112)		20:59	
30 07:34		07:55 (33)		07:05		06:15		19:18 (112)		05:43	
17:28	13	08:08 (33)		19:40		20:14	34	19:52 (112)		20:59	
31 07:33		07:54 (33)		07:03				05:44			
17:29	16	08:10 (33)		19:41				20:46			
Potential sun hours	294		295		370		401		452		457
Total, worst case	49		831		555		628		470		
Sun reduction	0.31		0.38		0.46		0.51		0.56		
Oper. time red.	1.00		1.00		1.00		1.00		1.00		
Wind dir. red.	0.58		0.60		0.65		0.61		0.58		
Total reduction	0.18		0.23		0.30		0.31		0.33		
Total, real	9		190		167		196		154		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker
			(WTG causing flicker last time)

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 114

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Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 236 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1395)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	July		August		September		October		November		December	
1	05:44		06:09	19:31 (112)	06:42		07:03 (32)	07:14	17:47 (115)	06:50	07:12 (33)	07:26
	20:59		20:39	27 19:58 (112)	19:53	14	07:17 (32)	19:00	31 18:18 (115)	17:12	34 07:46 (33)	16:46
2	05:44		06:10	19:30 (112)	06:43		07:04 (32)	07:15	17:45 (115)	06:51	07:13 (33)	07:28
	20:58		20:38	28 19:58 (112)	19:51	12	07:16 (32)	18:58	34 18:19 (115)	17:10	32 07:45 (33)	16:46
3	05:45		06:11	19:30 (112)	06:44		07:05 (32)	07:16	17:44 (115)	06:53	07:14 (33)	07:29
	20:58		20:37	29 19:59 (112)	19:49	10	07:15 (32)	18:57	35 18:19 (115)	17:09	31 07:45 (33)	16:45
4	05:45		06:12	19:29 (112)	06:45		07:06 (32)	07:17	17:43 (115)	06:54	07:16 (33)	07:30
	20:58		20:36	31 20:00 (112)	19:48	7	07:13 (32)	18:55	36 18:19 (115)	17:08	29 07:45 (33)	16:45
5	05:46		06:13	19:28 (112)	06:46		07:07 (32)	07:18	17:42 (115)	06:55	07:17 (33)	07:31
	20:58		20:34	32 20:00 (112)	19:46	4	07:11 (32)	18:53	37 18:19 (115)	17:07	28 07:45 (33)	16:45
6	05:47		06:14	19:28 (112)	06:47			07:19	17:42 (115)	06:56	07:19 (33)	07:32
	20:58		20:33	32 20:00 (112)	19:44			18:52	38 18:20 (115)	17:05	26 07:45 (33)	16:45
7	05:47		06:15	19:27 (112)	06:48			07:20	17:41 (115)	06:58	07:20 (33)	07:33
	20:57		20:32	34 20:01 (112)	19:43			18:50	39 18:20 (115)	17:04	24 07:44 (33)	16:45
8	05:48		06:16	19:27 (112)	06:49			07:22	17:41 (115)	06:59	07:21 (33)	07:34
	20:57		20:31	34 20:01 (112)	19:41			18:48	38 18:19 (115)	17:03	22 07:43 (33)	16:45
9	05:49		06:17	19:27 (112)	06:50			07:23	17:40 (115)	07:00	07:23 (33)	07:34
	20:57		20:29	34 20:01 (112)	19:39			18:47	39 18:19 (115)	17:02	20 07:43 (33)	16:45
10	05:49		06:18	19:26 (112)	06:51			07:24	17:40 (115)	07:01	07:24 (33)	07:35
	20:56		20:28	35 20:01 (112)	19:37			18:45	38 18:18 (115)	17:01	18 07:42 (33)	16:45
11	05:50		06:19	19:26 (112)	06:52			07:25	17:40 (115)	07:03	07:25 (33)	07:36
	20:56		20:27	35 20:01 (112)	19:36			18:43	37 18:17 (115)	17:00	15 07:40 (33)	16:45
12	05:51		06:20	19:26 (112)	06:53			07:26	17:41 (115)	07:04	07:27 (33)	07:37
	20:55		20:25	34 20:00 (112)	19:34			18:42	37 18:18 (115)	16:59	13 07:40 (33)	16:45
13	05:52		06:22	19:26 (112)	06:54			07:27	17:41 (115)	07:05	07:28 (33)	07:38
	20:55		20:24	33 19:59 (112)	19:32			18:40	36 18:17 (115)	16:58	10 07:38 (33)	16:45
14	05:52		06:23	19:26 (112)	06:55			07:28	17:41 (115)	07:06	07:29 (33)	07:39
	20:54		20:23	32 19:58 (112)	19:30			18:38	34 18:15 (115)	16:57	7 07:36 (33)	16:45
15	05:53		06:24	19:26 (112)	06:57			07:30	17:42 (115)	07:08	07:31 (33)	07:39
	20:54		20:21	30 19:56 (112)	19:28			18:37	31 18:13 (115)	16:56	3 07:34 (33)	16:45
16	05:54		06:25	07:05 (32)	06:58			07:31	17:42 (115)	07:09		07:40
	20:53		20:20	33 19:56 (112)	19:27			18:35	29 18:11 (115)	16:55		16:46
17	05:55		06:26	07:00 (32)	06:59			07:32	17:44 (115)	07:10		07:41
	20:52		20:18	40 19:54 (112)	19:25			18:33	27 18:11 (115)	16:54		16:46
18	05:56		06:27	06:58 (32)	07:00			07:33	17:45 (115)	07:11		07:41
	20:52		20:17	42 19:53 (112)	19:23			18:32	24 18:09 (115)	16:53		16:46
19	05:57		06:28	06:56 (32)	07:01			07:34		08:23 (33)	07:12	07:42
	20:51		20:15	43 19:51 (112)	19:21			18:30	30 18:07 (115)	16:53		16:47
20	05:57		06:29	06:54 (32)	07:02			07:35		08:19 (33)	07:14	07:43
	20:50		20:14	44 19:50 (112)	19:20			18:29	31 18:04 (115)	16:52		16:47
21	05:58		06:30	06:53 (32)	07:03			07:37		08:17 (33)	07:15	07:43
	20:50		20:12	42 19:48 (112)	19:18			18:27	22 08:39 (33)	16:51		16:47
22	05:59		06:31	06:53 (32)	07:04			07:38		08:15 (33)	07:16	07:44
	20:49		20:11	41 19:47 (112)	19:16			18:26	26 08:41 (33)	16:50		16:48
23	06:00		06:32	06:54 (32)	07:05			07:39		08:14 (33)	07:17	07:44
	20:48		20:09	35 19:45 (112)	19:14			18:24	28 08:42 (33)	16:50		16:48
24	06:01		06:33	06:55 (32)	07:06			07:40		08:12 (33)	07:18	07:45
	20:47		20:08	25 07:20 (32)	19:13			18:23	30 08:42 (33)	16:49		16:49
25	06:02		06:34	06:56 (32)	07:07			07:41		08:12 (33)	07:20	07:45
	20:46		20:06	24 07:20 (32)	19:11			18:21	32 08:44 (33)	16:49		16:50
26	06:03		06:35	06:57 (32)	07:08		18:00 (115)	07:43		08:11 (33)	07:21	07:45
	20:45	7	19:49 (112)	20:04	23 07:20 (32)	19:09	9	18:09 (115)	18:20	33 08:44 (33)	16:48	16:50
27	06:04		19:39 (112)	06:36		06:58 (32)	07:09	17:55 (115)	07:44		08:10 (33)	07:22
	20:44	13	19:52 (112)	20:03	22 07:20 (32)	19:07	18	18:13 (115)	18:18	34 08:44 (33)	16:48	16:51
28	06:05		19:37 (112)	06:37		06:59 (32)	07:10	17:53 (115)	07:45		08:10 (33)	07:23
	20:43	17	19:54 (112)	20:01	21 07:20 (32)	19:05	22	18:15 (115)	18:17	35 08:45 (33)	16:47	16:52
29	06:06		19:36 (112)	06:39		07:00 (32)	07:12	17:50 (115)	07:46		08:09 (33)	07:24
	20:42	19	19:55 (112)	19:58	19 07:19 (32)	19:04	26	18:16 (115)	18:16	36 08:45 (33)	16:47	16:52
30	06:07		19:34 (112)	06:40		07:01 (32)	07:13	17:48 (115)	07:48		08:09 (33)	07:25
	20:41	23	19:57 (112)	19:56	18 07:19 (32)	19:02	29	18:17 (115)	18:14	36 08:45 (33)	16:46	16:53
31	06:08		19:32 (112)	06:41		07:02 (32)		07:49		08:11 (33)		07:47
	20:40	25	19:57 (112)	19:54	16 07:18 (32)			18:13	35 08:46 (33)			16:54
Potential sun hours	464		431			375		343		294		283
Total, worst case	104		968			151		1028		312		
Sun reduction	0.67		0.64			0.57		0.50		0.29		
Oper. time red.	1.00		1.00			1.00		1.00		1.00		
Wind dir. red.	0.58		0.60			0.65		0.63		0.58		
Total reduction	0.39		0.38			0.37		0.31		0.17		
Total, real	41		372			56		323		53		

Project:

2015-08-31_Arkwright Summit_SFA

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EDR

217 Montgomery St.

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Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 237 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1396)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	January	February	March		April		May		June		July		August		September		October		November	December
1	07:47	07:32	06:54		07:01		18:09 (22)	06:14	05:43	05:44	06:09	06:42				07:14		18:00 (22)	06:50	07:26
	16:55	17:31	18:06		19:43	43	18:52 (22)	20:15	20:47	20:58	20:39	19:53				19:00	29	18:29 (22)	17:12	16:46
2	07:47	07:31	06:53		07:00		18:09 (22)	06:12	05:43	05:44	06:10	06:43				07:15		18:02 (22)	06:51	07:27
	16:56	17:32	18:08		19:44	42	18:51 (22)	20:16	20:47	20:58	20:38	19:51				18:58	25	18:27 (22)	17:10	16:46
3	07:47	07:30	06:51		06:58		18:10 (22)	06:11	05:42	05:45	06:11	06:44				18:19 (22)		18:05 (22)	06:52	07:29
	16:57	17:33	18:09		19:45	39	18:49 (22)	20:17	20:48	20:58	20:37	19:49	14			18:33 (22)	18	18:23 (22)	17:09	16:45
4	07:47	07:29	06:49		06:56		18:11 (22)	06:10	05:42	05:45	06:12	06:45				18:15 (22)		18:10 (22)	06:54	07:30
	16:58	17:35	18:10		19:46	36	18:47 (22)	20:19	20:49	20:58	20:36	19:48	21			18:36 (22)	7	18:17 (22)	17:08	16:45
5	07:47	07:28	06:48		06:54		18:12 (22)	06:08	05:42	05:46	06:13	06:46				18:12 (22)			06:55	07:31
	16:59	17:36	18:11		19:47	34	18:46 (22)	20:20	20:50	20:58	20:34	19:46	26			18:38 (22)			17:07	16:45
6	07:47	07:27	06:46		06:53		18:14 (22)	06:07	05:41	05:47	06:14	06:47				18:10 (22)			06:56	07:32
	17:00	17:37	18:13		19:48	30	18:44 (22)	20:21	20:50	20:58	20:33	19:44	30			18:40 (22)			17:05	16:45
7	07:47	07:25	06:44		06:51		18:15 (22)	06:06	05:41	05:47	06:15	06:48				18:08 (22)			06:57	07:33
	17:01	17:38	18:14		19:49	26	18:41 (22)	20:22	20:51	20:57	20:32	19:43	33			18:41 (22)			17:04	16:45
8	07:47	07:24	07:43		06:49		18:18 (22)	06:05	05:41	05:48	06:16	06:49				18:06 (22)			06:59	07:33
	17:02	17:40	19:15		19:50	21	18:39 (22)	20:23	20:52	20:57	20:31	19:41	36			18:42 (22)			17:03	16:45
9	07:47	07:23	07:41		06:48		18:21 (22)	06:03	05:41	05:49	06:17	06:50				18:04 (22)			07:00	07:34
	17:03	17:41	19:16		19:52	14	18:35 (22)	20:24	20:52	20:57	20:29	19:39	39			18:43 (22)			17:02	16:45
10	07:46	07:22	07:39		18:29 (22)		06:46		06:02	05:40	06:18	06:51				18:03 (22)			07:01	07:35
	17:04	17:42	19:17	14	18:43 (22)		19:53		20:25	20:53	20:28	19:37	41			18:44 (22)			17:01	16:45
11	07:46	07:20	07:38		18:25 (22)		06:44		06:01	05:40	06:19	06:52				18:01 (22)			07:03	07:36
	17:05	17:44	19:18	22	18:47 (22)		19:54		20:26	20:53	20:27	19:36	43			18:44 (22)			17:00	16:45
12	07:46	07:19	07:36		18:21 (22)		06:43		06:00	05:40	06:21	06:53				18:00 (22)			07:04	07:37
	17:06	17:45	19:20	28	18:49 (22)		19:55		20:27	20:54	20:25	19:34	44			18:44 (22)			16:59	16:45
13	07:45	07:18	07:34		18:20 (22)		06:41		05:59	05:40	06:22	06:54				17:59 (22)			07:05	07:38
	17:07	17:46	19:21	31	18:51 (22)		19:56		20:28	20:55	20:24	19:32	46			18:45 (22)			16:58	16:45
14	07:45	07:16	07:32		18:18 (22)		06:39		05:58	05:40	06:23	06:55				17:58 (22)			07:06	07:39
	17:08	17:48	19:22	35	18:53 (22)		19:57		20:29	20:55	20:24	19:30	47			18:45 (22)			16:57	16:45
15	07:45	07:15	07:31		18:16 (22)		06:38		05:57	05:40	06:24	06:57				17:57 (22)			07:08	07:39
	17:09	17:49	19:23	37	18:53 (22)		19:58		20:31	20:56	20:24	19:28	48			18:45 (22)			16:56	16:45
16	07:44	07:14	07:29		18:15 (22)		06:36		05:56	05:40	06:25	06:58				17:56 (22)			07:09	07:40
	17:10	17:50	19:24	40	18:55 (22)		20:00		20:32	20:56	20:20	19:27	49			18:45 (22)			16:55	16:46
17	07:44	07:12	07:27		18:13 (22)		06:35		05:55	05:40	06:26	06:59				17:56 (22)			07:10	07:41
	17:12	17:51	19:25	43	18:56 (22)		20:00		20:33	20:56	20:18	19:25	48			18:44 (22)			16:54	16:46
18	07:43	07:11	07:26		18:12 (22)		06:33		05:54	05:40	06:27	07:00				17:55 (22)			07:11	07:41
	17:13	17:53	19:27	44	18:56 (22)		20:01		20:34	20:57	20:17	19:23	49			18:44 (22)			16:53	16:46
19	07:43	07:09	07:24		18:11 (22)		06:31		05:53	05:40	06:28	07:01				17:55 (22)			07:12	07:42
	17:14	17:54	19:28	45	18:56 (22)		20:02		20:35	20:57	20:15	19:21	49			18:44 (22)			16:53	16:47
20	07:42	07:08	07:22		18:11 (22)		06:30		05:52	05:40	06:29	07:02				17:54 (22)			07:14	07:43
	17:15	17:55	19:29	46	18:57 (22)		20:03		20:36	20:57	20:14	19:20	49			18:43 (22)			16:52	16:47
21	07:41	07:07	07:20		18:10 (22)		06:28		05:51	05:40	06:30	07:03				17:54 (22)			07:15	07:43
	17:17	17:57	19:30	47	18:57 (22)		20:04		20:37	20:58	20:12	19:18	48			18:42 (22)			16:51	16:47
22	07:41	07:05	07:19		18:09 (22)		06:27		05:50	05:41	06:31	07:04				17:54 (22)			07:16	07:44
	17:18	17:58	19:31	48	18:57 (22)		20:05		20:38	20:58	20:11	19:16	48			18:42 (22)			16:50	16:48
23	07:40	07:04	07:17		18:08 (22)		06:25		05:49	05:41	06:00	06:32				17:54 (22)			07:17	07:44
	17:19	17:59	19:32	49	18:57 (22)		20:06		20:39	20:58	20:19	19:14	47			18:41 (22)			16:50	16:48
24	07:39	07:02	07:15		18:08 (22)		06:24		05:49	05:41	06:01	06:33				17:54 (22)			07:18	07:45
	17:20	18:00	19:34	49	18:57 (22)		20:07		20:40	20:58	20:13	19:13	46			18:40 (22)			16:49	16:49
25	07:38	07:00	07:13		18:08 (22)		06:22		05:48	05:41	06:02	06:34				17:54 (22)			07:20	07:45
	17:22	18:02	19:35	49	18:57 (22)		20:09		20:40	20:58	20:11	19:11	45			18:39 (22)			16:49	16:50
26	07:38	06:59	07:12		18:07 (22)		06:21		05:47	05:42	06:03	06:35				17:56 (22)			07:21	07:45
	17:23	18:03	19:36	49	18:56 (22)		20:10		20:41	20:58	20:10	19:09	42			18:38 (22)			16:48	16:50
27	07:37	06:57	07:10		18:07 (22)		06:19		05:46	05:42	06:04	06:36				17:56 (22)			07:22	07:46
	17:24	18:04	19:37	48	18:55 (22)		20:11		20:42	20:59	20:10	19:07	41			18:37 (22)			16:48	16:51
28	07:36	06:56	07:08		18:08 (22)		06:18		05:46	05:42	06:05	06:37				17:57 (22)			07:23	07:46
	17:25	18:05	19:38	47	18:55 (22)		20:12		20:43	20:59	20:10	19:05	38			18:35 (22)			16:47	16:52
29	07:35		07:06		18:08 (22)		06:16		05:45	05:43	06:06	06:39				17:58 (22)			07:24	07:46
	17:27		19:39	47	18:55 (22)		20:13		20:44	20:59	20:11	19:04	36			18:34 (22)			16:47	16:52
30	07:34		07:05		18:08 (22)		06:15		05:44	05:43	06:07	06:40				17:59 (22)			07:25	07:47
	17:28		19:40	45	18:53 (22)		20:14		20:45	20:59	20:11	19:56	33			18:32 (22)			16:46	16:53
31	07:33		07:03		18:08 (22)				05:44		06:08	06:41							07:47	
	17:29		19:41	44	18:52 (22)				20:46		20:40	19:54				18:13			16:54	
Potential sun hours	294	295	370		401				452		457	463	431		375		343		294	283
Total, worst case			907		285										1136		79			
Sun reduction			0.46		0.51										0.57		0.50			
Oper. time red.			1.00		1.00										1.00		1.00			
Wind dir. red.			0.63		0.63										0.63		0.63			
Total reduction			0.29		0.32										0.36		0.32			
Total, real			263		92										408		25			

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 116

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Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 366 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1403)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December	
1	07:47 16:55	07:32 17:31	06:54 18:07	07:01 19:43	06:14 20:15	05:43 20:47	06:18 (115) 20:59	05:44 20:59	06:24 (115) 20:39	06:09 19:53	06:42 19:00	07:14 17:12	06:50 16:46
2	07:47 16:56	07:31 17:32	06:53 18:08	07:00 19:44	06:12 20:16	05:43 20:47	06:18 (115) 20:58	05:44 20:58	06:25 (115) 20:38	06:10 19:51	06:43 18:59	07:15 17:10	06:51 16:46
3	07:47 16:57	07:30 17:33	06:51 18:09	06:58 19:45	06:11 20:18	05:43 20:48	06:18 (115) 20:58	05:45 20:58	06:25 (115) 20:37	06:11 19:49	06:44 18:57	07:16 17:09	06:53 16:45
4	07:47 16:58	07:29 17:35	06:49 18:10	06:49 19:46	06:10 20:19	05:42 20:49	06:18 (115) 20:58	05:45 20:58	06:25 (115) 20:36	06:12 19:48	06:45 18:55	07:17 17:08	06:54 16:45
5	07:47 16:59	07:28 17:36	06:48 18:11	06:54 19:47	06:08 20:20	05:42 20:50	06:18 (115) 20:58	05:46 20:58	06:25 (115) 20:34	06:13 19:46	06:46 18:53	07:18 17:07	06:55 16:45
6	07:47 17:00	07:27 17:37	06:46 18:13	06:53 19:48	06:07 20:21	05:41 20:50	06:19 (115) 20:58	05:47 20:58	06:25 (115) 20:33	06:14 19:44	06:47 18:52	07:19 17:06	06:56 16:45
7	07:47 17:01	07:25 17:39	06:44 18:14	06:51 19:49	06:06 20:22	05:41 20:51	06:19 (115) 20:57	05:47 20:57	06:25 (115) 20:32	06:15 19:43	06:48 18:50	07:20 17:04	06:58 16:45
8	07:47 17:02	07:24 17:40	06:43 19:15	06:49 19:51	06:05 20:23	05:41 20:52	06:19 (115) 20:57	05:48 20:57	06:25 (115) 20:31	06:16 19:41	06:49 18:48	07:22 17:03	06:59 16:45
9	07:47 17:03	07:23 17:41	06:41 19:16	06:48 19:52	06:03 20:24	05:41 20:52	06:19 (115) 20:57	05:49 20:57	06:26 (115) 20:29	06:17 19:39	06:50 18:47	07:23 17:02	07:00 16:45
10	07:46 17:04	07:22 17:42	06:39 19:17	06:46 19:53	06:02 20:25	05:40 20:53	06:20 (115) 20:56	05:49 20:56	06:25 (115) 20:28	06:18 19:37	06:51 18:45	07:24 17:01	07:35 16:45
11	07:46 17:05	07:21 17:44	06:38 19:19	06:44 19:54	06:01 20:26	05:40 20:54	06:20 (115) 20:56	05:50 20:56	06:25 (115) 20:27	06:20 19:36	06:52 18:43	07:25 17:03	07:36 16:45
12	07:46 17:06	07:19 17:45	06:36 19:20	06:43 19:55	06:00 20:27	05:40 20:54	06:21 (115) 20:55	05:51 20:55	06:26 (115) 20:25	06:21 19:34	06:53 18:42	07:26 16:59	07:37 16:45
13	07:46 17:07	07:18 17:46	06:34 19:21	06:41 19:56	05:59 20:29	05:40 20:55	06:21 (115) 20:55	05:52 20:55	06:26 (115) 20:24	06:22 19:32	06:54 18:40	07:27 17:05	07:38 16:45
14	07:45 17:08	07:17 17:48	06:33 19:22	06:39 19:57	05:58 20:30	05:40 20:55	06:21 (115) 20:54	05:52 20:54	06:26 (115) 20:23	06:23 19:30	06:56 18:38	07:28 17:07	07:39 16:45
15	07:45 17:09	07:15 17:49	06:31 19:23	06:38 19:58	05:57 20:31	05:40 20:56	06:22 (115) 20:54	05:53 20:54	06:26 (115) 20:21	06:24 19:29	06:57 18:37	07:30 17:06	07:39 16:45
16	07:44 17:11	07:14 17:50	06:29 19:24	06:36 20:00	05:56 20:32	05:40 20:56	06:22 (115) 20:53	05:54 20:53	06:27 (115) 20:20	06:25 19:27	06:58 18:35	07:31 17:05	07:40 16:46
17	07:44 17:12	07:12 17:52	06:27 19:26	06:35 20:00	05:55 20:33	05:40 20:56	06:22 (115) 20:53	05:55 20:53	06:27 (115) 20:18	06:26 19:25	06:59 18:34	07:32 17:04	07:41 16:46
18	07:43 17:13	07:11 17:53	06:26 19:27	06:33 20:01	05:54 20:34	05:40 20:57	06:22 (115) 20:52	05:56 20:52	06:28 (115) 20:17	06:27 19:23	07:00 18:32	07:33 17:03	07:41 16:46
19	07:43 17:14	07:10 17:54	06:24 19:28	06:31 20:02	05:53 20:35	05:40 20:57	06:22 (115) 20:51	05:57 20:51	06:29 (115) 20:15	06:28 19:21	07:01 18:30	07:34 17:13	07:42 16:47
20	07:42 17:15	07:08 17:55	06:22 19:29	06:30 20:03	05:52 20:36	05:40 20:57	06:22 (115) 20:50	05:58 20:50	06:29 (115) 20:14	06:29 19:20	07:02 18:29	07:35 17:14	07:43 16:47
21	07:41 17:17	07:07 17:57	06:20 19:30	06:28 20:04	05:51 20:37	05:40 20:58	06:22 (115) 20:50	05:58 20:50	06:30 (115) 20:12	06:30 19:18	07:03 18:27	07:37 17:15	07:43 16:47
22	07:41 17:18	07:05 17:58	06:19 19:31	06:27 20:05	05:50 20:38	05:40 20:58	06:23 (115) 20:49	05:59 20:49	06:30 (115) 20:11	06:31 19:16	07:04 18:26	07:38 17:16	07:44 16:48
23	07:40 17:19	07:04 17:59	06:17 19:32	06:25 20:06	05:49 20:39	05:40 20:58	06:23 (115) 20:48	06:00 20:48	06:31 (115) 20:09	06:32 19:14	07:05 18:24	07:39 17:17	07:44 16:48
24	07:39 17:20	07:02 18:00	06:15 19:34	06:24 20:07	05:49 20:40	05:41 20:58	06:23 (115) 20:47	06:01 20:47	06:32 (115) 20:08	06:33 19:13	07:06 18:23	07:40 17:19	07:45 16:49
25	07:38 17:22	07:01 18:02	06:13 19:35	06:22 20:09	05:48 20:41	05:41 20:58	06:24 (115) 20:46	06:02 20:46	06:33 (115) 20:06	06:34 19:11	07:07 18:21	07:41 17:20	07:45 16:50
26	07:38 17:23	06:59 18:03	06:12 19:36	06:21 20:10	05:47 20:41	05:42 20:59	06:24 (115) 20:45	06:03 20:45	06:34 (115) 20:04	06:35 19:09	07:08 18:20	07:43 17:21	07:46 16:50
27	07:37 17:24	06:57 18:04	06:10 19:37	06:19 20:11	05:46 20:42	05:42 20:59	06:24 (115) 20:44	06:04 20:44	06:37 (115) 20:04	06:37 19:07	07:09 18:19	07:44 17:22	07:46 16:51
28	07:36 17:25	06:56 18:05	06:08 19:38	06:18 20:12	05:46 20:43	05:45 20:59	06:24 (115) 20:43	06:05 20:43	06:45 (115) 20:03	06:38 19:07	07:11 18:17	07:45 17:23	07:46 16:52
29	07:35 17:27	06:55 18:06	06:07 19:39	06:16 20:13	05:45 20:44	05:43 20:59	06:24 (115) 20:42	06:06 20:42	06:45 (115) 20:00	06:39 19:04	07:12 18:16	07:46 17:24	07:46 16:52
30	07:34 17:28	06:54 18:07	06:06 19:40	06:15 20:14	05:44 20:45	05:43 20:59	06:25 (115) 20:41	06:07 20:41	06:40 19:56	07:13 19:02	07:48 18:14	07:25 17:25	07:47 16:53
31	07:33 17:29	06:53 18:08	06:05 19:42	06:14 20:15	05:43 20:46	05:42 20:59	06:25 (115) 20:40	06:08 20:40	06:41 19:55	07:49 18:13	07:49 17:26	07:47 16:54	
Potential sun hours	294	295	370	401	452	457	463	431	375	343	294	283	
Total, worst case					331	773	643						
Sun reduction					0.56	0.65	0.67						
Oper. time red.					1.00	1.00	1.00						
Wind dir. red.					0.68	0.68	0.68						
Total reduction					0.38	0.44	0.45						
Total, real					126	341	292						

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 117

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 382 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1406)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December										
1	07:47	07:32	06:54	07:01	06:14	05:43	06:32 (22)	05:44	06:40 (22)	06:09	06:44 (22)	06:42	07:14	06:50	07:26							
	16:55	17:31	18:07	19:43	20:15	20:47	36	07:08 (22)	20:59	31	07:11 (22)	20:39	31	07:15 (22)	19:53	19:00	17:12	16:46				
2	07:47	07:31	06:53	07:00	06:12	05:43	06:32 (22)	05:44	06:41 (22)	06:10	06:45 (22)	06:43	07:15	06:51	07:28							
	16:56	17:32	18:08	19:44	20:16	20:47	35	07:07 (22)	20:58	31	07:12 (22)	20:38	29	07:14 (22)	19:51	18:59	17:10	16:46				
3	07:47	07:30	06:51	06:58	06:11	05:43	06:33 (22)	05:45	06:40 (22)	06:11	06:46 (22)	06:44	07:16	06:53	07:29							
	16:57	17:33	18:09	19:45	20:18	20:48	35	07:08 (22)	20:58	32	07:12 (22)	20:37	27	07:13 (22)	19:49	18:57	17:09	16:45				
4	07:47	07:29	06:49	06:56	06:10	05:42	06:32 (22)	05:46	06:40 (22)	06:12	06:47 (22)	06:45	07:17	06:54	07:30							
	16:58	17:35	18:10	19:46	20:19	20:49	35	07:07 (22)	20:58	33	07:13 (22)	20:36	25	07:12 (22)	19:48	18:55	17:08	16:45				
5	07:47	07:28	06:48	06:54	06:08	05:42	06:33 (22)	05:46	06:40 (22)	06:13	06:48 (22)	06:46	07:18	06:55	07:31							
	16:59	17:36	18:11	19:47	20:20	7	06:46 (22)	05:42	06:53 (22)	20:50	34	07:07 (22)	20:58	33	07:13 (22)	20:34	21	07:09 (22)	19:46	18:53	17:07	16:45
6	07:47	07:27	06:46	06:53	06:07	05:41	06:34 (22)	05:47	06:40 (22)	06:14	06:49 (22)	06:47	07:19	06:56	07:32							
	17:00	17:37	18:13	19:48	20:21	15	06:56 (22)	20:50	33	07:07 (22)	20:58	34	07:14 (22)	20:33	18	07:07 (22)	19:44	18:52	17:06	16:45		
7	07:47	07:25	06:44	06:51	06:06	05:41	06:39 (22)	05:41	06:35 (22)	05:47	06:39 (22)	06:15	06:52 (22)	06:48	07:20	06:58	07:33					
	17:01	17:39	18:14	19:49	20:22	19	06:58 (22)	20:51	33	07:08 (22)	20:57	34	07:13 (22)	20:32	13	07:05 (22)	19:43	18:50	17:04	16:45		
8	07:47	07:24	07:43	06:49	06:05	05:41	06:34 (22)	05:48	06:40 (22)	06:16	06:49	07:22	06:59	07:34								
	17:02	17:40	19:15	19:51	20:23	23	07:00 (22)	20:52	33	07:07 (22)	20:57	34	07:14 (22)	20:31	19:41	18:48	17:03	16:45				
9	07:47	07:23	07:41	06:48	06:03	05:41	06:36 (22)	05:41	06:35 (22)	05:49	06:40 (22)	06:17	06:50	07:23	07:00	07:34						
	17:03	17:41	19:16	19:52	20:24	26	07:02 (22)	20:52	32	07:07 (22)	20:57	35	07:15 (22)	20:29	19:39	18:47	17:02	16:45				
10	07:46	07:22	07:39	06:46	06:02	05:40	06:35 (22)	05:40	06:35 (22)	05:49	06:39 (22)	06:18	06:51	07:24	07:01	07:35						
	17:04	17:42	19:17	19:53	20:25	28	07:03 (22)	20:53	32	07:07 (22)	20:56	35	07:14 (22)	20:28	19:37	18:45	17:01	16:45				
11	07:46	07:20	07:38	06:44	06:01	05:40	06:34 (22)	05:40	06:36 (22)	05:50	06:40 (22)	06:20	06:52	07:25	07:03	07:36						
	17:05	17:44	19:19	19:54	20:26	30	07:04 (22)	20:54	31	07:07 (22)	20:56	35	07:15 (22)	20:27	19:36	18:43	17:00	16:45				
12	07:46	07:19	07:36	06:43	06:00	05:40	06:33 (22)	05:40	06:36 (22)	05:51	06:40 (22)	06:21	06:53	07:26	07:04	07:37						
	17:06	17:45	19:20	19:55	20:27	32	07:05 (22)	20:54	31	07:07 (22)	20:55	36	07:16 (22)	20:25	19:34	18:42	16:59	16:45				
13	07:45	07:18	07:34	06:41	05:59	05:40	06:33 (22)	05:40	06:37 (22)	05:52	06:40 (22)	06:22	06:54	07:27	07:05	07:38						
	17:07	17:46	19:21	19:56	20:28	32	07:05 (22)	20:55	30	07:07 (22)	20:55	36	07:16 (22)	20:24	19:32	18:40	16:58	16:45				
14	07:45	07:17	07:33	06:39	05:58	05:40	06:32 (22)	05:40	06:37 (22)	05:52	06:39 (22)	06:23	06:56	07:28	07:06	07:39						
	17:08	17:48	19:22	19:57	20:30	34	07:06 (22)	20:55	30	07:07 (22)	20:54	37	07:16 (22)	20:23	19:30	18:38	16:57	16:45				
15	07:45	07:15	07:31	06:38	05:57	05:40	06:32 (22)	05:40	06:38 (22)	05:53	06:39 (22)	06:24	06:57	07:30	07:08	07:39						
	17:09	17:49	19:23	19:58	20:31	34	07:06 (22)	20:56	29	07:07 (22)	20:54	37	07:16 (22)	20:21	19:29	18:37	16:56	16:45				
16	07:44	07:14	07:29	06:36	05:56	05:40	06:31 (22)	05:40	06:38 (22)	05:54	06:40 (22)	06:25	06:58	07:31	07:09	07:40						
	17:11	17:50	19:24	20:00	20:32	36	07:07 (22)	20:56	29	07:07 (22)	20:53	37	07:17 (22)	20:20	19:27	18:35	16:55	16:46				
17	07:44	07:12	07:27	06:35	05:55	05:40	06:31 (22)	05:40	06:38 (22)	05:55	06:40 (22)	06:26	06:59	07:32	07:10	07:41						
	17:12	17:52	19:26	20:00	20:33	36	07:07 (22)	20:56	29	07:07 (22)	20:52	37	07:17 (22)	20:18	19:25	18:34	16:54	16:46				
18	07:43	07:11	07:26	06:33	05:54	05:40	06:30 (22)	05:40	06:38 (22)	05:56	06:40 (22)	06:27	07:00	07:33	07:11	07:41						
	17:13	17:53	19:27	20:01	20:34	37	07:07 (22)	20:57	29	07:07 (22)	20:52	38	07:18 (22)	20:17	19:23	18:32	16:54	16:46				
19	07:43	07:10	07:24	06:31	05:53	05:40	06:30 (22)	05:40	06:38 (22)	05:57	06:40 (22)	06:28	07:01	07:34	07:12	07:42						
	17:14	17:54	19:28	20:02	20:35	37	07:07 (22)	20:57	30	07:08 (22)	20:51	38	07:18 (22)	20:15	19:21	18:30	16:53	16:47				
20	07:42	07:08	07:22	06:30	05:52	05:40	06:30 (22)	05:40	06:39 (22)	05:58	06:39 (22)	06:29	07:02	07:35	07:14	07:43						
	17:15	17:55	19:29	20:03	20:36	37	07:07 (22)	20:57	29	07:08 (22)	20:50	38	07:17 (22)	20:14	19:20	18:29	16:52	16:47				
21	07:41	07:07	07:20	06:28	05:51	05:40	06:29 (22)	05:40	06:39 (22)	05:58	06:40 (22)	06:30	07:03	07:37	07:15	07:43						
	17:17	17:57	19:30	20:04	20:37	38	07:07 (22)	20:58	29	07:08 (22)	20:50	37	07:17 (22)	20:12	19:18	18:27	16:51	16:47				
22	07:41	07:05	07:19	06:27	05:50	05:41	06:30 (22)	05:41	06:40 (22)	05:59	06:40 (22)	06:31	07:04	07:38	07:16	07:44						
	17:18	17:58	19:31	20:05	20:38	38	07:08 (22)	20:58	29	07:09 (22)	20:49	38	07:18 (22)	20:11	19:16	18:26	16:51	16:48				
23	07:40	07:04	07:17	06:25	05:49	05:41	06:30 (22)	05:41	06:39 (22)	06:00	06:40 (22)	06:32	07:05	07:39	07:17	07:44						
	17:19	17:59	19:32	20:06	20:39	38	07:08 (22)	20:58	30	07:09 (22)	20:48	38	07:18 (22)	20:09	19:14	18:24	16:50	16:49				
24	07:39	07:02	07:15	06:24	05:49	05:41	06:30 (22)	05:41	06:39 (22)	06:01	06:40 (22)	06:33	07:06	07:40	07:19	07:45						
	17:20	18:00	19:34	20:07	20:40	38	07:08 (22)	20:58	30	07:09 (22)	20:47	38	07:18 (22)	20:08	19:13	18:23	16:49	16:49				
25	07:38	07:00	07:13	06:22	05:48	05:41	06:40 (22)	06:02	06:41 (22)	06:34	06:41 (22)	06:34	07:07	07:41	07:20	07:45						
	17:22	18:02	19:35	20:09	20:41	37	07:08 (22)	20:58	29	07:09 (22)	20:46	37	07:18 (22)	20:06	19:11	18:21	16:49	16:50				
26	07:38	06:59	07:12	06:21	05:47	05:42	06:30 (22)	05:42	06:40 (22)	06:03	06:41 (22)	06:35	07:08	07:43	07:21	07:45						
	17:23	18:03	19:36	20:10	20:41	38	07:08 (22)	20:59	29	07:09 (22)	20:45	37	07:18 (22)	20:04	19:09	18:20	16:48	16:50				
27	07:37	06:57	07:10	06:19	05:46	05:42	06:30 (22)	05:42	06:40 (22)	06:04	06:41 (22)	06:36	07:09	07:44	07:22	07:46						
	17:24	18:04	19:37	20:11	20:42	38	07:08 (22)	20:59	29	07:09 (22)	20:44	36	07:17 (22)	20:03	19:07	18:18	16:48	16:51				
28	07:36	06:56	07:08	06:18	05:46	05:43	06:31 (22)	05:43	06:40 (22)	06:05	06:42 (22)	06:38	07:10	07:45	07:23	07:46						
	17:25	18:05	19:38	20:12	20:43	37	07:08 (22)	20:59	30	07:10 (22)	20:43	35	07:17 (22)	20:01	19:06	18:17	16:47	16:52				
29	07:35		07:07	06:16	05:45	05:43	06:31 (22)	05:43	06:40 (22)	06:06	06:42 (22)	06:39	07:12	07:46	07:24	07:46						
	17:27		19:39	20:13	20:44	37	07:08 (22)	20:59	30	07:10 (22)	20:42	35	07:17 (22)	19:58	19:04	18:16	16:47	16:52				
30	07:34		07:05	06:15	05:45	05:43	06:32 (22)	05:43	06:41 (22)	06:07	06:43 (22)	06:40	07:13	07:48	07:25	07:47						
	17:28		19:40	20:14	20:45	36	07:08 (22)	20:59	30	07:11 (22)	20:41	33	07:16 (22)	19:56	19:02	18:14	16:46	16:53				
31	07:33		07:03	06:14	05:44	05:41	06:31 (22)		06:08	06:44 (22)	06:41		07:49	07:27	07:47							
	17:29		19:42	20:16	20:46	37	07:08 (22)		20:40	07:16 (22)	19:55		18:13	16:46	16:54							
Potential sun hours	294	295	370	401	452		457		463		431		375	343	294	283						
Total, worst case					875		930		1097		164											
Sun reduction					0.56		0.65		0.67		0.64											
Oper. time red.					1.00		1.00		1.00		1.00											
Wind dir. red.																						

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 118

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 384 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1408)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

January		February		March		April		May		June	
1	07:47		08:13 (36) 07:32		16:06 (111) 06:54		07:57 (103) 07:01		06:14		05:43
	16:55	11	08:24 (36) 17:31		16:37 (111) 18:06	37	17:44 (49) 19:43		20:15		20:47
2	07:47		08:12 (36) 07:31		16:07 (111) 06:53		17:19 (49) 07:00		06:12		05:43
	16:56	13	08:25 (36) 17:32		16:36 (111) 18:08	25	17:44 (49) 19:44		20:16		20:47
3	07:47		08:12 (36) 07:30		16:08 (111) 06:51		17:20 (49) 06:58		06:11		05:42
	16:57	14	08:26 (36) 17:33		16:36 (111) 18:09	25	17:45 (49) 19:45		20:18		20:48
4	07:47		08:12 (36) 07:29		08:01 (103) 06:49		17:20 (49) 06:56		06:10		05:42
	16:58	15	08:27 (36) 17:35		16:35 (111) 18:10	24	17:44 (49) 19:46		20:19		20:49
5	07:47		08:12 (36) 07:28		07:57 (103) 06:48		17:20 (49) 06:54		06:08		05:42
	16:59	17	08:29 (36) 17:36		16:34 (111) 18:11	23	17:43 (49) 19:47		20:20		20:50
6	07:47		08:12 (36) 07:27		07:55 (103) 06:46		17:21 (49) 06:53		06:07		05:41
	17:00	18	08:30 (36) 17:37		16:33 (111) 18:13	21	17:42 (49) 19:48		20:21		20:50
7	07:47		08:12 (36) 07:25		07:53 (103) 06:44		17:22 (49) 06:51		06:06		05:41
	17:00	19	08:31 (36) 17:38		16:32 (111) 18:14	19	17:41 (49) 19:49		20:22		20:51
8	07:47		08:11 (36) 07:24		07:52 (103) 07:43		18:23 (49) 06:49		06:05		05:41
	17:02	26	16:16 (111) 17:40		16:30 (111) 19:15	16	18:39 (49) 19:51		20:23		20:52
9	07:47		08:12 (36) 07:23		07:50 (103) 07:41		18:26 (49) 06:48		06:03		05:40
	17:03	30	16:19 (111) 17:41		16:26 (111) 19:16	11	18:37 (49) 19:52		20:24		20:52
10	07:46		08:12 (36) 07:22		07:50 (103) 07:39		06:46		06:02		05:40
	17:04	34	16:21 (111) 17:42		08:20 (103) 19:17		19:53		20:25		20:53
11	07:46		08:12 (36) 07:20		07:49 (103) 07:38		06:44		06:01		05:40
	17:05	38	16:23 (111) 17:44		08:21 (103) 19:18		19:54		20:26		20:54
12	07:46		08:12 (36) 07:19		07:49 (103) 07:36		06:43		06:00		05:40
	17:06	40	16:24 (111) 17:45		08:22 (103) 19:20		19:55		20:27		20:54
13	07:46		08:12 (36) 07:18		07:48 (103) 07:34		06:41		05:59		05:40
	17:07	44	16:26 (111) 17:46		08:22 (103) 19:21		19:56		20:29		20:55
14	07:45		08:12 (36) 07:17		07:47 (103) 07:33		06:39		05:58		05:40
	17:08	46	16:27 (111) 17:48		08:23 (103) 19:22		19:57		20:30		20:55
15	07:45		08:12 (36) 07:15		07:47 (103) 07:31		06:38		05:57		05:40
	17:09	49	16:29 (111) 17:49		08:23 (103) 19:23		19:58		20:31		20:56
16	07:44		08:12 (36) 07:14		07:47 (103) 07:29		06:36		05:56		05:40
	17:10	50	16:29 (111) 17:50		08:23 (103) 19:24		20:00		20:32		20:56
17	07:44		08:13 (36) 07:12		07:47 (103) 07:27		06:34		05:55		05:40
	17:12	52	16:31 (111) 17:51		08:24 (103) 19:26		20:00		20:33		20:56
18	07:43		08:13 (36) 07:11		07:46 (103) 07:26		06:33		05:54		05:40
	17:13	52	16:31 (111) 17:53		08:23 (103) 19:27		20:01		20:34		20:57
19	07:43		08:13 (36) 07:10		07:47 (103) 07:24		06:31		05:53		05:40
	17:14	54	16:32 (111) 17:54		08:23 (103) 19:28		20:02		20:35		20:57
20	07:42		08:14 (36) 07:08		07:47 (103) 07:22		06:30		05:52		05:40
	17:15	54	16:33 (111) 17:55		08:23 (103) 19:29		20:03		20:36		20:57
21	07:41		08:14 (36) 07:07		07:47 (103) 07:20		06:28		05:51		05:40
	17:16	56	16:34 (111) 17:57		08:23 (103) 19:30		20:04		20:37		20:58
22	07:41		08:14 (36) 07:05		07:47 (103) 07:19		06:27		05:50		05:40
	17:18	55	16:34 (111) 17:58		17:35 (49) 19:31		20:05		20:38		20:58
23	07:40		08:15 (36) 07:04		07:48 (103) 07:17		06:25		05:49		05:41
	17:19	54	16:34 (111) 17:59		17:37 (49) 19:32		20:06		20:39		20:58
24	07:39		08:16 (36) 07:02		07:49 (103) 07:15		06:24		05:48		05:41
	17:20	55	16:36 (111) 18:00		17:38 (49) 19:34		20:07		20:40		20:58
25	07:38		08:17 (36) 07:00		07:49 (103) 07:13		06:22		05:48		05:41
	17:22	53	16:36 (111) 18:02		17:39 (49) 19:35		20:09		20:41		20:58
26	07:38		08:17 (36) 06:59		07:51 (103) 07:12		06:21		05:47		05:42
	17:23	53	16:36 (111) 18:03		17:41 (49) 19:36		20:10		20:41		20:59
27	07:37		08:18 (36) 06:57		07:52 (103) 07:10		06:19		05:46		05:42
	17:24	52	16:37 (111) 18:04		17:41 (49) 19:37		20:11		20:42		20:59
28	07:36		08:20 (36) 06:56		07:54 (103) 07:08		06:18		05:46		05:42
	17:25	49	16:37 (111) 18:05		17:43 (49) 19:38		20:12		20:43		20:59
29	07:35		08:21 (36)		07:06		06:16		05:45		05:43
	17:27	47	16:37 (111)		19:39		20:13		20:44		20:59
30	07:34		08:24 (36)		07:05		06:15		05:44		05:43
	17:28	41	16:37 (111)		19:40		20:14		20:45		20:59
31	07:33		16:05 (111)		07:03				05:44		
	17:29	32	16:37 (111)		19:41				20:46		
Potential sun hours	294		295		370		401		452		457
Total, worst case	1223		1047		201						
Sun reduction	0.31		0.38		0.46						
Oper. time red.	1.00		1.00		1.00						
Wind dir. red.	0.63		0.61		0.65						
Total reduction	0.20		0.23		0.30						
Total, real	241		245		60						

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 119

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 384 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1408)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	05:44	06:09	06:42	07:14	06:50	07:19 (103) 07:27
2	05:44	06:10	06:43	07:15	06:51	07:20 (103) 07:28
3	05:45	06:11	06:44	07:16	06:52	07:21 (103) 07:29
4	05:45	06:12	06:45	07:17	06:53	07:22 (103) 07:30
5	05:46	06:13	06:46	07:18	06:54	07:23 (103) 07:31
6	05:47	06:14	06:47	07:19	06:55	07:24 (103) 07:32
7	05:47	06:15	06:48	07:20	06:56	07:25 (103) 07:33
8	05:48	06:16	06:49	07:21	06:57	07:26 (103) 07:34
9	05:49	06:17	06:50	07:22	06:58	07:27 (103) 07:35
10	05:49	06:18	06:51	07:23	06:59	07:28 (103) 07:36
11	05:50	06:19	06:52	07:24	07:00	07:29 (103) 07:37
12	05:51	06:20	06:53	07:25	07:01	07:30 (103) 07:38
13	05:52	06:21	06:54	07:26	07:02	07:31 (103) 07:39
14	05:52	06:22	06:55	07:27	07:03	07:32 (103) 07:40
15	05:53	06:23	06:56	07:28	07:04	07:33 (103) 07:41
16	05:54	06:24	06:57	07:29	07:05	07:34 (103) 07:42
17	05:55	06:25	06:58	07:30	07:06	07:35 (103) 07:43
18	05:56	06:26	06:59	07:31	07:07	07:36 (103) 07:44
19	05:57	06:27	07:00	07:32	07:08	07:37 (103) 07:45
20	05:58	06:28	07:01	07:33	07:09	07:38 (103) 07:46
21	05:58	06:29	07:02	07:34	07:10	07:39 (103) 07:47
22	05:59	06:30	07:03	07:35	07:11	07:40 (103) 07:48
23	06:00	06:31	07:04	07:36	07:12	07:41 (103) 07:49
24	06:01	06:32	07:05	07:37	07:13	07:42 (103) 07:50
25	06:02	06:33	07:06	07:38	07:14	07:43 (103) 07:51
26	06:03	06:34	07:07	07:39	07:15	07:44 (103) 07:52
27	06:04	06:35	07:08	07:40	07:16	07:45 (103) 07:53
28	06:05	06:36	07:09	07:41	07:17	07:46 (103) 07:54
29	06:06	06:37	07:10	07:42	07:18	07:47 (103) 07:55
30	06:07	06:38	07:11	07:43	07:19	07:48 (103) 07:56
31	06:08	06:39	07:12	07:44	07:20	07:49 (103) 07:57
Potential sun hours	464	431	375	343	294	283
Total, worst case				918	1341	302
Sun reduction				0.50	0.29	0.27
Oper. time red.				1.00	1.00	1.00
Wind dir. red.				0.61	0.64	0.59
Total reduction				0.30	0.19	0.16
Total, real				280	251	48

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 120

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 387 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1410)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	January			February			March			April			May			June		
1	07:47		09:08 (30)	07:32			06:54			07:01		07:21 (33)	06:14		06:34 (100)	05:43		
	16:55	69	10:17 (30)	17:31			18:06			19:43	41	08:02 (33)	20:15	47	07:51 (33)	20:47		
2	07:47		09:08 (30)	07:31			06:53			07:00		07:19 (33)	06:12		06:32 (100)	05:43		
	16:56	69	10:17 (30)	17:32			18:08			19:44	44	08:03 (33)	20:16	46	07:49 (33)	20:47		
3	07:47		09:09 (30)	07:30			06:51			06:58		07:17 (33)	06:11		06:31 (100)	05:42		
	16:57	68	10:17 (30)	17:33			18:09			19:45	46	08:03 (33)	20:18	45	07:48 (33)	20:48		
4	07:47		09:09 (30)	07:29			06:49			06:56		07:15 (33)	06:10		06:30 (100)	05:42		
	16:58	69	10:18 (30)	17:35			18:10			19:46	49	08:04 (33)	20:19	43	07:46 (33)	20:49		
5	07:47		09:10 (30)	07:28			06:48			06:54		07:14 (33)	06:08		06:29 (100)	05:42		
	16:59	68	10:18 (30)	17:36			18:11			19:47	51	08:05 (33)	20:20	40	07:44 (33)	20:50		
6	07:47		09:11 (30)	07:27			06:46			06:53		07:12 (33)	06:07		06:27 (100)	05:41		
	17:00	67	10:18 (30)	17:37			18:13			19:48	53	08:05 (33)	20:21	37	07:41 (33)	20:50		
7	07:47		09:12 (30)	07:25			06:44			06:51		07:10 (33)	06:06		06:26 (100)	05:41		
	17:01	67	10:19 (30)	17:38			18:14			19:49	55	08:05 (33)	20:22	32	07:38 (33)	20:51		
8	07:47		09:12 (30)	07:24			07:43			06:49		07:09 (33)	06:05		06:25 (100)	05:41		
	17:02	66	10:18 (30)	17:40			19:15			19:50	57	08:06 (33)	20:23	26	07:35 (33)	20:52		
9	07:47		09:13 (30)	07:23			07:41			06:48		07:07 (33)	06:03		06:24 (100)	05:40		
	17:03	65	10:18 (30)	17:41			19:16			19:52	59	08:06 (33)	20:24	14	06:38 (100)	20:52		
10	07:46		09:14 (30)	07:22			07:39		07:59 (29)	06:46		07:05 (33)	06:02		06:23 (100)	05:40		
	17:04	65	10:19 (30)	17:42			19:17	1	08:00 (29)	19:53	65	19:30 (115)	20:25	15	06:38 (100)	20:53		
11	07:46		09:14 (30)	07:20			07:38		07:57 (29)	06:44		07:04 (33)	06:01		06:22 (100)	05:40		
	17:05	64	10:18 (30)	17:44			19:18	4	08:01 (29)	19:54	71	19:32 (115)	20:26	15	06:37 (100)	20:54		
12	07:46		09:15 (30)	07:19			07:36		07:55 (29)	06:43		07:03 (33)	06:00		06:21 (100)	05:40		
	17:06	63	10:18 (30)	17:45			19:20	7	08:02 (29)	19:55	75	19:33 (115)	20:27	16	06:37 (100)	20:54		
13	07:45		09:16 (30)	07:18			07:34		07:54 (29)	06:41		07:02 (33)	05:59		06:20 (100)	05:40		
	17:07	63	10:19 (30)	17:46			19:21	9	08:03 (29)	19:56	78	19:33 (115)	20:28	16	06:36 (100)	20:55		
14	07:45		09:16 (30)	07:16			07:32		07:52 (29)	06:39		07:02 (33)	05:58		06:19 (100)	05:40		
	17:08	62	10:18 (30)	17:48			19:22	11	08:03 (29)	19:57	81	19:35 (115)	20:30	16	06:35 (100)	20:55		
15	07:45		09:17 (30)	07:15			07:31		07:50 (29)	06:38		07:02 (33)	05:57		06:18 (100)	05:40		
	17:09	61	10:18 (30)	17:49			19:23	13	08:03 (29)	19:58	82	19:36 (115)	20:31	17	06:35 (100)	20:56		
16	07:44		09:18 (30)	07:14	07:34 (28)	07:29	07:29		07:49 (29)	06:36		07:02 (33)	05:56		06:17 (100)	05:40		
	17:10	60	10:18 (30)	17:50	1	07:35 (28)	19:24	15	08:04 (29)	20:00	85	19:37 (115)	20:32	17	06:34 (100)	20:56		
17	07:44		09:19 (30)	07:12	07:32 (28)	07:27	07:27		07:47 (29)	06:34		07:01 (33)	05:55		06:16 (100)	05:40		
	17:12	59	10:18 (30)	17:51	3	07:35 (28)	19:25	17	08:04 (29)	20:00	87	19:38 (115)	20:33	16	06:32 (100)	20:56		
18	07:43		09:20 (30)	07:11	07:31 (28)	07:26	07:26		07:45 (29)	06:33		07:01 (33)	05:54		06:17 (100)	05:40		
	17:13	57	10:17 (30)	17:53	5	07:36 (28)	19:27	18	08:03 (29)	20:01	87	19:38 (115)	20:34	14	06:31 (100)	20:57		
19	07:43		09:21 (30)	07:09	07:30 (28)	07:24	07:24		07:43 (29)	06:31		07:02 (33)	05:53		06:19 (100)	05:40		
	17:14	55	10:16 (30)	17:54	7	07:37 (28)	19:28	19	08:02 (29)	20:02	88	19:40 (115)	20:35	10	06:29 (100)	20:57		
20	07:42		09:22 (30)	07:08	07:28 (28)	07:22	07:22		07:42 (29)	06:30		07:01 (33)	05:52		05:40			
	17:15	54	10:16 (30)	17:55	8	07:36 (28)	19:29	21	08:03 (29)	20:03	89	19:41 (115)	20:36		20:57			
21	07:41		09:23 (30)	07:07	07:27 (28)	07:20	07:20		07:40 (29)	06:28		07:02 (33)	05:51		05:40			
	17:16	52	10:15 (30)	17:57	10	07:37 (28)	19:30	22	08:02 (29)	20:04	88	19:42 (115)	20:37		20:58			
22	07:41		09:24 (30)	07:05	07:25 (28)	07:19	07:19		07:38 (29)	06:27		07:02 (33)	05:50		05:40			
	17:18	50	10:14 (30)	17:58	11	07:36 (28)	19:31	22	08:00 (29)	20:05	86	19:41 (115)	20:38		20:58			
23	07:40		09:25 (30)	07:04	07:23 (28)	07:17	07:17		07:36 (29)	06:25		07:02 (33)	05:49		05:41			
	17:19	48	10:13 (30)	17:59	12	07:35 (28)	19:32	23	07:59 (29)	20:06	85	19:41 (115)	20:39		20:58			
24	07:39		09:27 (30)	07:02	07:22 (28)	07:15	07:15		07:34 (29)	06:24		07:02 (33)	05:48		05:41			
	17:20	46	10:13 (30)	18:00	13	07:35 (28)	19:34	23	07:57 (29)	20:07	83	19:40 (115)	20:40		20:58			
25	07:38		09:29 (30)	07:00	07:20 (28)	07:13	07:13		07:35 (33)	06:22		07:03 (33)	05:48		05:41			
	17:22	42	10:11 (30)	18:02	13	07:33 (28)	19:35	21	07:56 (29)	20:09	80	19:39 (115)	20:40		20:58			
26	07:38		09:30 (30)	06:59	07:19 (28)	07:12	07:12		07:31 (33)	06:21		07:04 (33)	05:47		05:42			
	17:23	40	10:10 (30)	18:03	13	07:32 (28)	19:36	22	07:53 (29)	20:10	75	19:38 (115)	20:41		20:58			
27	07:37		09:32 (30)	06:57	07:17 (28)	07:10	07:10		07:29 (33)	06:19		07:04 (33)	05:46		05:42			
	17:24	36	10:08 (30)	18:04	13	07:30 (28)	19:37	25	07:54 (33)	20:11	72	19:36 (115)	20:42		20:59			
28	07:36		09:34 (30)	06:56	07:22 (28)	07:08	07:08		07:27 (33)	06:18		07:05 (33)	05:46		05:42			
	17:25	32	10:06 (30)	18:05	4	07:26 (28)	19:38	29	07:56 (33)	20:12	67	19:35 (115)	20:43		20:59			
29	07:35		09:37 (30)		07:37 (30)		07:06		07:26 (33)	06:16		07:05 (33)	05:45		05:43			
	17:27	27	10:04 (30)		09:40 (30)		19:39	32	07:58 (33)	20:13	61	19:32 (115)	20:44		20:59			
30	07:34		09:40 (30)		07:40 (30)		07:05		07:24 (33)	06:15		06:35 (100)	05:44		05:43			
	17:28	20	10:00 (30)		09:46 (30)		19:40	36	08:00 (33)	20:14	54	19:29 (115)	20:45		20:59			
31	07:33		09:46 (30)				07:03		07:22 (33)				05:44					
	17:29	9	09:55 (30)				19:41	39	08:01 (33)				20:46					
Potential sun hours	294		295				370		401				452			457		
Total, worst case	1673		113				429		2094				482					
Sun reduction	0.31		0.38				0.46		0.51				0.56					
Oper. time red.	1.00		1.00				1.00		1.00				1.00					
Wind dir. red.	0.58		0.59				0.62		0.62				0.65					
Total reduction	0.18		0.22				0.28		0.31				0.36					
Total, real	296		25				120		654				173					

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
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Project:

2015-08-31_Arkwright Summit_SFA

Printed/Page

8/31/2015 1:05 PM / 121

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 387 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1410)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

July		August		September		October		November		December	
1	05:44	06:09	06:31 (100)	06:42	71	07:03 (33)	07:14	07:34 (29)	06:50	07:26	08:56 (30)
2	05:48	06:10	06:32 (100)	06:43	65	07:04 (33)	07:15	07:35 (29)	06:51	07:27	08:57 (30)
3	05:45	06:11	06:33 (100)	06:44	59	07:05 (33)	07:16	07:36 (29)	06:52	07:29	08:57 (30)
4	05:45	06:12	06:34 (100)	06:45	57	07:06 (33)	07:17	07:37 (29)	06:53	07:30	08:57 (30)
5	05:46	06:13	06:35 (100)	06:46	55	07:07 (33)	07:18	07:38 (29)	06:54	07:31	08:57 (30)
6	05:47	06:14	06:36 (100)	06:47	53	07:08 (33)	07:19	07:39 (29)	06:55	07:32	08:57 (30)
7	05:47	06:15	06:37 (100)	06:48	51	07:09 (33)	07:20	07:40 (29)	06:56	07:33	08:57 (30)
8	05:48	06:16	06:38 (100)	06:49	49	07:10 (33)	07:21	07:41 (29)	06:57	07:34	08:57 (30)
9	05:49	06:17	06:39 (100)	06:50	47	07:11 (33)	07:22	07:42 (29)	06:58	07:35	08:57 (30)
10	05:49	06:18	06:40 (100)	06:51	44	07:12 (33)	07:23	07:43 (29)	06:59	07:36	08:57 (30)
11	05:50	06:19	06:41 (100)	06:52	42	07:13 (33)	07:24	07:44 (29)	07:00	07:37	08:57 (30)
12	05:51	06:20	06:42 (100)	06:53	39	07:14 (33)	07:25	07:45 (29)	07:01	07:38	08:57 (30)
13	05:52	06:21	06:43 (100)	06:54	36	07:15 (33)	07:26	07:46 (29)	07:02	07:39	08:57 (30)
14	05:52	06:22	06:44 (100)	06:55	33	07:16 (33)	07:27	07:47 (29)	07:03	07:40	08:57 (30)
15	05:53	06:23	06:45 (100)	06:56	30	07:17 (33)	07:28	07:48 (29)	07:04	07:41	08:57 (30)
16	05:54	06:24	06:46 (100)	06:57	29	07:18 (33)	07:29	07:49 (29)	07:05	07:42	08:57 (30)
17	05:55	06:25	06:47 (100)	06:58	25	07:19 (33)	07:30	07:50 (29)	07:06	07:43	08:57 (30)
18	05:56	06:26	06:48 (100)	06:59	22	07:20 (33)	07:31	07:51 (29)	07:07	07:44	08:57 (30)
19	05:57	06:27	06:49 (100)	07:00	23	07:21 (33)	07:32	07:52 (29)	07:08	07:45	08:57 (30)
20	05:57	06:28	06:50 (100)	07:01	23	07:22 (33)	07:33	07:53 (29)	07:09	07:46	08:57 (30)
21	05:58	06:29	06:51 (100)	07:02	23	07:23 (33)	07:34	07:54 (29)	07:10	07:47	08:57 (30)
22	05:59	06:30	06:52 (100)	07:03	22	07:24 (33)	07:35	07:55 (29)	07:11	07:48	08:57 (30)
23	06:00	06:31	06:53 (100)	07:04	22	07:25 (33)	07:36	07:56 (29)	07:12	07:49	08:57 (30)
24	06:01	06:32	06:54 (100)	07:05	21	07:26 (33)	07:37	07:57 (29)	07:13	07:50	08:57 (30)
25	06:02	06:33	06:55 (100)	07:06	20	07:27 (33)	07:38	07:58 (29)	07:14	07:51	08:57 (30)
26	06:03	06:34	06:56 (100)	07:07	19	07:28 (33)	07:39	07:59 (29)	07:15	07:52	08:57 (30)
27	06:04	06:35	06:57 (100)	07:08	17	07:29 (33)	07:40	08:00 (29)	07:16	07:53	08:57 (30)
28	06:05	06:36	06:58 (100)	07:09	16	07:30 (33)	07:41	08:01 (29)	07:17	07:54	08:57 (30)
29	06:06	06:37	06:59 (100)	07:10	14	07:31 (33)	07:42	08:02 (29)	07:18	07:55	08:57 (30)
30	06:07	06:38	07:00 (100)	07:11	12	07:32 (33)	07:43	08:03 (29)	07:19	07:56	08:57 (30)
31	06:08	06:39	07:01 (100)	07:12	10	07:33 (33)	07:44	08:04 (29)	07:20	07:57	08:57 (30)
Potential sun hours	463	431	375	1019	130	294	283	2136	0.27	1.00	0.58
Total, worst case	115	1893	0.57	1.00	0.62	0.35	0.29	0.17	0.15	0.15	0.15
Sun reduction	0.67	0.64	0.57	0.62	0.35	0.29	0.17	0.15	0.15	0.15	0.15
Oper. time red.	1.00	1.00	1.00	0.62	0.35	0.29	0.17	0.15	0.15	0.15	0.15
Wind dir. red.	0.67	0.62	0.57	0.62	0.35	0.29	0.17	0.15	0.15	0.15	0.15
Total reduction	0.44	0.39	0.35	0.35	0.29	0.29	0.17	0.15	0.15	0.15	0.15
Total, real	51	745	357	38	155	329					

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 388 - Shadow Receptor: 1.0 x 1.0 Azimuth: 0.0° Slope: 0.0° (1411)

Assumptions for shadow calculations

Sunshine probability S/S_0 (Sun hours/Possible sun hours) □

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	[January	[February	[March	[April	[May		[June		[July		[August	[September	[October	[November	[December		
1	[07:47	[07:32	[06:54	[07:01	[06:14		[05:43		[06:18 (30)	[05:44		[06:17 (30)	[06:09	[06:42	[07:14	[06:50	[07:26
	[16:55	[17:31	[18:06	[19:43	[20:15		[20:47	22	[06:40 (30)	[20:58	36	[06:53 (30)	[20:39	[19:53	[19:00	[17:12	[16:46
2	[07:47	[07:31	[06:53	[07:00	[06:12		[05:43		[06:17 (30)	[05:44		[06:17 (30)	[06:10	[06:43	[07:15	[06:51	[07:27
	[16:56	[17:32	[18:08	[19:44	[20:16		[20:47	24	[06:41 (30)	[20:58	35	[06:52 (30)	[20:38	[19:51	[18:58	[17:10	[16:46
3	[07:47	[07:30	[06:51	[06:58	[06:11		[05:42		[06:16 (30)	[05:45		[06:18 (30)	[06:11	[06:44	[07:16	[06:52	[07:29
	[16:57	[17:33	[18:09	[19:45	[20:18		[20:48	27	[06:43 (30)	[20:58	34	[06:52 (30)	[20:37	[19:49	[18:57	[17:09	[16:45
4	[07:47	[07:29	[06:49	[06:56	[06:10		[05:42		[06:15 (30)	[05:45		[06:19 (30)	[06:12	[06:45	[07:17	[06:54	[07:30
	[16:58	[17:35	[18:10	[19:46	[20:19		[20:49	28	[06:43 (30)	[20:58	33	[06:52 (30)	[20:36	[19:48	[18:55	[17:08	[16:45
5	[07:47	[07:28	[06:48	[06:54	[06:08		[05:42		[06:15 (30)	[05:46		[06:19 (30)	[06:13	[06:46	[07:18	[06:55	[07:31
	[16:59	[17:36	[18:11	[19:47	[20:20		[20:50	29	[06:44 (30)	[20:58	33	[06:52 (30)	[20:34	[19:46	[18:53	[17:07	[16:45
6	[07:47	[07:27	[06:46	[06:53	[06:07		[05:41		[06:15 (30)	[05:47		[06:21 (30)	[06:14	[06:47	[07:19	[06:56	[07:32
	[17:00	[17:37	[18:13	[19:48	[20:21		[20:50	30	[06:45 (30)	[20:58	31	[06:52 (30)	[20:33	[19:44	[18:52	[17:05	[16:45
7	[07:47	[07:25	[06:44	[06:51	[06:06		[05:41		[06:14 (30)	[05:47		[06:21 (30)	[06:15	[06:48	[07:20	[06:58	[07:33
	[17:01	[17:38	[18:14	[19:49	[20:22		[20:51	32	[06:46 (30)	[20:57	30	[06:51 (30)	[20:32	[19:43	[18:50	[17:04	[16:45
8	[07:47	[07:24	[07:43	[06:49	[06:05		[05:41		[06:13 (30)	[05:48		[06:22 (30)	[06:16	[06:49	[07:22	[06:59	[07:33
	[17:02	[17:40	[19:15	[19:51	[20:23		[20:52	33	[06:46 (30)	[20:57	28	[06:50 (30)	[20:31	[19:41	[18:48	[17:03	[16:45
9	[07:47	[07:23	[07:41	[06:48	[06:03		[05:41		[06:13 (30)	[05:49		[06:23 (30)	[06:17	[06:50	[07:23	[07:00	[07:34
	[17:03	[17:41	[19:16	[19:52	[20:24		[20:52	34	[06:47 (30)	[20:57	27	[06:50 (30)	[20:29	[19:39	[18:47	[17:02	[16:45
10	[07:46	[07:22	[07:39	[06:46	[06:02		[05:40		[06:13 (30)	[05:49		[06:23 (30)	[06:18	[06:51	[07:24	[07:01	[07:35
	[17:04	[17:42	[19:17	[19:53	[20:25		[20:53	35	[06:48 (30)	[20:56	26	[06:49 (30)	[20:28	[19:37	[18:45	[17:01	[16:45
11	[07:46	[07:20	[07:38	[06:44	[06:01		[05:40		[06:13 (30)	[05:50		[06:25 (30)	[06:19	[06:52	[07:25	[07:03	[07:36
	[17:05	[17:44	[19:18	[19:54	[20:26		[20:54	35	[06:48 (30)	[20:56	23	[06:48 (30)	[20:27	[19:36	[18:43	[17:00	[16:45
12	[07:46	[07:19	[07:36	[06:43	[06:00		[05:40		[06:13 (30)	[05:51		[06:26 (30)	[06:20	[06:53	[07:26	[07:04	[07:37
	[17:06	[17:45	[19:20	[19:55	[20:27		[20:54	36	[06:49 (30)	[20:55	21	[06:47 (30)	[20:25	[19:34	[18:42	[16:59	6 15:12 (22)
13	[07:45	[07:18	[07:34	[06:41	[05:59		[05:40		[06:13 (30)	[05:52		[06:28 (30)	[06:22	[06:54	[07:27	[07:05	[07:38
	[17:07	[17:46	[19:21	[19:56	[20:28		[20:55	36	[06:49 (30)	[20:55	18	[06:46 (30)	[20:24	[19:32	[18:40	[16:58	9 15:20 (22)
14	[07:45	[07:16	[07:32	[06:39	[05:58		[05:40		[06:13 (30)	[05:52		[06:29 (30)	[06:23	[06:55	[07:28	[07:06	[07:39
	[17:08	[17:48	[19:22	[19:57	[20:30		[20:55	37	[06:50 (30)	[20:54	15	[06:44 (30)	[20:23	[19:30	[18:38	[16:57	11 15:22 (22)
15	[07:45	[07:15	[07:31	[06:38	[05:57		[05:40		[06:13 (30)	[05:53		[06:33 (30)	[06:24	[06:57	[07:30	[07:08	[07:39
	[17:09	[17:49	[19:23	[19:58	[20:31		[20:56	37	[06:50 (30)	[20:54	9	[06:42 (30)	[20:21	[19:28	[18:37	[16:56	13 15:24 (22)
16	[07:44	[07:14	[07:29	[06:36	[05:56		[05:40		[06:13 (30)	[05:54		[06:25	[06:58	[07:31	[07:09	[07:40	15:10 (22)
	[17:10	[17:50	[19:24	[20:00	[20:32		[20:56	38	[06:51 (30)	[20:53		[20:20	[19:27	[18:35	[16:55	[16:46	14 15:24 (22)
17	[07:44	[07:12	[07:27	[06:35	[05:55		[05:40		[06:13 (30)	[05:55		[06:26	[06:59	[07:32	[07:10	[07:41	15:10 (22)
	[17:12	[17:51	[19:25	[20:00	[20:33		[20:56	38	[06:51 (30)	[20:52		[20:18	[19:25	[18:33	[16:54	[16:46	15 15:25 (22)
18	[07:43	[07:11	[07:26	[06:33	[05:54		[05:40		[06:13 (30)	[05:56		[06:27	[07:00	[07:33	[07:11	[07:41	15:09 (22)
	[17:13	[17:53	[19:27	[20:01	[20:34		[20:57	38	[06:51 (30)	[20:52		[20:17	[19:23	[18:32	[16:53	[16:46	17 15:26 (22)
19	[07:43	[07:09	[07:24	[06:31	[05:53		[05:40		[06:13 (30)	[05:57		[06:28	[07:01	[07:34	[07:12	[07:42	15:10 (22)
	[17:14	[17:54	[19:28	[20:02	[20:35		[20:57	38	[06:51 (30)	[20:51		[20:15	[19:21	[18:30	[16:53	[16:47	17 15:27 (22)
20	[07:42	[07:08	[07:22	[06:30	[05:52		[05:40		[06:13 (30)	[05:57		[06:29	[07:02	[07:35	[07:14	[07:43	15:11 (22)
	[17:15	[17:55	[19:29	[20:03	[20:36		[20:57	38	[06:51 (30)	[20:50		[20:14	[19:20	[18:29	[16:52	[16:47	17 15:28 (22)
21	[07:41	[07:07	[07:20	[06:28	[05:51		[05:40		[06:13 (30)	[05:58		[06:30	[07:03	[07:37	[07:15	[07:43	15:11 (22)
	[17:17	[17:57	[19:30	[20:04	[20:37		[20:58	38	[06:51 (30)	[20:50		[20:12	[19:18	[18:27	[16:51	[16:47	17 15:28 (22)
22	[07:41	[07:05	[07:19	[06:27	[05:50		[05:41		[06:14 (30)	[05:59		[06:31	[07:04	[07:38	[07:16	[07:44	15:12 (22)
	[17:18	[17:58	[19:31	[20:05	[20:38		[20:58	38	[06:52 (30)	[20:49		[20:11	[19:16	[18:26	[16:50	[16:48	17 15:29 (22)
23	[07:40	[07:04	[07:17	[06:25	[05:49		[05:41		[06:14 (30)	[06:00		[06:32	[07:05	[07:39	[07:17	[07:44	15:12 (22)
	[17:19	[17:59	[19:32	[20:06	[20:39		[20:58	38	[06:52 (30)	[20:48		[20:09	[19:14	[18:24	[16:50	[16:48	17 15:29 (22)
24	[07:39	[07:02	[07:15	[06:24	[05:49		[05:41		[06:14 (30)	[06:01		[06:33	[07:06	[07:40	[07:18	[07:45	15:12 (22)
	[17:20	[18:00	[19:34	[20:07	[20:40		[20:58	38	[06:52 (30)	[20:47		[20:08	[19:13	[18:23	[16:49	[16:49	17 15:29 (22)
25	[07:38	[07:00	[07:13	[06:22	[05:48		[05:41		[06:14 (30)	[06:02		[06:34	[07:07	[07:41	[07:20	[07:45	15:13 (22)
	[17:22	[18:02	[19:35	[20:09	[20:40		[20:58	38	[06:52 (30)	[20:46		[20:06	[19:11	[18:21	[16:49	[16:50	17 15:30 (22)
26	[07:38	[06:59	[07:12	[06:21	[05:47		[05:42		[06:15 (30)	[06:03		[06:35	[07:08	[07:43	[07:21	[07:45	15:14 (22)
	[17:23	[18:03	[19:36	[20:10	[20:41		[20:58	38	[06:53 (30)	[20:45		[20:04	[19:09	[18:20	[16:48	[16:50	16 15:30 (22)
27	[07:37	[06:57	[07:10	[06:19	[05:46		[05:42		[06:15 (30)	[06:04		[06:36	[07:09	[07:44	[07:22	[07:46	15:14 (22)
	[17:24	[18:04	[19:37	[20:11	[20:42		[20:59	37	[06:52 (30)	[20:44		[20:03	[19:07	[18:18	[16:48	[16:51	15 15:29 (22)
28	[07:36	[06:56	[07:08	[06:18	[05:46		[05:42		[06:16 (30)	[06:05		[06:37	[07:10	[07:45	[07:23	[07:46	15:16 (22)
	[17:25	[18:05	[19:38	[20:12	[20:43	4	[06:31 (30)	[20:59	[06:53 (30)	[20:43		[20:01	[19:05	[18:17	[16:47	[16:52	14 15:30 (22)
29	[07:35		[07:06	[06:16	[05:45		[06:22 (30)	[05:43	[06:16 (30)	[06:06		[06:39	[07:12	[07:46	[07:24	[07:46	15:17 (22)
	[17:27		[19:39	[20:13	[20:44	12	[06:34 (30)	[20:59	[06:53 (30)	[20:42		[19:58	[19:04	[18:16	[16:47	[16:52	12 15:29 (22)
30	[07:34		[07:05	[06:15	[05:44		[06:21 (30)	[05:43	[06:16 (30)	[06:07		[06:40	[07:13	[07:48	[07:25	[07:47	15:19 (22)
	[17:28		[19:40	[20:14	[20:45	16	[06:37 (30)	[20:59	[06:52 (30)	[20:41		[19:56	[19:02	[18:14	[16:46	[16:53	10 15:29 (22)
31	[07:33		[07:03		[05:44		[06:19 (30)			[06:08		[06:41		[07:49		[07:47	15:20 (22)
	[17:29		[19:41		[20:46	20	[06:39 (30)]			[20:40		[19:54		[18:13		[16:54	8 15:28 (22)
Potential sun hours	294	295	370	401	452		457		463		399	431		375		294	283
Total, worst case					56		1040			399							279
Sun reduction					0.56		0.65			0.67							0.27
Oper. time red.					1.00		1.00			1.00							1.00
Wind dir. red.					0.69		0.69			0.69							0.71
Total reduction					0.38		0.45			0.46							0.19
Total, real					20		465			184							54

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

2015-08-31_Arkwright Summit_SFA

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Licensed user:

EDR

217 Montgomery St.

US-SYRACUSE, NY 13202

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Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 389 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1412)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	January		February		March				April		May				June			
1	07:47	07:32	06:54						07:01	07:32 (30)	06:14		07:19 (30)	05:43		06:06 (33)		
	16:55	17:31	18:06						19:43	07:56 (30)	20:15	33	07:52 (30)	20:47	18	06:24 (33)		
2	07:47	07:31	06:53						07:00	07:29 (30)	06:12		07:20 (30)	05:43		06:05 (33)		
	16:56	17:32	18:08						19:44	07:58 (30)	20:16	30	07:50 (30)	20:47	19	06:24 (33)		
3	07:47	07:30	06:51						06:58	07:26 (30)	06:11		07:22 (30)	05:42		06:05 (33)		
	16:57	17:33	18:09						19:45	08:00 (30)	20:18	26	07:48 (30)	20:48	20	06:25 (33)		
4	07:47	07:29	06:49						06:56	07:24 (30)	06:10		07:24 (30)	05:42		06:04 (33)		
	16:58	17:35	18:10						19:46	08:01 (30)	20:19	22	07:46 (30)	20:49	21	06:25 (33)		
5	07:47	07:28	06:48						06:54	07:23 (30)	06:08		07:27 (30)	05:42		06:04 (33)		
	16:59	17:36	18:11						19:47	08:03 (30)	20:20	17	07:44 (30)	20:50	22	06:26 (33)		
6	07:47	07:27	06:46						06:53	07:21 (30)	06:07		07:30 (30)	05:41		06:04 (33)		
	17:00	17:37	18:13						19:48	08:03 (30)	20:21	9	07:39 (30)	20:50	22	06:26 (33)		
7	07:47	07:25	06:44						06:51	07:20 (30)	06:06			05:41		06:04 (33)		
	17:01	17:38	18:14						19:49	08:04 (30)	20:22			20:51	23	06:27 (33)		
8	07:47	07:24	07:43						06:49	07:19 (30)	06:05			05:41		06:03 (33)		
	17:02	17:40	19:15						19:51	08:05 (30)	20:23			20:52	24	06:27 (33)		
9	07:47	07:23	07:41						06:48	07:18 (30)	06:03			05:40		06:03 (33)		
	17:03	17:41	19:16						19:52	08:05 (30)	20:24			20:52	24	06:27 (33)		
10	07:46	07:22	07:39						06:46	07:16 (30)	06:02			05:40		06:03 (33)		
	17:04	17:42	19:17						19:53	08:05 (30)	20:25			20:53	25	06:28 (33)		
11	07:46	07:20	07:38						06:44	07:16 (30)	06:01			05:40		06:03 (33)		
	17:05	17:44	19:18						19:54	08:06 (30)	20:26			20:54	25	06:28 (33)		
12	07:46	07:19	07:36						06:43	07:15 (30)	06:00			05:40		06:03 (33)		
	17:06	17:45	19:20						19:55	08:06 (30)	20:27			20:54	26	06:29 (33)		
13	07:45	07:18	07:34						06:41	07:14 (30)	05:59			05:40		06:03 (33)		
	17:07	17:46	19:21						19:56	08:05 (30)	20:28			20:55	26	06:29 (33)		
14	07:45	07:16	07:32						06:39	07:14 (30)	05:58			05:40		06:03 (33)		
	17:08	17:48	19:22						19:57	08:06 (30)	20:30			20:55	26	06:29 (33)		
15	07:45	07:15	07:31						06:38	07:13 (30)	05:57			05:40		06:03 (33)		
	17:09	17:49	19:23						19:58	08:05 (30)	20:31			20:56	27	06:30 (33)		
16	07:44	07:14	07:29						06:36	07:14 (30)	05:56			05:40		06:03 (33)		
	17:10	17:50	19:24						20:00	08:06 (30)	20:32			20:56	27	06:30 (33)		
17	07:44	07:12	07:27						06:35	07:13 (30)	05:55			05:40		06:03 (33)		
	17:12	17:51	19:25						20:00	08:05 (30)	20:33			20:56	27	06:30 (33)		
18	07:43	07:11	07:26						06:33	07:12 (30)	05:54			05:40		06:03 (33)		
	17:13	17:53	19:27						20:01	08:04 (30)	20:34			20:57	27	06:30 (33)		
19	07:43	07:09	07:24						06:31	07:13 (30)	05:53			05:40		06:03 (33)		
	17:14	17:54	19:28						20:02	08:04 (30)	20:35			20:57	27	06:30 (33)		
20	07:42	07:08	07:22						06:30	07:12 (30)	05:52			05:40		06:03 (33)		
	17:15	17:55	19:29						20:03	08:03 (30)	20:36			20:57	28	06:31 (33)		
21	07:41	07:07	07:20						06:28	07:13 (30)	05:51			05:40		06:03 (33)		
	17:17	17:57	19:30						20:04	08:03 (30)	20:37			20:58	28	06:31 (33)		
22	07:41	07:05	07:19						06:27	07:13 (30)	05:50			05:41		06:04 (33)		
	17:18	17:58	19:31						20:05	08:02 (30)	20:38			20:58	28	06:32 (33)		
23	07:40	07:04	07:17						06:25	07:13 (30)	05:49			05:41		06:04 (33)		
	17:19	17:59	19:32						20:06	08:01 (30)	20:39			20:58	28	06:32 (33)		
24	07:39	07:02	07:15						06:24	07:13 (30)	05:48		06:10 (33)	05:41		06:04 (33)		
	17:20	18:00	19:34						20:07	08:00 (30)	20:40	4	06:14 (33)	20:58	27	06:31 (33)		
25	07:38	07:00	07:13						06:22	07:14 (30)	05:48		06:09 (33)	05:41		06:04 (33)		
	17:22	18:02	19:35						20:09	08:00 (30)	20:40	7	06:16 (33)	20:58	27	06:31 (33)		
26	07:38	06:59	07:12						06:21	07:15 (30)	05:47		06:09 (33)	05:42		06:05 (33)		
	17:23	18:03	19:36						20:10	07:59 (30)	20:41	9	06:18 (33)	20:58	27	06:32 (33)		
27	07:37	06:57	07:10						06:19	07:15 (30)	05:46		06:08 (33)	05:42		06:05 (33)		
	17:24	18:04	19:37						20:11	07:57 (30)	20:42	11	06:19 (33)	20:59	27	06:32 (33)		
28	07:36	06:56	07:08						06:18	07:16 (30)	05:46		06:08 (33)	05:42		06:06 (33)		
	17:25	18:05	19:38						20:12	07:57 (30)	20:43	13	06:21 (33)	20:59	27	06:33 (33)		
29	07:35		07:06						06:16	07:16 (30)	05:45		06:07 (33)	05:43		06:06 (33)		
	17:27		19:39						20:13	07:55 (30)	20:44	14	06:21 (33)	20:59	26	06:32 (33)		
30	07:34		07:05						06:15	07:18 (30)	05:44		06:07 (33)	05:43		06:06 (33)		
	17:28		19:40						20:14	07:54 (30)	20:45	16	06:23 (33)	20:59	26	06:32 (33)		
31	07:33		07:03					07:36 (30)			05:44		06:06 (33)					
	17:29		19:41					07:52 (30)			20:46	17	06:23 (33)					
Potential sun hours	294	295	370			16		07:36 (30)	401		452			457				
Total, worst case						16			1348		228			755				
Sun reduction						0.46			0.51		0.56			0.65				
Oper. time red.						1.00			1.00		1.00			1.00				
Wind dir. red.						0.63			0.63		0.65			0.69				
Total reduction						0.29			0.32		0.36			0.45				
Total, real						5			430		83			336				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

2015-08-31_Arkwright Summit_SFA

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Licensed user:

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Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 389 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1412)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

July	August	September	October	November	December
1 05:44	06:07 (33) 06:09	06:42	07:15 (30) 07:14	06:50	07:26
2 05:44	26 06:33 (33) 06:10	19:53	08:05 (30) 19:00	17:12	16:46
3 05:45	25 06:32 (33) 06:11	19:51	08:04 (30) 18:58	17:10	16:46
4 05:45	25 06:33 (33) 06:12	19:49	08:03 (30) 18:57	17:09	16:45
5 05:46	24 06:32 (33) 06:13	19:48	08:02 (30) 18:55	17:08	16:45
6 05:47	23 06:31 (33) 06:14	19:47	08:01 (30) 18:53	17:07	16:45
7 05:47	23 06:33 (33) 06:15	19:44	07:59 (30) 18:52	17:05	16:45
8 05:48	22 06:32 (33) 06:16	12 07:50 (30) 19:43	40 07:58 (30) 18:50	17:04	16:45
9 05:49	21 06:31 (33) 06:17	19 07:53 (30) 19:41	37 07:56 (30) 18:48	17:03	16:45
10 05:49	20 06:32 (33) 06:18	24 07:56 (30) 19:39	34 07:54 (30) 18:47	17:02	16:45
11 05:50	19 06:31 (33) 06:19	28 07:58 (30) 19:37	30 07:52 (30) 18:45	17:01	16:45
12 05:51	18 06:31 (33) 06:20	31 07:59 (30) 19:36	25 07:49 (30) 18:43	17:00	16:45
13 05:52	17 06:31 (33) 06:22	35 08:01 (30) 19:34	18 07:45 (30) 18:42	16:59	16:45
14 05:52	16 06:31 (33) 06:23	37 08:02 (30) 19:32	2 07:37 (30) 18:40	16:58	16:45
15 05:53	15 06:30 (33) 06:24	39 08:03 (30) 19:30	07:28	16:57	16:45
16 05:54	13 06:29 (33) 06:25	41 08:05 (30) 19:28	18:38	16:56	16:45
17 05:55	12 06:29 (33) 06:26	43 08:06 (30) 19:27	18:37	16:55	16:46
18 05:56	10 06:28 (33) 06:27	45 08:07 (30) 19:25	18:36	16:54	16:46
19 05:57	8 06:27 (33) 06:28	47 08:08 (30) 19:23	18:35	16:53	16:46
20 05:57	6 06:25 (33) 06:29	48 08:09 (30) 19:21	18:34	16:52	16:47
21 05:58	5 06:24 (33) 06:30	49 08:10 (30) 19:19	18:33	16:51	16:47
22 05:59	4 06:23 (33) 06:31	50 08:11 (30) 19:18	18:32	16:50	16:48
23 06:00	3 06:22 (33) 06:32	51 08:12 (30) 19:16	18:31	16:49	16:48
24 06:01	2 06:21 (33) 06:33	52 08:13 (30) 19:14	18:30	16:48	16:49
25 06:02	1 06:20 (33) 06:34	53 08:14 (30) 19:13	18:29	16:47	16:50
26 06:03	0 06:19 (33) 06:35	54 08:15 (30) 19:11	18:28	16:46	16:50
27 06:04	0 06:18 (33) 06:36	55 08:16 (30) 19:09	18:27	16:45	16:51
28 06:05	0 06:17 (33) 06:37	56 08:17 (30) 19:07	18:26	16:44	16:51
29 06:06	0 06:16 (33) 06:38	57 08:18 (30) 19:05	18:25	16:43	16:52
30 06:07	0 06:15 (33) 06:39	58 08:19 (30) 19:04	18:24	16:42	16:52
31 06:08	0 06:14 (33) 06:40	59 08:20 (30) 19:02	18:23	16:41	16:53
Potential sun hours	463	431	375	343	294
Total, worst case	345	1057	464		
Sun reduction	0.67	0.64	0.57		
Oper. time red.	1.00	1.00	1.00		
Wind dir. red.	0.69	0.63	0.63		
Total reduction	0.46	0.40	0.36		
Total, real	158	423	165		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

2015-08-31_Arkwright Summit_SFA

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Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 391 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1414)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

January			February			March			April			May			June		
1	07:47	07:32	06:54						07:01			07:21 (102)	06:14			05:43	06:16 (27)
	16:55	17:31	18:06						19:43	21		07:42 (102)	20:15			20:47	06:23 (27)
2	07:47	07:31	06:53						07:00			07:19 (102)	06:12			05:43	06:18 (27)
	16:56	17:32	18:08						19:44	22		07:41 (102)	20:16			20:47	06:20 (27)
3	07:47	07:30	06:51						06:58			07:17 (102)	06:11			05:42	
	16:57	17:33	18:09						19:45	22		07:39 (102)	20:17			20:48	
4	07:47	07:29	06:49						06:56			07:18 (102)	06:10			05:42	
	16:58	17:35	18:10						19:46	19		07:37 (102)	20:19			20:49	
5	07:47	07:28	06:48						06:54			07:20 (102)	06:08			05:42	
	16:59	17:36	18:11						19:47	16		07:36 (102)	20:20			20:50	
6	07:47	07:27	06:46						06:53			07:23 (102)	06:07			05:41	
	17:00	17:37	18:13						19:48	9		07:32 (102)	20:21			20:50	
7	07:47	07:25	06:44						06:51				06:06		06:26 (27)	05:41	
	17:01	17:38	18:14						19:49				20:22	2	06:28 (27)	20:51	
8	07:47	07:24	07:43						06:49				06:05		06:25 (27)	05:41	
	17:02	17:40	19:15						19:50				20:23	4	06:29 (27)	20:52	
9	07:47	07:23	07:41						06:48				06:03		06:24 (27)	05:40	
	17:03	17:41	19:16						19:52				20:24	6	06:30 (27)	20:52	
10	07:46	07:22	07:39						06:46				06:02		06:23 (27)	05:40	
	17:04	17:42	19:17						19:53				20:25	7	06:30 (27)	20:53	
11	07:46	07:20	07:38						06:44				06:01		06:22 (27)	05:40	
	17:05	17:44	19:18						19:54				20:26	9	06:31 (27)	20:53	
12	07:46	07:19	07:36					18:49 (22)	06:43				06:00		06:21 (27)	05:40	
	17:06	17:45	19:20	8				18:57 (22)	19:55				20:27	10	06:31 (27)	20:54	
13	07:45	07:18	07:34					18:47 (22)	06:41				05:59		06:20 (27)	05:40	
	17:07	17:46	19:21	12				18:59 (22)	19:56				20:28	11	06:31 (27)	20:55	
14	07:45	07:16	07:32					18:45 (22)	06:39				05:58		06:19 (27)	05:40	
	17:08	17:48	19:22	15				19:00 (22)	19:57				20:29	13	06:32 (27)	20:55	
15	07:45	07:15	07:31					18:43 (22)	06:38				05:57		06:18 (27)	05:40	
	17:09	17:49	19:23	18				19:01 (22)	19:58				20:31	14	06:32 (27)	20:55	
16	07:44	07:14	07:29					18:42 (22)	06:36				05:56		06:17 (27)	05:40	
	17:10	17:50	19:24	20				19:02 (22)	19:59				20:32	15	06:32 (27)	20:56	
17	07:44	07:12	07:27					18:42 (22)	06:34				05:55		06:16 (27)	05:40	
	17:12	17:51	19:25	22				19:04 (22)	20:01				20:33	15	06:31 (27)	20:56	
18	07:43	07:11	07:26					18:41 (22)	06:33				05:54		06:15 (27)	05:40	
	17:13	17:53	19:27	24				19:05 (22)	20:01				20:34	16	06:31 (27)	20:57	
19	07:43	07:09	07:24					18:40 (22)	06:31				05:53		06:14 (27)	05:40	
	17:14	17:54	19:28	25				19:05 (22)	20:02				20:35	17	06:31 (27)	20:57	
20	07:42	07:08	07:22					18:40 (22)	06:30				05:52		06:13 (27)	05:40	
	17:15	17:55	19:29	24				19:04 (22)	20:03				20:36	18	06:31 (27)	20:57	
21	07:41	07:06	07:20					07:40 (102)	06:28				05:51		06:12 (27)	05:40	
	17:17	17:57	19:30	26				19:05 (22)	20:04				20:37	18	06:30 (27)	20:58	
22	07:41	07:05	07:19					07:38 (102)	06:27				05:50		06:12 (27)	05:41	
	17:18	17:58	19:31	27				19:03 (22)	20:05				20:38	19	06:31 (27)	20:58	
23	07:40	07:03	07:17					07:36 (102)	06:25				05:49		06:11 (27)	05:41	
	17:19	17:59	19:32	29				19:02 (22)	20:06				20:39	19	06:30 (27)	20:58	
24	07:39	07:02	07:15					07:34 (102)	06:24				05:48		06:10 (27)	05:41	
	17:20	18:00	19:33	28				19:00 (22)	20:07				20:40	19	06:29 (27)	20:58	
25	07:38	07:00	07:13					07:33 (102)	06:22				05:48		06:09 (27)	05:41	
	17:22	18:02	19:35	27				18:59 (22)	20:09				20:40	19	06:28 (27)	20:58	
26	07:38	06:59	07:12					07:31 (102)	06:21				05:47		06:09 (27)	05:42	
	17:23	18:03	19:36	24				18:56 (22)	20:10				20:41	20	06:29 (27)	20:58	
27	07:37	06:57	07:10					07:29 (102)	06:19				05:46		06:09 (27)	05:42	
	17:24	18:04	19:37	16				07:45 (102)	20:11				20:42	19	06:28 (27)	20:59	
28	07:36	06:56	07:08					07:27 (102)	06:18				05:46		06:10 (27)	05:42	
	17:25	18:05	19:38	17				07:44 (102)	20:12				20:43	18	06:28 (27)	20:59	
29	07:35		07:06					07:26 (102)	06:16				05:45		06:11 (27)	05:43	
	17:27		19:39	19				07:45 (102)	20:13				20:44	15	06:26 (27)	20:59	
30	07:34		07:05					07:24 (102)	06:15				05:44		06:13 (27)	05:43	
	17:28		19:40	20				07:44 (102)	20:14				20:45	13	06:26 (27)	20:59	
31	07:33		07:03					07:22 (102)					05:44		06:13 (27)		
	17:29		19:41	21				07:43 (102)					20:46	11	06:24 (27)		
Potential sun hours	294	295	370					401				452			457		
Total, worst case				422				109				347			9		
Sun reduction				0.46				0.51				0.56			0.65		
Oper. time red.				1.00				1.00				1.00			1.00		
Wind dir. red.				0.63				0.62				0.68			0.68		
Total reduction				0.29				0.32				0.38			0.44		
Total, real				121				34				131			4		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 126

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110Shadow receptor: 391 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1414)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

July	August	September	October	November	December
1 05:44	06:09	06:31 (27) 06:42	07:14	18:27 (22) 06:50	07:26
20:58	20:39	10 06:41 (27) 19:53	19:00	11 18:38 (22) 17:12	16:46
2 05:44	06:10	06:32 (27) 06:43	07:15	18:30 (22) 06:51	07:27
20:58	20:38	8 06:40 (27) 19:51	18:58	6 18:36 (22) 17:10	16:46
3 05:45	06:11	06:33 (27) 06:44	07:16	06:52	07:28
20:58	20:37	7 06:40 (27) 19:49	18:57	17:09	16:45
4 05:45	06:12	06:34 (27) 06:45	07:17	06:54	07:30
20:58	20:36	5 06:39 (27) 19:48	18:55	17:08	16:45
5 05:46	06:13	06:35 (27) 06:46	07:18	06:55	07:31
20:58	20:34	3 06:38 (27) 19:46	18:53	17:07	16:45
6 05:47	06:14	06:36 (27) 06:47	07:19 (102) 07:19	06:56	07:32
20:58	20:33	1 06:37 (27) 19:44	8 07:27 (102) 18:52	17:05	16:45
7 05:47	06:15	06:48	07:16 (102) 07:20	06:57	07:32
20:57	20:32	19:42	14 07:30 (102) 18:50	17:04	16:45
8 05:48	06:16	06:49	07:13 (102) 07:21	06:59	07:33
20:57	20:31	19:41	19 07:32 (102) 18:48	17:03	16:45
9 05:49	06:17	06:50	07:11 (102) 07:23	07:00	07:34
20:57	20:29	19:39	22 07:33 (102) 18:46	17:02	16:45
10 05:49	06:18	06:51	07:12 (102) 07:24	07:01	07:35
20:56	20:28	19:37	22 07:34 (102) 18:45	17:01	16:45
11 05:50	06:24 (27) 06:19	06:52	07:13 (102) 07:25	07:02	07:36
20:56	6 06:30 (27) 20:27	19:35	22 07:35 (102) 18:43	17:00	16:45
12 05:51	06:22 (27) 06:20	06:53	07:14 (102) 07:26	07:04	07:37
20:55	10 06:32 (27) 20:25	19:34	21 07:35 (102) 18:42	16:59	16:45
13 05:52	06:21 (27) 06:22	06:54	07:15 (102) 07:27	07:05	07:38
20:55	13 06:34 (27) 20:24	19:32	20 07:35 (102) 18:40	16:58	16:45
14 05:52	06:20 (27) 06:23	06:55	07:16 (102) 07:28	07:06	07:39
20:54	14 06:34 (27) 20:23	19:30	19 07:35 (102) 18:38	16:57	16:45
15 05:53	06:19 (27) 06:24	06:57	07:17 (102) 07:29	07:07	07:39
20:54	16 06:35 (27) 20:21	19:28	18 07:35 (102) 18:37	16:56	16:45
16 05:54	06:19 (27) 06:25	06:58	07:18 (102) 07:31	07:09	07:40
20:53	18 06:37 (27) 20:20	19:27	16 07:34 (102) 18:35	16:55	16:46
17 05:55	06:18 (27) 06:26	06:59	07:19 (102) 07:32	07:10	07:41
20:52	20 06:38 (27) 20:18	19:25	23 18:44 (22) 18:33	16:54	16:46
18 05:56	06:19 (27) 06:27	07:00	07:20 (102) 07:33	07:11	07:41
20:52	20 06:39 (27) 20:17	19:23	28 18:46 (22) 18:32	16:53	16:46
19 05:57	06:19 (27) 06:28	07:01	07:21 (102) 07:34	07:12	07:42
20:51	19 06:38 (27) 20:15	19:21	29 18:47 (22) 18:30	16:53	16:47
20 05:57	06:20 (27) 06:29	07:02	07:22 (102) 07:35	07:14	07:43
20:50	19 06:39 (27) 20:14	19:20	28 18:48 (22) 18:29	16:52	16:47
21 05:58	06:21 (27) 06:30	07:03	07:23 (102) 07:37	07:15	07:43
20:50	19 06:40 (27) 20:12	19:18	29 18:49 (22) 18:27	16:51	16:47
22 05:59	06:22 (27) 06:31	07:04	07:24 (102) 07:38	07:16	07:44
20:49	18 06:40 (27) 20:11	19:16	27 18:49 (22) 18:26	16:50	16:48
23 06:00	06:23 (27) 06:32	07:05	18:24 (22) 07:39	07:17	07:44
20:48	18 06:41 (27) 20:09	19:14	25 18:49 (22) 18:24	16:50	16:48
24 06:01	06:24 (27) 06:33	07:06	18:24 (22) 07:40	07:18	07:45
20:47	17 06:41 (27) 20:07	19:12	25 18:49 (22) 18:23	16:49	16:49
25 06:02	06:25 (27) 06:34	07:07	18:23 (22) 07:41	07:20	07:45
20:46	17 06:42 (27) 20:06	19:11	25 18:48 (22) 18:21	16:49	16:50
26 06:03	06:26 (27) 06:35	07:08	18:24 (22) 07:43	07:21	07:45
20:45	16 06:42 (27) 20:04	19:09	23 18:47 (22) 18:20	16:48	16:50
27 06:04	06:27 (27) 06:36	07:09	18:24 (22) 07:44	07:22	07:46
20:44	15 06:42 (27) 20:03	19:07	21 18:45 (22) 18:18	16:48	16:51
28 06:05	06:28 (27) 06:37	07:10	18:24 (22) 07:45	07:23	07:46
20:43	14 06:42 (27) 20:01	19:05	19 18:43 (22) 18:17	16:47	16:52
29 06:06	06:29 (27) 06:39	07:12	18:25 (22) 07:46	07:24	07:46
20:42	13 06:42 (27) 19:58	19:04	16 18:41 (22) 18:16	16:47	16:52
30 06:07	06:30 (27) 06:40	07:13	18:26 (22) 07:47	07:25	07:47
20:41	12 06:42 (27) 19:56	19:02	14 18:40 (22) 18:14	16:46	16:53
31 06:08	06:30 (27) 06:41		07:49		07:47
20:40	11 06:41 (27) 19:54		18:13		16:54
Potential sun hours 463	431	375	343	294	283
Total, worst case	325	34	533	17	
Sun reduction	0.67	0.64	0.57	0.50	
Oper. time red.	1.00	1.00	1.00	1.00	
Wind dir. red.	0.68	0.68	0.63	0.63	
Total reduction	0.45	0.43	0.36	0.31	
Total, real	147	15	190	5	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker
			(WTG causing flicker last time)

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 1:05 PM / 127

Licensed user:

EDR

217 Montgomery St.

US-SYRACUSE, NY 13202

(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110Shadow receptor: 392 - Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1415)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117		541	386	285 8,759

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:47 16:55 17:31	07:32 17:31 18:07	06:54 18:07 19:43	07:01 19:43 20:15	06:14 20:15 20:47	05:43 20:47 20:59	06:24 (115) 20:59 20:59	06:32 (115) 20:39 20:39	06:41 (115) 20:39 20:39	06:42 19:53 19:00	06:50 17:12 16:46	07:26 16:46 16:46
2	07:47 16:56 17:32	07:31 17:32 18:08	06:53 18:08 19:44	07:00 19:44 20:16	06:12 20:16 20:48	05:43 20:48 20:58	06:24 (115) 20:58 20:58	06:32 (115) 20:38 20:38	06:43 (115) 20:38 20:38	06:43 19:51 18:59	06:51 17:10 16:45	07:28 16:45 16:45
3	07:47 16:57 17:33	07:30 17:33 18:09	06:51 18:09 19:45	06:58 19:45 20:18	06:11 20:18 20:49	05:43 20:49 20:58	06:24 (115) 20:58 20:58	06:32 (115) 20:37 20:37	06:44 20:37 20:37	06:44 19:49 18:57	06:53 17:09 16:45	07:29 16:45 16:45
4	07:47 16:58 17:35	07:29 17:35 18:10	06:49 18:10 19:46	06:56 19:46 20:19	06:10 20:19 20:50	05:42 20:50 20:58	06:24 (115) 20:58 20:58	06:32 (115) 20:36 20:36	06:45 20:36 20:36	06:45 19:48 18:55	06:54 17:08 16:45	07:30 16:45 16:45
5	07:47 16:59 17:36	07:28 17:36 18:11	06:48 18:11 19:47	06:54 19:47 20:20	06:08 20:20 20:51	05:42 20:51 20:58	06:25 (115) 20:58 20:58	06:32 (115) 20:34 20:34	06:46 20:34 20:34	06:46 19:46 18:52	06:55 17:07 16:45	07:31 16:45 16:45
6	07:47 17:00 17:37	07:27 17:37 18:13	06:46 18:13 19:48	06:53 19:48 20:21	06:07 20:21 20:52	05:41 20:52 20:58	06:26 (115) 20:58 20:58	06:32 (115) 20:33 20:33	06:47 20:33 20:33	06:47 19:44 18:52	06:56 17:06 16:45	07:32 16:45 16:45
7	07:47 17:01 17:39	07:25 17:39 18:14	06:44 18:14 19:49	06:51 19:49 20:22	06:06 20:22 20:53	05:41 20:53 20:58	06:26 (115) 20:57 20:57	06:31 (115) 20:32 20:32	06:48 20:32 20:32	06:48 19:43 18:50	06:58 17:04 16:45	07:33 16:45 16:45
8	07:47 17:02 17:40	07:24 17:40 19:15	07:43 19:15 19:51	06:49 19:51 20:23	06:05 20:23 20:54	05:41 20:54 20:58	06:26 (115) 20:57 20:57	06:32 (115) 20:31 20:31	06:49 20:31 20:31	06:49 19:41 18:48	06:59 17:03 16:45	07:34 16:45 16:45
9	07:47 17:03 17:41	07:23 17:41 19:16	07:41 19:16 19:52	06:48 19:52 20:24	06:03 20:24 20:55	05:41 20:55 20:58	06:27 (115) 20:57 20:57	06:32 (115) 20:29 20:29	06:50 20:29 20:29	06:50 19:39 18:47	07:00 17:02 16:45	07:34 16:45 16:45
10	07:46 17:04 17:42	07:22 17:42 19:17	07:39 19:17 19:53	06:46 19:53 20:25	06:02 20:25 20:56	05:40 20:56 20:58	06:27 (115) 20:56 20:56	06:31 (115) 20:28 20:28	06:51 20:28 20:28	06:51 19:37 18:45	07:01 17:01 16:45	07:35 16:45 16:45
11	07:46 17:05 17:44	07:21 17:44 19:19	07:38 19:19 19:54	06:44 19:54 20:26	06:01 20:26 20:57	05:40 20:57 20:58	06:28 (115) 20:56 20:56	06:31 (115) 20:27 20:27	06:52 20:27 20:27	06:52 19:36 18:43	07:03 17:00 16:45	07:36 16:45 16:45
12	07:46 17:06 17:45	07:19 17:45 19:20	07:36 19:20 19:55	06:43 19:55 20:27	06:00 20:27 20:58	05:40 20:58 20:58	06:29 (115) 20:55 20:55	06:32 (115) 20:25 20:25	06:53 20:25 20:25	06:53 19:34 18:42	07:04 16:59 16:45	07:37 16:45 16:45
13	07:46 17:07 17:46	07:18 17:46 19:21	07:34 19:21 19:56	06:41 19:56 20:29	05:59 20:29 20:59	05:40 20:59 20:59	06:29 (115) 20:55 20:55	06:32 (115) 20:24 20:24	06:54 20:24 20:24	06:54 19:32 18:40	07:05 16:58 16:45	07:38 16:45 16:45
14	07:45 17:08 17:48	07:17 17:48 19:22	07:33 19:22 19:57	06:39 19:57 20:30	05:58 20:30 20:59	05:40 20:59 20:59	06:27 (115) 20:55 20:55	06:31 (115) 20:23 20:23	06:56 20:23 20:23	06:56 19:30 18:38	07:06 16:57 16:45	07:39 16:45 16:45
15	07:45 17:09 17:49	07:15 17:49 19:23	07:31 19:23 19:58	06:38 19:58 20:31	05:57 20:31 20:59	05:40 20:59 20:59	06:26 (115) 20:56 20:56	06:31 (115) 20:21 20:21	06:57 20:21 20:21	06:57 19:29 18:37	07:08 16:56 16:45	07:39 16:45 16:45
16	07:44 17:11 17:50	07:14 17:50 19:24	07:29 19:24 19:59	06:36 19:59 20:32	05:56 20:32 20:59	05:40 20:59 20:59	06:25 (115) 20:56 20:56	06:30 (115) 20:20 20:20	06:58 20:20 20:20	06:58 19:27 18:35	07:09 16:55 16:45	07:40 16:45 16:45
17	07:44 17:12 17:52	07:12 17:52 19:26	07:27 19:26 19:59	06:35 19:59 20:33	05:55 20:33 20:59	05:40 20:59 20:59	06:24 (115) 20:56 20:56	06:30 (115) 20:18 20:18	06:59 20:18 20:18	06:59 19:25 18:32	07:10 16:54 16:45	07:41 16:45 16:45
18	07:43 17:13 17:53	07:11 17:53 19:27	07:26 19:27 19:59	06:33 19:59 20:34	05:54 20:34 20:59	05:40 20:59 20:59	06:23 (115) 20:57 20:57	06:30 (115) 20:17 20:17	06:59 20:17 20:17	06:59 19:23 18:32	07:11 16:54 16:45	07:41 16:45 16:45
19	07:43 17:14 17:54	07:10 17:54 19:28	07:24 19:28 19:59	06:31 19:59 20:35	05:53 20:35 20:59	05:40 20:59 20:59	06:23 (115) 20:57 20:57	06:30 (115) 20:15 20:15	06:59 20:15 20:15	06:59 19:21 18:30	07:13 16:53 16:45	07:42 16:45 16:45
20	07:42 17:15 17:55	07:08 17:55 19:29	07:22 19:29 19:59	06:30 19:59 20:36	05:52 20:36 20:59	05:40 20:59 20:59	06:22 (115) 20:57 20:57	06:31 (115) 20:14 20:14	06:59 20:14 20:14	06:59 19:20 18:29	07:14 16:52 16:45	07:43 16:45 16:45
21	07:41 17:17 17:57	07:07 17:57 19:30	07:20 19:30 19:59	06:28 19:59 20:37	05:51 20:37 20:59	05:40 20:59 20:59	06:22 (115) 20:58 20:58	06:31 (115) 20:12 20:12	06:59 20:12 20:12	06:59 19:18 18:27	07:15 16:51 16:45	07:43 16:45 16:45
22	07:41 17:18 17:58	07:05 17:58 19:31	07:19 19:31 19:59	06:27 19:59 20:38	05:50 20:38 20:59	05:40 20:59 20:59	06:23 (115) 20:58 20:58	06:32 (115) 20:11 20:11	06:59 20:11 20:11	06:59 19:16 18:26	07:16 16:51 16:45	07:44 16:45 16:45
23	07:40 17:19 17:59	07:04 17:59 19:32	07:17 19:32 19:59	06:25 19:59 20:39	05:49 20:39 20:59	05:40 20:59 20:59	06:22 (115) 20:58 20:58	06:32 (115) 20:09 20:09	06:59 20:09 20:09	06:59 19:14 18:24	07:17 16:50 16:45	07:44 16:45 16:45
24	07:39 17:20 18:00	07:02 18:00 19:34	07:15 19:34 19:59	06:24 19:59 20:40	05:49 20:40 20:59	05:40 20:59 20:59	06:22 (115) 20:58 20:58	06:33 (115) 20:07 20:07	06:59 20:07 20:07	06:59 19:13 18:23	07:19 16:49 16:45	07:45 16:45 16:45
25	07:38 17:22 18:02	07:01 18:02 19:35	07:13 19:35 19:59	06:22 19:59 20:41	05:48 20:41 20:59	05:40 20:59 20:59	06:23 (115) 20:58 20:58	06:32 (115) 20:06 20:06	06:59 20:06 20:06	06:59 19:11 18:21	07:20 16:49 16:45	07:45 16:45 16:45
26	07:38 17:23 18:03	06:59 18:03 19:36	07:12 19:36 19:59	06:21 19:59 20:41	05:47 20:41 20:59	05:40 20:59 20:59	06:22 (115) 20:58 20:58	06:32 (115) 20:04 20:04	06:59 20:04 20:04	06:59 19:09 18:20	07:21 16:48 16:45	07:46 16:45 16:45
27	07:37 17:24 18:04	06:57 18:04 19:37	07:10 19:37 19:59	06:19 19:59 20:42	05:46 20:42 20:59	05:40 20:59 20:59	06:22 (115) 20:59 20:59	06:32 (115) 20:03 20:03	06:59 20:03 20:03	06:59 19:07 18:18	07:22 16:48 16:45	07:46 16:45 16:45
28	07:36 17:25 18:05	06:56 18:05 19:38	07:08 19:38 19:59	06:18 19:59 20:43	05:46 20:43 20:59	05:40 20:59 20:59	06:23 (115) 20:58 20:58	06:32 (115) 20:03 20:03	06:59 20:03 20:03	06:59 19:06 18:17	07:23 16:47 16:45	07:46 16:45 16:45
29	07:35 17:27 18:07	06:55 18:07 19:40	07:07 19:40 19:59	06:16 19:59 20:44	05:45 20:44 20:59	05:40 20:59 20:59	06:23 (115) 20:58 20:58	06:32 (115) 20:02 20:02	06:59 20:02 20:02	06:59 19:04 18:16	07:24 16:47 16:45	07:46 16:45 16:45
30	07:34 17:28 18:08	06:54 18:08 19:41	07:06 19:41 19:59	06:15 19:59 20:45	05:45 20:45 20:59	05:40 20:59 20:59	06:23 (115) 20:59 20:59	06:32 (115) 20:01 20:01	06:59 20:01 20:01	06:59 19:02 18:14	07:25 16:46 16:45	07:47 16:45 16:45
31	07:33 17:29	07:03 19:42	07:03 19:42	07:03 19:42	07:03 19:42	07:03 19:42	07:03 19:42	07:03 19:42	07:03 19:42	07:03 19:42	07:03 19:42	07:03 19:42
Potential sun hours	294	295	370	401	452	457	463	431	375	343	294	283
Total, worst case					528	684	798					
Sun reduction					0.56	0.65	0.67					
Oper. time red.					1.00	1.00	1.00					
Wind dir. red.					0.67	0.67	0.67					
Total reduction					0.38	0.44	0.45					
Total, real					199	300	360					

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

2015-08-31_Arkwright Summit_SFA

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Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110WTG: 10 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (122)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

January		February		March		April		May		June	
1	07:47 16:55	07:32 17:31	16:19-16:42/23 16:42-16:46/4	06:54 18:06	07:01 19:43	06:14 20:15	06:34-06:49/15 18:55-19:09/14	05:43 20:46			
2	07:47 16:56	07:31 17:32	16:18-16:44/26 16:44-16:46/2	06:52 18:08	06:59 19:44	06:12 20:16	06:32-06:47/15 18:58-19:04/6	05:43 20:47			
3	07:47 16:57	07:30 17:33	16:17-16:46/29 16:45-16:49/4	06:51 18:09	06:58 19:45	06:11 20:17	06:31-06:46/15 20:17	05:42 20:48			
4	07:47 16:58	07:29 17:35	16:15-16:46/31 16:45-16:52/7	06:49 18:10	06:56 19:46	06:10 20:19	06:31-06:45/14 20:19	05:42 20:49			
5	07:47 16:59	07:28 17:36	16:15-16:47/32 16:47-16:53/6	06:48 18:11	06:54 19:47	06:08 20:20	06:33-06:43/10 20:20	05:42 20:50			
6	07:47 17:00	07:26 17:37	16:14-16:48/34 16:48-16:55/7	06:46 18:12	06:53 19:48	06:07 20:21	20:21	05:41 20:50			
7	07:47 17:01	07:25 17:38	16:14-16:49/35 16:49-16:56/7	06:44 18:14	06:51 19:49	19:02-19:12/10 20:22	06:06 20:22	05:41 20:51			
8	07:47 17:02	07:24 17:40	16:14-16:49/35 16:49-16:57/8	07:43 19:15	06:49 19:50	18:58-19:16/18 20:23	06:05 20:23	05:41 20:52			
9	07:46 17:03	07:23 17:41	16:13-16:49/36 16:49-16:57/8	07:41 19:16	06:48 19:52	18:55-19:17/22 20:24	06:03 20:24	05:40 20:52			
10	07:46 17:04	07:22 17:42	16:13-16:50/37 16:50-16:58/8	07:39 19:17	06:46 19:53	18:53-19:18/25 20:25	06:02 20:25	05:40 20:53			
11	07:46 17:05	07:20 17:44	16:13-16:50/37 16:50-16:58/8	07:38 19:18	06:44 19:54	18:52-19:20/28 20:26	06:01 20:26	05:40 20:53			
12	07:46 17:06	07:19 17:45	16:12-16:50/38 16:50-16:58/8	07:36 19:20	06:43 19:55	18:50-19:20/30 20:27	06:00 20:27	05:40 20:54			
13	07:45 17:07	07:18 17:46	16:13-16:50/37 16:50-16:58/8	07:34 19:21	06:41 19:56	18:49-19:21/32 20:28	05:59 20:28	05:40 20:54			
14	07:45 17:08	07:16 17:48	16:13-16:50/37 16:50-16:58/8	07:32 19:22	06:39 19:57	18:49-19:22/33 20:29	05:58 20:29	05:40 20:55			
15	07:45 17:09	07:15 17:49	16:13-16:50/37 16:50-16:57/7	07:31 19:23	06:38 19:58	18:47-19:22/35 20:30	05:57 20:30	05:40 20:55			
16	07:44 17:10	07:14 17:50	16:14-16:50/36 16:50-16:57/7	07:29 19:24	06:36 19:59	18:46-19:21/35 20:31	05:56 20:31	05:40 20:56			
17	07:44 17:12	07:12 17:51	16:14-16:49/35 16:49-16:55/6	07:27 19:25	06:34 20:01	18:46-19:22/36 20:33	05:55 20:33	05:40 20:56			
18	07:43 17:13	07:11 17:53	16:15-16:48/33 16:48-16:55/7	07:26 19:27	06:33 20:01	18:46-19:21/35 20:34	05:54 20:34	05:40 20:57			
19	07:42 17:14	07:09 17:54	16:15-16:47/32 16:47-16:53/6	07:24 19:28	06:31 20:02	18:46-19:22/36 20:35	05:53 20:35	05:40 20:57			
20	07:42 17:15	07:08 17:55	16:17-16:46/29 16:46-16:50/4	07:22 19:29	06:30 20:03	06:49-06:50/1 18:45-19:21/36	05:52 20:36	05:40 20:57			
21	07:41 17:16	07:06 17:56	16:17-16:44/27 16:44-16:49/35	07:20 19:30	06:28 20:04	06:48-06:51/3 18:46-19:21/35	05:51 20:37	05:40 20:57			
22	07:41 17:18	07:05 17:58	16:20-16:43/23 16:43-16:48/33	07:19 19:31	06:27 20:05	06:46-06:51/5 18:46-19:20/34	05:50 20:38	05:41 20:58			
23	07:40 17:19	07:03 17:59	16:21-16:40/19 16:40-16:45/5	07:17 19:32	06:25 20:06	06:45-06:52/7 18:46-19:20/34	05:49 20:38	05:41 20:58			
24	07:39 17:20	07:02 18:00	16:24-16:38/14 16:38-16:43/10	07:15 19:33	06:24 20:07	06:43-06:52/9 18:46-19:19/33	05:48 20:39	05:41 20:58			
25	07:38 17:22	07:00 18:01	16:24-16:38/14 16:38-16:43/10	07:13 19:35	06:22 20:08	06:42-06:52/10 18:47-19:18/31	05:48 20:40	05:41 20:58			
26	07:37 17:23	06:59 18:03	16:29-16:37/8 16:37-16:42/7	07:12 19:36	06:21 20:10	06:41-06:52/11 18:47-19:17/30	05:47 20:41	05:42 20:58			
27	07:37 17:24	06:57 18:04	16:27-16:39/12 16:39-16:44/7	07:10 19:37	06:19 20:11	06:39-06:51/12 18:48-19:16/28	05:46 20:42	05:42 20:58			
28	07:36 17:25	06:56 18:05	16:25-16:41/16 16:41-16:46/20	07:08 19:38	06:18 20:12	06:38-06:51/13 18:50-19:15/25	05:46 20:43	05:42 20:58			
29	07:35 17:27	16:24-16:33/9 16:33-16:43/10		07:06 19:39	06:16 20:13	06:36-06:50/14 18:51-19:13/22	05:45 20:44	05:43 20:58			
30	07:34 17:28	16:23-16:37/14 16:37-16:44/7		07:05 19:40	06:15 20:14	06:35-06:50/15 18:53-19:11/18	05:44 20:45	05:43 20:58			
31	07:33 17:29	16:20-16:40/20 16:40-16:45/5		07:03 19:41			05:44 20:46				
Potential sun hours		294									
Sum of minutes with flicker		101	295	880	418	801	89	0			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

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(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110**WTG:** 10 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (122)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	July		August		September		October		November		December	
1	05:44	06:09	06:42	18:51-19:19/28	07:14	17:58-18:22/24	06:50	15:43-16:19/36	07:26			
	20:58	20:39	19:53		19:00		17:12	16:19-16:27/8	16:46			
2	05:44	06:10	06:43	18:52-19:17/25	07:15	17:59-18:21/22	06:51	15:42-16:19/37	07:27			
	20:58	20:38	19:51		18:58		17:10	16:19-16:27/8	16:46			
3	05:45	06:11	06:44	18:53-19:15/22	07:16	18:00-18:19/19	06:52	15:43-16:18/35	07:28			
	20:58	20:37	19:49		18:57		17:09	16:18-16:26/8	16:45			
4	05:45	06:12	06:45	18:55-19:13/18	07:17	18:02-18:16/14	06:54	15:44-16:18/34	07:29			
	20:58	20:35	19:48		18:55		17:08	16:18-16:26/8	16:45			
5	05:46	06:13	06:46	18:58-19:09/11	07:18	18:05-18:12/7	06:55	15:44-16:17/33	07:30			
	20:58	20:34	19:46		18:53		17:07	16:17-16:25/8	16:45			
6	05:47	06:14	06:47		07:19		06:56	15:44-16:17/33	07:31			
	20:57	20:33	19:44		18:52		17:05	16:16-16:23/7	16:45			
7	05:47	06:15	06:44-06:49/5	06:48	07:20		06:57	15:46-16:17/31	07:32			
	20:57	20:32	19:42		18:50		17:04	16:16-16:22/6	16:45			
8	05:48	06:16	06:41-06:52/11	06:49	07:21		06:59	15:47-16:16/29	07:33			
	20:57	20:31	19:41		18:48		17:03	16:15-16:20/5	16:45			
9	05:49	06:17	06:39-06:54/15	06:50	07:23		07:00	15:48-16:13/25	07:34			
	20:56	20:29	19:39		18:46		17:02	16:13-16:16/3	16:45			
10	05:49	06:18	06:40-06:55/15	06:51	07:24		07:01	15:50-16:13/23	07:35			
	20:56	20:28	19:37		18:45		17:01	16:13-16:17/4	16:45			
11	05:50	06:19	06:41-06:56/15	06:52	07:25		07:02	15:51-16:11/20	07:36			
	20:56	20:27	19:05-19:15/10	19:35	18:43		17:00	16:11-16:16/5	16:45			
12	05:51	06:20	06:42-06:57/15	06:53	07:26		07:04	15:54-16:08/14	07:37			
	20:55	20:25	19:02-19:18/16	19:34	18:41		16:59	16:08-16:15/7	16:45			
13	05:52	06:22	06:43-06:58/15	06:54	07:27		07:05	15:56-16:04/8	07:38			
	20:55	20:24	19:00-19:19/19	19:32	18:40		16:58	16:04-16:14/10	16:45			
14	05:52	06:23	06:45-06:59/14	06:55	07:28		07:06	15:57-16:13/16	07:38			
	20:54	20:22	18:58-19:21/23	19:30	18:38		16:57		16:45			
15	05:53	06:24	06:46-06:59/13	06:56	07:29		07:07	15:59-16:11/12	07:39			
	20:54	20:21	18:56-19:22/26	19:28	18:37		16:56		16:45			
16	05:54	06:25	06:47-06:59/12	06:58	07:31		07:09	16:02-16:10/8	07:40			
	20:53	20:20	18:55-19:23/28	19:27	18:35		16:55		16:46			
17	05:55	06:26	06:48-06:59/11	06:59	18:11-18:20/9	07:32	16:59-17:06/7	07:10	07:41			
	20:52	20:18	18:54-19:24/30	19:25	18:33		16:54		16:46			
18	05:56	06:27	06:49-06:59/10	07:00	18:07-18:23/16	07:33	16:55-17:10/15	07:11	07:41			
	20:52	20:17	18:53-19:24/31	19:23	18:32		16:53		16:46			
19	05:57	06:28	06:50-06:58/8	07:01	18:05-18:24/19	07:34	16:52-17:12/20	07:12	07:42			
	20:51	20:15	18:52-19:24/32	19:21	18:30		16:53		16:47			
20	05:57	06:29	06:51-06:58/7	07:02	18:03-18:25/22	07:35	16:49-17:14/25	07:14	07:42			
	20:50	20:14	18:52-19:26/34	19:20	18:29		16:52		16:47			
21	05:58	06:30	06:52-06:57/5	07:03	18:01-18:26/25	07:36	16:48-17:15/27	07:15	07:43			
	20:49	20:12	18:51-19:26/35	19:18	18:27		16:51		16:47			
22	05:59	06:31	06:53-06:56/3	07:04	18:00-18:27/27	07:38	16:47-17:17/30	07:16	07:44			
	20:49	20:11	18:51-19:26/35	19:16	18:26		17:17-17:22/5	16:50	16:48			
23	06:00	06:32	06:54-06:55/1	07:05	17:59-18:27/28	07:39	16:45-17:18/33	07:17	07:44			
	20:48	20:09	18:50-19:26/36	19:14	18:24		17:18-17:24/6	16:50	16:48			
24	06:01	06:33	18:50-19:26/36	07:06	17:58-18:27/29	07:40	16:44-17:18/34	07:18	07:44			
	20:47	20:07		19:12	18:23		17:18-17:25/7	16:49	16:49			
25	06:02	06:34	18:50-19:25/35	07:07	17:57-18:26/29	07:41	16:44-17:19/35	07:20	07:45			
	20:46	20:06		19:11	18:21		17:19-17:25/6	16:49	16:50			
26	06:03	06:35	18:49-19:25/36	07:08	17:57-18:26/29	07:42	16:43-17:19/36	07:21	07:45			
	20:45	20:04		19:09	18:20		17:19-17:27/8	16:48	16:50			
27	06:04	06:36	18:49-19:24/35	07:09	17:57-18:25/28	07:44	16:43-17:19/36	07:22	07:46			
	20:44	20:03		19:07	18:18		17:19-17:27/8	16:48	16:51			
28	06:05	06:37	18:49-19:23/34	07:10	17:57-18:26/29	07:45	16:42-17:19/37	07:23	07:46			
	20:43	20:01		19:05	18:17		17:19-17:27/8	16:47	16:52			
29	06:06	06:38	18:49-19:23/34	07:11	17:57-18:25/28	07:46	16:42-17:20/38	07:24	07:46			
	20:42	19:58		19:04	18:16		17:20-17:28/8	16:47	16:52			
30	06:07	06:40	18:50-19:22/32	07:13	17:58-18:24/26	07:47	16:42-17:19/37	07:25	07:46			
	20:41	19:56		19:02	18:14		17:19-17:27/8	16:46	16:53			
31	06:08	06:41	18:50-19:20/30			07:49	16:42-17:19/37		07:47			
	20:40	19:54			18:13		17:19-17:27/8		16:54			
Potential sun hours	463	431	375		343		294		283			
Sum of minutes with flicker	0	802	448		605		478		0			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

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Licensed user:

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US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110WTG: 11 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (137)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

		[January]	[February]	[March]	[April]	[May]	[June]	[July]	[August]	[September]	[October]	[November]	[December]		
1	07:47	08:10-08:37/27	07:32	06:54	07:01	06:14	05:43	05:44	06:09	06:42	07:14	06:50	07:26	07:55-08:22/27	
	16:55		17:31	18:06	19:42	20:15	20:46	20:58	20:39	19:53	19:00	17:12	16:46		
2	07:47	08:10-08:37/27	07:31	06:52	06:59	06:12	05:43	05:44	06:10	06:43	07:15	06:51	07:27	07:55-08:23/28	
	16:56		17:32	18:08	19:44	20:16	20:47	20:58	20:38	19:51	18:58	17:10	16:46		
3	07:47	08:10-08:38/28	07:30	06:51	06:58	06:11	05:42	05:45	06:11	06:44	07:16	06:52	07:28	07:56-08:24/28	
	16:57		17:33	18:09	19:45	20:17	20:48	20:58	20:37	19:49	18:57	17:09	16:45		
4	07:47	08:10-08:38/28	07:29	06:49	06:56	06:10	05:42	05:45	06:12	06:45	07:17	06:54	07:29	07:56-08:25/29	
	16:58		17:34	18:10	19:46	20:18	20:49	20:58	20:35	19:48	18:55	17:08	16:45		
5	07:47	08:10-08:39/29	07:28	06:48	06:54	06:08	05:42	05:46	06:13	06:46	07:18	06:55	07:30	07:57-08:25/28	
	16:59		17:36	18:11	19:47	20:20	20:49	20:58	20:34	19:46	18:53	17:07	16:45		
6	07:47	08:11-08:39/28	07:26	06:46	06:53	06:07	05:41	05:47	06:14	06:47	07:19	06:56	07:31	07:57-08:25/28	
	17:00		17:37	18:12	19:48	20:21	20:50	20:57	20:33	19:44	18:51	17:05	16:45		
7	07:47	08:11-08:39/28	07:25	06:44	06:51	06:06	05:41	05:47	06:15	06:48	07:20	06:57	07:32	07:57-08:26/29	
	17:01		17:38	18:14	19:49	20:22	20:51	20:57	20:32	19:42	18:50	17:04	16:45		
8	07:47	08:11-08:40/29	07:24	07:43	06:49	06:04	05:41	05:48	06:16	06:49	07:21	06:59	07:33	07:58-08:26/28	
	17:02		17:40	19:15	19:50	20:23	20:51	20:57	20:30	19:41	18:48	17:03	16:45		
9	07:46	08:12-08:40/28	07:23	07:41	06:48	06:03	05:40	05:49	06:17	06:50	07:22	07:00	07:34	07:58-08:26/28	
	17:03		17:41	19:16	19:51	20:24	20:52	20:56	20:29	19:39	18:46	17:02	16:45		
10	07:46	08:13-08:41/28	07:22	07:39	06:46	06:02	05:40	05:49	06:18	06:51	07:24	07:01	07:35	07:59-08:26/27	
	17:04		17:42	19:17	19:53	20:25	20:53	20:56	20:28	19:37	18:45	17:01	16:45		
11	07:46	08:13-08:40/27	07:20	07:37	06:44	06:01	05:40	05:50	06:19	06:52	07:25	07:02	07:36	08:00-08:27/27	
	17:05		17:44	19:18	19:54	20:26	20:53	20:56	20:27	19:35	18:43	17:00	16:45		
12	07:46	08:14-08:41/27	07:19	07:36	06:43	06:00	05:40	05:51	06:20	06:53	07:26	07:04	07:37	08:01-08:27/26	
	17:06		17:45	19:20	19:55	20:27	20:54	20:55	20:25	19:34	18:41	16:59	16:45		
13	07:45	08:14-08:41/27	07:18	07:34	06:41	05:59	05:40	05:52	06:21	06:54	07:27	07:05	07:38	08:02-08:28/26	
	17:07		17:46	19:21	19:56	20:28	20:54	20:55	20:24	19:32	18:40	16:58	16:45		
14	07:45	08:15-08:41/26	07:16	07:32	06:39	05:58	05:40	05:52	06:23	06:55	07:28	07:06	07:38	08:03-08:29/26	
	17:08		17:48	19:22	19:57	20:29	20:55	20:54	20:22	19:30	18:38	16:57	16:45		
15	07:44	08:16-08:42/26	07:15	07:31	06:38	05:57	05:40	05:53	06:24	06:56	07:29	07:07	07:39	08:03-08:28/25	
	17:09		17:49	19:23	19:58	20:30	20:55	20:53	20:21	19:28	18:37	16:56	16:45		
16	07:44	08:16-08:41/25	07:14	07:29	06:36	05:56	05:40	05:54	06:25	06:57	07:31	07:09	07:40	08:04-08:29/25	
	17:10		17:50	19:24	19:59	20:31	20:56	20:53	20:19	19:27	18:35	16:55	16:46		
17	07:43	08:17-08:41/24	07:12	07:27	06:34	05:55	05:40	05:55	06:26	06:59	07:32	07:10	07:41	08:05-08:30/25	
	17:12		17:51	19:25	20:00	20:32	20:56	20:52	20:18	19:25	18:33	16:54	16:46		
18	07:43	08:18-08:41/23	07:11	07:25	06:33	05:54	05:40	05:56	06:27	07:00	07:33	07:11	07:41	08:05-08:30/25	
	17:13		17:53	19:27	20:00	20:33	20:57	20:52	20:17	19:23	18:32	16:53	16:46		
19	07:42	08:19-08:40/21	07:09	07:24	06:31	05:53	05:40	05:57	06:28	07:01	07:34	07:12	08:00-08:11/11	07:42	08:06-08:30/24
	17:14		17:54	19:28	20:02	20:34	20:57	20:51	20:15	19:21	18:30	16:53	16:47		
20	07:42	08:20-08:39/19	07:08	07:22	06:30	05:52	05:40	05:57	06:29	07:02	07:35	07:13	07:58-08:13/15	07:42	08:06-08:30/24
	17:15		17:55	19:29	20:03	20:35	20:57	20:50	20:14	19:19	18:29	16:52	16:47		
21	07:41	08:22-08:39/17	07:06	07:20	06:28	05:51	05:40	05:58	06:30	07:03	07:36	07:15	07:57-08:14/17	07:43	08:07-08:31/24
	17:16		17:56	19:30	20:04	20:36	20:57	20:49	20:12	19:18	18:27	16:51	16:47		
22	07:40	08:23-08:38/15	07:05	07:19	06:27	05:50	05:41	05:59	06:31	07:04	07:38	07:16	07:57-08:16/19	07:43	08:07-08:31/24
	17:18		17:58	19:31	20:05	20:37	20:58	20:49	20:10	19:16	18:26	16:50	16:48		
23	07:40	08:25-08:36/11	07:03	07:17	06:25	05:49	05:41	06:00	06:32	07:05	07:39	07:17	07:56-08:17/21	07:44	08:08-08:32/24
	17:19		17:59	19:32	20:06	20:38	20:58	20:48	20:09	19:14	18:24	16:50	16:48		
24	07:39		07:02	07:15	06:24	05:48	05:41	06:01	06:33	07:06	07:40	07:18	07:55-08:18/23	07:44	08:08-08:32/24
	17:20		18:00	19:33	20:07	20:39	20:58	20:47	20:07	19:12	18:23	16:49	16:49		
25	07:38		07:00	07:13	06:22	05:48	05:41	06:02	06:34	07:07	07:41	07:19	07:55-08:19/24	07:45	08:09-08:33/24
	17:22		18:01	19:35	20:08	20:40	20:58	20:46	20:06	19:11	18:21	16:49	16:50		
26	07:37		06:59	07:12	06:21	05:47	05:42	06:03	06:35	07:08	07:42	07:21	07:54-08:19/25	07:45	08:09-08:34/25
	17:23		18:03	19:36	20:09	20:41	20:58	20:45	20:04	19:09	18:20	16:48	16:50		
27	07:37		06:57	07:10	06:19	05:46	05:42	06:04	06:36	07:09	07:44	07:22	07:55-08:21/26	07:46	08:09-08:34/25
	17:24		18:04	19:37	20:11	20:42	20:58	20:44	20:03	19:07	18:18	16:48	16:51		
28	07:36		06:56	07:08	06:18	05:46	05:42	06:05	06:37	07:10	07:45	07:23	07:55-08:21/26	07:46	08:09-08:34/25
	17:25		18:05	19:38	20:12	20:43	20:58	20:43	20:01	19:05	18:17	16:47	16:52		
29	07:35			07:06	06:16	05:45	05:43	06:06	06:38	07:11	07:46	07:24	07:55-08:22/27	07:46	08:10-08:35/25
	17:27			19:39	20:13	20:44	20:58	20:42	19:58	19:04	18:16	16:47	16:52		
30	07:34			07:05	06:15	05:44	05:43	06:07	06:40	07:12	07:47	07:25	07:55-08:22/27	07:46	08:10-08:36/26
	17:28			19:40	20:14	20:45	20:58	20:41	19:56	19:02	18:14	16:46	16:53		
31	07:33			07:03		05:44		06:08	06:41		07:49		07:47	08:10-08:36/26	
	17:29			19:41		20:46		20:40	19:54		18:13		16:54		
Potential sun hours	294		295	370	401	452	457	463	431	375	343	294	261	283	
Sum of minutes with flicker	568	0	0	0	0	0	0	0	0	0	0	0	0	805	

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 11:06 AM / 4

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110WTG: 12 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (138)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
--	---------	----------	-------	-------	-----	------	------	--------	-----------	---------	----------	----------

1	07:47	07:32	06:54	07:01	06:14	05:43	05:44	06:09	06:42	07:14	06:50	07:26
	16:55	17:31	18:06	19:42	20:15	20:46	20:58	20:39	19:53	19:00	17:12	16:46
2	07:47	07:31	06:52	06:59	06:12	05:43	05:44	06:10	06:43	07:15	06:51	07:27
	16:56	17:32	18:08	19:44	20:16	20:47	20:58	20:38	19:51	18:58	17:10	16:46
3	07:47	07:30	06:51	06:58	06:11	05:42	05:45	06:11	06:44	07:16	06:52	07:28
	16:57	17:33	18:09	19:45	20:17	20:48	20:58	20:37	19:49	18:57	17:09	16:45
4	07:47	07:29	06:49	06:56	06:10	05:42	05:45	06:12	06:45	07:17	06:54	07:29
	16:58	17:34	18:10	19:46	20:18	20:49	20:58	20:35	19:48	18:55	17:08	16:45
5	07:47	07:28	06:48	06:54	06:08	05:42	05:46	06:13	06:46	07:18	06:55	07:30
	16:59	17:36	18:11	19:47	20:20	20:49	20:58	20:34	19:46	18:53	17:07	16:45
6	07:47	07:26	06:46	06:53	06:07	05:41	05:47	06:14	06:47	07:19	06:56	07:31
	17:00	17:37	18:12	19:48	20:21	20:50	20:57	20:33	19:44	18:52	17:05	16:45
7	07:47	07:25	06:44	06:51	06:06	05:41	05:47	06:15	06:48	07:20	06:57	07:32
	17:01	17:38	18:14	19:49	20:22	20:51	20:57	20:32	19:42	18:50	17:04	16:45
8	07:47	07:24	07:43	06:49	06:05	05:41	05:48	06:16	06:49	07:21	06:59	07:33
	17:02	17:40	19:15	19:50	20:23	20:51	20:57	20:30	19:41	18:48	17:03	16:45
9	07:46	07:23	07:41	06:48	06:03	05:40	05:49	06:17	06:50	07:23	07:00	07:34
	17:03	17:41	19:16	19:51	20:24	20:52	20:56	20:29	19:39	18:46	17:02	16:45
10	07:46	07:22	07:39	06:46	06:02	05:40	05:49	06:18	06:51	07:24	07:01	07:35
	17:04	17:42	19:17	19:53	20:25	20:53	20:56	20:28	19:37	18:45	17:01	16:45
11	07:46	07:20	07:37	06:44	06:01	05:40	05:50	06:19	06:52	07:25	07:02	07:36
	17:05	17:44	19:18	19:54	20:26	20:53	20:56	20:27	19:35	18:43	17:00	16:45
12	07:46	07:19	07:36	06:43	06:00	05:40	05:51	06:20	06:53	07:26	07:04	07:37
	17:06	17:45	19:20	19:55	20:27	20:54	20:55	20:25	19:34	18:41	16:59	16:45
13	07:45	07:18	07:34	06:41	05:59	05:40	05:52	06:22	06:54	07:27	07:05	07:38
	17:07	17:46	19:21	19:56	20:28	20:54	20:55	20:24	19:32	18:40	16:58	16:45
14	07:45	07:16	07:32	06:39	05:58	05:40	05:52	06:23	06:55	07:28	07:06	07:38
	17:08	17:48	19:22	19:57	20:29	20:55	20:54	20:22	19:30	18:38	16:57	16:45
15	07:44	07:15	07:31	06:38	05:57	05:40	05:53	06:24	06:56	07:29	07:07	07:39
	17:09	17:49	19:23	19:58	20:30	20:55	20:54	20:21	19:28	18:37	16:56	16:45
16	07:44	07:14	07:29	06:36	05:56	05:40	05:54	06:25	06:57	07:31	07:09	07:40
	17:10	17:50	19:24	19:59	20:31	20:56	20:53	20:20	19:27	18:35	16:55	16:46
17	07:44	07:12	07:27	06:34	05:55	05:40	05:55	06:26	06:59	07:32	07:10	07:41
	17:12	17:51	19:25	20:01	20:32	20:56	20:52	20:18	19:25	18:33	16:54	16:46
18	07:43	07:11	07:25	06:33	05:54	05:40	05:56	06:27	07:00	07:33	07:11	07:41
	17:13	17:53	19:27	20:01	20:33	20:57	20:52	20:17	19:23	18:32	16:53	16:46
19	07:42	07:09	07:24	06:31	05:53	05:40	05:57	06:28	07:01	07:34	07:12	07:42
	17:14	17:54	19:28	20:02	20:34	20:57	20:51	20:15	19:21	18:30	16:53	16:47
20	07:42	07:08	07:22	06:30	05:52	05:40	05:57	06:29	07:02	07:35	07:13	07:42
	17:15	17:55	19:29	20:03	20:35	20:57	20:50	20:14	19:19	18:29	16:52	16:47
21	07:41	07:06	07:20	06:28	05:51	05:40	05:58	06:30	07:03	07:36	07:15	07:43
	17:16	17:56	19:30	20:04	20:36	20:57	20:49	20:12	19:18	18:27	16:51	16:47
22	07:40	07:05	07:19	06:27	05:50	05:41	05:59	06:31	07:04	07:38	07:16	07:44
	17:18	17:58	19:31	20:05	20:37	20:58	20:49	20:10	19:16	18:26	16:50	16:48
23	07:40	07:03	07:17	06:25	05:49	05:41	06:00	06:32	07:05	07:39	07:17	07:44
	17:19	17:59	19:32	20:06	20:38	20:58	20:48	20:09	19:14	18:24	16:50	16:48
24	07:39	07:02	07:15	06:24	05:48	05:41	06:01	06:33	07:06	07:40	07:18	07:44
	17:20	18:00	19:33	20:07	20:39	20:58	20:47	20:07	19:12	18:23	16:49	16:49
25	07:38	07:00	07:13	06:22	05:48	05:41	06:02	06:34	07:07	07:41	07:19	07:45
	17:22	18:01	19:35	20:08	20:40	20:58	20:46	20:06	19:11	18:21	16:49	16:50
26	07:37	06:59	07:12	06:21	05:47	05:42	06:03	06:35	07:08	07:42	07:21	07:45
	17:23	18:03	19:36	20:10	20:41	20:58	20:45	20:04	19:09	18:20	16:48	16:50
27	07:37	06:57	07:10	06:19	05:46	05:42	06:04	06:36	07:09	07:44	07:22	07:46
	17:24	18:04	19:37	20:11	20:42	20:58	20:44	20:03	19:07	18:18	16:48	16:51
28	07:36	06:56	07:08	06:18	05:46	05:42	06:05	06:37	07:10	07:45	07:23	07:46
	17:25	18:05	19:38	20:12	20:43	20:58	20:43	20:01	19:05	18:17	16:47	16:52
29	07:35		07:06	06:16	05:45	05:43	06:06	06:38	07:11	07:46	07:24	07:46
	17:27		19:39	20:13	20:44	20:58	20:42	19:58	19:04	18:16	16:47	16:52
30	07:34		07:05	06:15	05:44	05:43	06:07	06:40	07:13	07:47	07:25	07:46
	17:28		19:40	20:14	20:45	20:58	20:41	19:56	19:02	18:14	16:46	16:53
31	07:33		07:03		05:44		06:08	06:41		07:49		07:47
	17:29		19:41		20:46		20:40	19:54		18:13		16:54
Potential sun hours	294	295	370	401	452	457	463	431	375	343	294	283
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 11:06 AM / 5

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110**WTG:** 15 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (124)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December						
1	07:47	07:32	06:54	07:14-07:38/24	07:01	07:25-07:56/31	06:14	05:43	05:44	06:09	06:42	07:31-07:41/10	07:14	07:50-08:11/21	06:50	07:26		
	16:55	17:31	18:06	16:52-17:00/8	19:43	17:31-18:32/61	20:15	20:46	20:58	20:39	19:53	17:37-18:22/45	19:00	17:27-18:06/39	17:12	16:46		
2	07:47	07:31	06:52	07:12-07:38/26	06:59	07:24-07:55/31	06:12	05:43	05:44	06:10	06:43	07:28-07:44/16	07:15	07:48-08:12/24	06:51	07:27		
	16:56	17:32	18:08	16:52-17:00/8	19:44	17:32-18:33/61	20:16	20:47	20:58	20:38	19:51	17:35-18:23/48	18:58	17:29-18:04/35	17:10	16:46		
3	07:47	07:30	06:51	07:11-07:39/28	06:58	07:24-07:54/30	06:11	05:42	05:45	06:11	06:44	07:25-07:45/20	07:16	07:47-08:13/26	06:52	07:28		
	16:57	17:33	18:09	16:57-17:05/10	19:45	17:32-18:32/60	20:17	20:48	20:58	20:37	19:49	17:34-18:24/50	18:57	17:31-18:01/30	17:09	16:45		
4	07:47	07:29	06:49	07:09-07:39/30	06:56	07:24-07:53/29	06:10	05:42	05:45	06:12	06:45	07:23-07:46/23	07:17	07:45-08:14/29	06:54	07:29		
	16:58	17:35	18:10	16:58-17:06/10	19:46	17:32-18:31/59	20:19	20:49	20:58	20:35	19:48	17:32-18:24/52	18:55	17:34-17:57/23	17:08	16:45		
5	07:47	07:28	06:48	07:08-07:39/31	06:54	07:25-07:53/28	06:08	05:42	05:46	06:13	06:46	07:22-07:47/25	07:18	07:44-08:14/30	06:55	07:30		
	16:59	17:36	18:11	16:59-17:07/11	19:47	17:33-18:30/57	20:20	20:49	20:58	20:34	19:46	17:31-18:25/54	18:53	17:39-17:51/12	17:07	16:45		
6	07:47	07:26	06:46	07:08-07:39/31	06:53	07:25-07:52/27	06:07	05:41	05:47	06:14	06:47	07:21-07:48/27	07:19	07:45-08:15/30	06:56	07:31		
	17:00	17:37	18:12	16:59-17:07/11	19:48	17:33-18:29/56	20:21	20:50	20:57	20:33	19:44	17:30-18:25/55	18:52	17:45-08:15/30	17:05	16:45		
7	07:47	07:25	06:44	07:08-07:38/30	06:51	07:25-07:50/25	06:06	05:41	05:47	06:15	06:48	07:20-07:48/28	07:20	07:44-08:15/31	06:57	07:32		
	17:01	17:38	18:14	16:59-17:07/11	19:49	17:34-18:28/54	20:22	20:51	20:57	20:32	19:42	17:28-18:25/57	18:50	17:45-08:15/31	17:04	16:45		
8	07:47	07:24	07:43	08:07-08:37/30	06:49	07:26-07:49/23	06:05	05:41	05:48	06:16	06:49	07:19-07:48/29	07:21	07:43-08:14/31	06:59	07:33		
	17:02	17:40	19:15	16:59-17:07/11	19:50	17:35-18:27/52	20:23	20:52	20:57	20:31	19:41	17:27-18:26/59	18:48	17:45-08:15/31	17:03	16:45		
9	07:46	07:23	07:41	08:08-08:37/29	06:48	07:27-07:47/20	06:03	05:41	05:49	06:17	06:50	07:18-07:48/30	07:23	07:43-08:14/31	07:00	07:34		
	17:03	17:41	19:16	17:58-18:17/19	19:52	17:36-18:26/50	20:24	20:52	20:56	20:29	19:39	17:26-18:26/60	18:46	17:45-08:15/31	17:02	16:45		
10	07:46	07:22	07:39	08:09-08:36/27	06:46	07:29-07:45/16	06:02	05:40	05:49	06:18	06:51	07:17-07:48/31	07:24	07:44-08:13/29	07:01	07:35		
	17:04	17:42	19:17	17:54-18:22/28	19:53	17:36-18:24/48	20:25	20:53	20:56	20:28	19:37	17:25-18:26/61	18:45	17:45-08:15/31	17:01	16:45		
11	07:46	07:20	07:38	08:09-08:34/25	06:44	07:32-07:42/10	06:01	05:40	05:50	06:19	06:52	07:17-07:48/31	07:25	07:45-08:12/27	07:02	07:36		
	17:05	17:44	19:18	17:51-18:24/33	19:54	17:38-18:23/45	20:26	20:53	20:56	20:27	19:35	17:24-18:26/62	18:43	17:45-08:15/31	17:00	16:45		
12	07:46	07:19	07:36	08:10-08:33/23	06:43	07:39-18:21/42	06:00	05:40	05:51	06:20	06:53	07:17-07:47/30	07:26	07:46-08:12/26	07:04	07:37		
	17:06	17:45	19:20	17:48-18:26/38	19:55	17:39-18:21/42	20:27	20:54	20:55	20:25	19:34	17:24-18:25/61	18:41	17:45-08:15/31	16:59	16:45		
13	07:45	07:18	07:34	08:12-08:31/19	06:41	17:40-18:19/39	05:59	05:40	05:52	06:22	06:54	07:17-07:47/30	07:27	07:48-08:11/23	07:05	07:38		
	17:07	17:46	19:21	17:47-18:28/41	19:56	17:40-18:19/39	20:28	20:54	20:55	20:24	19:32	17:23-18:25/62	18:40	17:24-17:35/11	16:58	16:45		
14	07:45	07:16	07:32	08:14-08:28/14	06:39	17:42-18:18/36	05:58	05:40	05:52	06:23	06:55	07:17-07:46/29	07:28	07:49-08:10/21	07:06	07:38		
	17:08	17:48	19:22	17:44-18:29/45	19:57	17:42-18:18/36	20:29	20:55	20:54	20:22	19:30	17:22-18:25/63	18:38	17:21-17:37/16	16:57	16:45		
15	07:45	07:15	07:31	08:17-08:24/7	06:38	17:44-18:15/31	05:57	05:40	05:53	06:24	06:56	07:17-07:45/28	07:29	07:50-08:08/18	07:07	07:39		
	17:09	17:49	19:23	17:42-18:30/48	19:58	17:44-18:15/31	20:30	20:55	20:54	20:21	19:28	17:22-18:25/63	18:37	17:19-17:38/19	16:56	16:45		
16	07:44	07:14	07:31	16:46-17:09/23	07:29	17:41-18:31/50	06:36	17:47-18:13/26	05:56	05:40	05:54	06:25	06:58	07:18-07:44/26	07:31	07:51-08:06/15	07:09	07:40
	17:10	17:50	19:24	16:46-17:09/23	19:24	17:41-18:31/50	20:31	20:56	20:53	20:20	19:27	17:21-18:24/63	18:35	17:18-17:39/21	16:55	16:46		
17	07:44	07:12	07:27	16:45-17:09/24	07:27	17:40-18:33/53	06:34	17:50-18:09/19	05:55	05:40	05:55	06:26	06:59	07:19-07:42/23	07:32	07:53-08:05/12	07:10	07:41
	17:12	17:51	19:25	16:45-17:09/24	19:25	17:40-18:33/53	20:32	20:56	20:52	20:18	19:25	17:21-18:23/62	18:33	17:16-17:40/24	16:54	16:46		
18	07:43	07:11	07:26	16:45-17:10/25	07:26	17:38-18:33/55	06:33	17:54-18:03/9	05:54	05:40	05:56	06:27	07:00	07:20-07:40/20	07:33	07:54-08:01/7	07:11	07:41
	17:13	17:53	19:27	16:45-17:10/25	19:27	17:38-18:33/55	20:34	20:57	20:52	20:17	19:23	17:20-18:23/63	18:32	17:16-17:41/25	16:53	16:46		
19	07:42	07:09	07:24	16:44-17:10/26	07:24	17:37-18:34/57	06:31	17:54-18:03/9	05:53	05:40	05:57	06:28	07:01	07:21-07:38/17	07:34	17:15-17:41/26	07:12	07:42
	17:14	17:54	19:28	16:44-17:10/26	19:28	17:37-18:34/57	20:35	20:57	20:51	20:15	19:21	17:20-18:22/62	18:30	17:15-17:41/26	16:53	16:47		
20	07:42	07:08	07:22	16:44-17:10/26	07:22	17:36-18:34/58	06:30	17:54-18:03/9	05:52	05:40	05:57	06:29	07:02	07:23-07:34/11	07:35	17:15-17:41/26	07:14	07:42
	17:15	17:55	19:29	16:44-17:10/26	19:29	17:36-18:34/58	20:36	20:57	20:50	20:14	19:20	17:20-18:21/61	18:29	17:15-17:41/26	16:52	16:47		
21	07:41	07:06	07:20	16:43-17:10/27	07:20	17:36-18:35/59	06:28	17:54-18:03/9	05:51	05:40	05:58	06:30	07:03	07:20-18:20/60	07:36	17:14-17:40/26	07:15	07:43
	17:17	17:56	19:30	16:43-17:10/27	19:30	17:36-18:35/59	20:37	20:57	20:49	20:12	19:18	17:20-18:20/60	18:27	17:14-17:40/26	16:51	16:47		
22	07:41	07:05	07:19	16:44-17:10/26	07:19	17:35-18:35/60	06:27	17:54-18:03/9	05:50	05:41	05:59	06:31	07:04	07:20-18:20/60	07:38	17:15-17:41/26	07:16	07:44
	17:18	17:58	19:31	16:44-17:10/26	19:31	17:35-18:35/60	20:37	20:58	20:49	20:11	19:16	17:20-18:20/60	18:26	17:15-17:41/26	16:50	16:48		
23	07:40	07:03	07:17	16:44-17:09/25	07:17	07:38-07:47/9	06:25	17:54-18:03/9	05:49	05:41	06:00	06:32	07:05	07:20-18:18/58	07:39	17:14-17:40/26	07:17	07:44
	17:19	17:59	19:32	16:44-17:09/25	19:32	17:34-18:35/61	20:38	20:58	20:48	20:09	19:14	17:20-18:18/58	18:24	17:14-17:40/26	16:50	16:48		
24	07:39	07:02	07:16	16:45-17:09/24	07:15	07:34-07:50/16	06:24	17:54-18:03/9	05:48	05:41	06:01	06:33	07:06	07:20-18:17/57	07:40	17:14-17:39/25	07:18	07:44
	17:20	18:00	18:45	16:45-17:09/24	19:33	17:33-18:35/62	20:07	17:54-18:03/9	20:39	20:58	20:47	20:07	19:12	17:20-18:17/57	18:23	17:14-17:39/25	16:49	16:49
25	07:38	07:00	07:14	16:45-17:08/23	07:13	07:33-07:52/19	06:22	17:54-18:03/9	05:48	05:41	06:02	06:34	07:07	07:21-18:16/55	07:41	17:15-17:38/23	07:20	07:45
	17:22	18:01	18:45	16:45-17:08/23	19:35	17:33-18:35/62	20:08	17:54-18:03/9	20:40	20:58	20:46	20:06	19:11	17:21-18:16/55	18:21	17:15-17:38/23	16:49	16:50
26	07:37	06:59	07:13	16:46-17:07/21	07:12	07:31-07:53/22	06:21	17:54-18:03/9	05:47	05:42	06:03	06:35	07:08	07:21-18:15/54	07:42	17:16-17:38/22	07:21	07:45
	17:23	18:03	18:46	16:46-17:07/21	19:36	17:32-18:35/63	20:10	17:54-18:03/9	20:41	20:58	20:45	20:04	19:09	17:21-18:15/54	18:20	17:16-17:38/22	16:48	16:50
27	07:37	06:57	07:17	07:36/19	07:10	07:29-07:54/25	06:19	17:54-18:03/9	05:46	05:42	06:04	06:36	07:09	07:23-18:14/51	07:44	17:17-17:37/20	07:22	07:46
	17:24	18:04	18:47	16:47-07/15	19:37	17:32-18:35/63	20:11	17:54-18:03/9	20:42	20:58	20:44	20:03	19:07	07:23-18:14/51	18:18	17:17-17:37/20	16:48	16:51
28	07:36	06:56	07:16	07:38/22	07:08	07:27-07:54/27	06:18	17:54-18:03/9	05:46	05:42	06:04	06:37	07:10	07:23-18:12/49	07:45	17:18-17:35/17	07:23	07:46
	17:25	18:05	18:49	16:49-07/13	19:38	17:31-18:34/63	20:12	17:54-18:03/9	20:43	20:58	20:43	20:03	19:05	07:23-18:12/49	18:17	17:18-17:35/17	16:47	16:50

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 11:06 AM / 6

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110WTG: 16 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (128)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

January			February			March			April			May			June		
1	07:47	07:32	06:54						07:01	07:23-07:41/18	06:14	06:40-06:48/8			05:43	06:18-06:58/40	
	16:55	17:31	18:06						19:43	07:41-07:50/9	20:15	19:14-19:38/24			20:46	19:09-19:46/37	
2	07:47	07:31	06:52						06:59	07:20-07:44/24	06:12	06:36-06:50/14			05:43	06:17-06:58/41	
	16:56	17:32	18:08						19:44	07:44-07:47/3	20:16	19:12-19:39/27			20:47	19:09-19:45/36	
3	07:47	07:30	06:51						06:58	07:17-07:44/27	06:11	06:35-06:52/17			05:42	06:18-06:58/40	
	16:57	17:33	18:09						19:45		20:17	19:11-19:41/30			20:48	19:10-19:45/35	
4	07:47	07:29	06:49						06:56	07:15-07:45/30	06:10	06:34-06:53/19			05:42	06:17-06:58/41	
	16:58	17:35	18:10						19:46		20:19	19:10-19:42/32			20:49	19:10-19:44/34	
5	07:47	07:28	06:48						06:54	07:14-07:47/33	06:08	06:33-06:54/21			05:42	06:18-06:58/40	
	16:59	17:36	18:11						19:47		20:20	19:09-19:43/34			20:50	19:11-19:44/33	
6	07:47	07:26	06:46						06:53	07:12-07:48/36	06:07	06:31-06:54/23			05:41	06:18-06:58/40	
	17:00	17:37	18:12						19:48		20:21	19:07-19:43/36			20:50	19:12-19:44/32	
7	07:47	07:25	06:44						06:51	07:11-07:48/37	06:06	06:31-06:55/24			05:41	06:19-06:59/40	
	17:01	17:38	18:14						19:49		20:22	19:06-19:44/38			20:51	19:13-19:45/32	
8	07:47	07:24	07:43						06:49	07:10-07:49/39	06:05	06:31-06:55/24			05:41	06:18-06:58/40	
	17:02	17:40	19:15						19:50		20:23	19:06-19:45/39			20:52	19:12-19:44/32	
9	07:46	07:23	07:41						06:48	07:09-07:49/40	06:03	06:30-06:55/25			05:41	06:19-06:58/39	
	17:03	17:41	19:16						19:52		20:24	19:05-19:45/40			20:52	19:13-19:44/31	
10	07:46	07:22	07:39						06:46	07:08-07:49/41	06:02	06:28-06:56/28			05:40	06:19-06:59/40	
	17:04	17:42	19:17						19:53		20:25	19:05-19:46/41			20:53	19:14-19:44/30	
11	07:46	07:20	07:38						06:44	07:08-07:50/42	06:01	06:26-06:56/30			05:40	06:20-06:59/39	
	17:05	17:44	19:18						19:54		20:26	19:05-19:46/41			20:53	19:14-19:44/30	
12	07:46	07:19	07:36						06:43	07:07-07:49/42	06:00	06:24-06:56/32			05:40	06:20-06:59/39	
	17:06	17:45	19:20						19:55		20:27	19:05-19:47/42			20:54	19:15-19:44/29	
13	07:45	07:18	07:34						06:41	07:06-07:49/43	05:59	06:23-06:56/33			05:40	06:20-06:59/39	
	17:07	17:46	19:21						19:56		20:28	19:04-19:47/43			20:54	19:16-19:44/28	
14	07:45	07:16	07:32						06:39	07:06-07:49/43	05:58	06:22-06:55/33			05:40	06:21-07:00/39	
	17:08	17:48	19:22						19:57		20:29	19:04-19:47/43			20:55	19:16-19:44/28	
15	07:45	07:15	07:31						06:38	07:06-07:49/43	05:57	06:21-06:55/34			05:40	06:21-07:00/39	
	17:09	17:49	19:23						19:58		20:30	19:04-19:47/43			20:55	19:17-19:44/27	
16	07:44	07:14	07:29						06:36	07:06-07:49/43	05:56	06:20-06:55/35			05:40	06:21-07:00/39	
	17:10	17:50	19:24						19:59		20:31	19:04-19:47/43			20:56	19:17-19:44/27	
17	07:44	07:12	07:27						06:34	07:05-07:48/43	05:55	06:20-06:54/34			05:40	06:21-07:00/39	
	17:12	17:51	19:25						20:01		20:33	19:04-19:47/43			20:56	19:17-19:43/26	
18	07:43	07:11	07:26	07:45-07:52/7					06:33	07:05-07:47/42	05:54	06:19-06:54/35			05:40	06:21-07:00/39	
	17:13	17:53	19:27						20:01		20:34	19:04-19:47/43			20:57	19:17-19:43/26	
19	07:42	07:09	07:24	07:43-07:54/11					06:31	07:06-07:46/40	05:53	06:18-06:54/36			05:40	06:22-07:00/38	
	17:14	17:54	19:28						20:02		20:35	19:04-19:47/43			20:57	19:18-19:43/25	
20	07:42	07:08	07:22	07:42-07:56/14					06:30	07:06-07:45/39	05:52	06:18-06:53/35	19:04-19:47/43		05:40	06:22-07:00/38	
	17:15	17:55	19:29						20:03		20:36	06:53-06:55/2			20:57	19:18-19:43/25	
21	07:41	07:06	07:20	07:40-07:57/17					06:28	07:07-07:45/38	05:51	06:17-06:52/35	19:04-19:47/43		05:40	06:22-07:00/38	
	17:17	17:57	19:30						20:04		20:37	06:52-06:55/3			20:58	19:18-19:43/25	
22	07:41	07:05	07:19	07:38-07:57/19					06:27	07:07-07:43/36	05:50	06:18-06:52/34	19:05-19:47/42		05:41	06:23-07:01/38	
	17:18	17:58	19:31						20:05		20:38	06:52-06:56/4			20:58	19:19-19:44/25	
23	07:40	07:03	07:17	07:36-07:57/21					06:25	07:08-07:43/35	05:49	06:17-06:50/33	19:05-19:47/42		05:41	06:23-07:01/38	
	17:19	17:59	19:32						20:06		20:38	06:50-06:56/6			20:58	19:19-19:44/25	
24	07:39	07:02	07:15	07:34-07:57/23					06:24	07:08-07:41/33	05:49	06:17-06:48/31	19:05-19:47/42		05:41	06:22-07:01/39	
	17:20	18:00	19:33						20:07		20:39	06:48-06:56/8			20:58	19:19-19:44/25	
25	07:38	07:00	07:13	07:33-07:58/25					06:22	07:10-07:40/30	05:48	06:16-06:46/30	19:05-19:46/41		05:41	06:23-07:02/39	
	17:22	18:02	19:35						20:08		20:40	06:46-06:56/10			20:58	19:18-19:44/26	
26	07:37	06:59	07:12	07:32-07:57/25					06:21	07:11-07:39/28	05:47	06:17-06:57/40			05:42	06:23-07:02/39	
	17:23	18:03	19:36						20:10		20:41	19:06-19:47/41			20:58	19:19-19:45/26	
27	07:37	06:57	07:10	07:31-07:56/25					06:19	07:12-07:36/24	05:46	06:16-06:57/41			05:42	06:23-07:02/39	
	17:24	18:04	19:37						20:11		20:42	19:06-19:46/40			20:58	19:19-19:46/27	
28	07:36	06:56	07:08	07:32-07:56/24					06:18	07:14-07:34/20	05:46	06:17-06:58/41			05:42	06:24-07:03/39	
	17:25	18:05	19:38						20:12		20:43	19:07-19:46/39			20:58	19:19-19:47/28	
29	07:35		07:06	07:32-07:55/23					06:16	07:16-07:30/14	05:45	06:17-06:57/40			05:43	06:23-07:02/39	
	17:27		19:39						20:13	19:19-19:33/14	20:44	19:07-19:46/39			20:58	19:19-19:47/28	
30	07:34		07:05	07:33-07:53/20					06:15	19:16-19:36/20	05:44	06:17-06:58/41			05:43	06:24-07:03/39	
	17:28		19:40						20:14		20:45	19:08-19:46/38			20:58	19:18-19:47/29	
31	07:33		07:03	07:29-07:35/6							05:44	06:17-06:58/41					
	17:29		19:41	07:35-07:52/17							20:46	19:08-19:45/37					
Potential sun hours	294		295		370			401		1049		452		2192		457	2043
Sum of minutes with flicker	0		0		277												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 11:06 AM / 7

Licensed user:

EDR

217 Montgomery St.

US-SYRACUSE, NY 13202

(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110**WTG:** 16 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (128)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	July			August			September			October			November			December		
1	05:44	06:24-07:03/39		06:09	06:36-07:06/30		06:42	07:07-07:49/42		07:14	06:50		07:26					
	20:58	19:19-19:48/29		20:39	19:14-19:56/42		19:53			19:00	17:12		16:46					
2	05:44	06:24-07:04/40		06:10	06:36-07:06/30		06:43	07:07-07:48/41		07:15	06:51		07:27					
	20:58	19:18-19:48/30		20:38	19:15-19:56/41		19:51			18:58	17:10		16:46					
3	05:45	06:24-07:04/40		06:11	06:39-07:05/26		06:44	07:07-07:47/40		07:16	06:52		07:28					
	20:58	19:18-19:49/31		20:37	19:15-19:55/40		19:49			18:57	17:09		16:45					
4	05:45	06:25-07:04/39		06:12	06:40-07:05/25		06:45	07:07-07:46/39		07:17	06:54		07:29					
	20:58	19:19-19:50/31		20:35	19:15-19:55/40		19:48			18:55	17:08		16:45					
5	05:46	06:24-07:04/40		06:13	06:40-07:05/25		06:46	07:08-07:45/37		07:18	06:55		07:30					
	20:58	19:18-19:50/32		20:34	19:16-19:54/38		19:46			18:53	17:07		16:45					
6	05:47	06:25-07:05/40		06:14	06:41-07:04/23		06:47	07:08-07:44/36		07:19	06:56		07:31					
	20:57	19:18-19:51/33		20:33	19:16-19:53/37		19:44			18:52	17:05		16:45					
7	05:47	06:24-07:04/40		06:15	06:41-07:03/22		06:48	07:09-07:42/33		07:20	06:57		07:32					
	20:57	19:17-19:50/33		20:32	19:17-19:53/36		19:42			18:50	17:04		16:45					
8	05:48	06:25-07:05/40		06:16	06:42-07:03/21		06:49	07:10-07:41/31		07:21	06:59		07:33					
	20:57	19:17-19:51/34		20:31	19:18-19:52/34		19:41			18:48	17:03		16:45					
9	05:49	06:25-07:05/40		06:17	06:43-07:01/18		06:50	07:11-07:39/28		07:23	07:00		07:34					
	20:56	19:17-19:52/35		20:29	19:19-19:50/31		19:39			18:46	17:02		16:45					
10	05:49	06:24-07:05/41		06:18	06:44-07:00/16		06:51	07:13-07:37/24		07:24	07:01		07:35					
	20:56	19:17-19:52/35		20:28	19:20-19:49/29		19:37	07:37-07:39/2		18:45	17:01		16:45					
11	05:50	06:25-07:05/40		06:19	06:45-06:58/13		06:52	07:15-07:34/19		07:25	07:02		07:36					
	20:56	19:17-19:53/36		20:27	19:21-19:47/26		19:35	07:34-07:42/8		18:43	17:00		16:45					
12	05:51	06:25-07:06/41		06:20	06:48-06:55/7		06:53	07:20-07:29/9		07:26	07:04		07:37					
	20:55	19:17-19:54/37		20:25	19:23-19:46/23		19:34	07:29-07:44/15		18:41	16:59		16:45					
13	05:52	06:26-07:06/40		06:22	07:28-07:35/7		06:54	07:24-07:45/21		07:27	07:05		07:38					
	20:55	19:17-19:54/37		20:24	19:25-19:43/18		19:32			18:40	16:58		16:45					
14	05:52	06:25-07:06/41		06:23	07:24-07:40/16		06:55	07:23-07:45/22		07:28	07:06		07:38					
	20:54	19:16-19:54/38		20:22	19:28-19:39/11		19:30			18:38	16:57		16:45					
15	05:53	06:25-07:06/41		06:24	07:22-07:42/20		06:56	07:22-07:45/23		07:29	07:07		07:39					
	20:54	19:16-19:55/39		20:21			19:28			18:37	16:56		16:45					
16	05:54	06:26-07:06/40		06:25	07:19-07:44/25		06:58	07:21-07:46/25		07:31	07:09		07:40					
	20:53	19:16-19:55/39		20:20			19:27			18:35	16:55		16:46					
17	05:55	06:26-07:06/40		06:26	07:18-07:46/28		06:59	07:20-07:45/25		07:32	07:10		07:41					
	20:52	19:16-19:56/40		20:18			19:25			18:33	16:54		16:46					
18	05:56	06:27-07:07/40		06:27	07:16-07:47/31		07:00	07:20-07:45/25		07:33	07:11		07:41					
	20:52	19:16-19:56/40		20:17			19:23			18:32	16:53		16:46					
19	05:57	06:27-06:58/31 19:14-19:56/42		06:28	07:15-07:48/33		07:01	07:21-07:45/24		07:34	07:12		07:42					
	20:51	06:58-07:07/9		20:15			19:21			18:30	16:53		16:47					
20	05:57	06:26-06:59/33 19:14-19:56/42		06:29	07:13-07:49/36		07:02	07:22-07:44/22		07:35	07:14		07:42					
	20:50	06:59-07:06/7		20:14			19:20			18:29	16:52		16:47					
21	05:58	06:27-07:00/33 19:14-19:57/43		06:30	07:12-07:49/37		07:03	07:23-07:43/20		07:36	07:15		07:43					
	20:49	07:00-07:06/6		20:12			19:18			18:27	16:51		16:47					
22	05:59	06:27-07:02/35 19:14-19:57/43		06:31	07:11-07:50/39		07:04	07:24-07:42/18		07:38	07:16		07:44					
	20:49	07:02-07:06/4		20:11			19:16			18:26	16:50		16:48					
23	06:00	06:28-07:03/35 19:14-19:57/43		06:32	07:10-07:50/40		07:05	07:25-07:40/15		07:39	07:17		07:44					
	20:48	07:03-07:05/2		20:09			19:14			18:24	16:50		16:48					
24	06:01	06:28-07:04/36 19:14-19:57/43		06:33	07:10-07:50/40		07:06	07:26-07:38/12		07:40	07:18		07:45					
	20:47	07:04-07:05/1		20:07			19:12			18:23	16:49		16:49					
25	06:02	06:29-07:05/36		06:34	07:09-07:51/42		07:07	07:27-07:35/8		07:41	07:20		07:45					
	20:46	19:14-19:58/44		20:06			19:11			18:21	16:49		16:50					
26	06:03	06:30-07:04/34		06:35	07:08-07:51/43		07:08			07:43	07:21		07:45					
	20:45	19:14-19:58/44		20:04			19:09			18:20	16:48		16:50					
27	06:04	06:30-07:05/35		06:36	07:08-07:51/43		07:09			07:44	07:22		07:46					
	20:44	19:15-19:58/43		20:03			19:07			18:18	16:48		16:51					
28	06:05	06:31-07:06/35		06:37	07:07-07:50/43		07:10			07:45	07:23		07:46					
	20:43	19:15-19:58/43		20:01			19:05			18:17	16:47		16:52					
29	06:06	06:32-07:06/34		06:39	07:07-07:50/43		07:11			07:46	07:24		07:46					
	20:42	19:15-19:58/43		19:58			19:04			18:16	16:47		16:52					
30	06:07	06:33-07:06/33		06:40	07:07-07:50/43		07:13			07:47	07:25		07:46					
	20:41	19:15-19:58/43		19:56			19:02			18:14	16:46		16:53					
31	06:08	06:34-07:06/32		06:41	07:07-07:49/42					07:49			07:47					
	20:40	19:14-19:56/42		19:54						18:13			16:54					
Potential sun hours	463			431			375			343			294			283		
Sum of minutes with flicker	2380			1353			664			0			0					

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 11:06 AM / 8

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110**WTG:** 19 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (132)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117		541	386	285 8,759

Idle start wind speed: Cut in wind speed from power curve

	January		February		March		April		May		June	
1	07:47 08:43-09:26/43 16:55 14:57-15:28/31	07:32 08:16-09:20/64 17:31 16:35-16:51/16	06:54 07:23-07:27/4 16:47-17:09/22 18:06 07:27-08:36/69	07:01 19:43	06:14 07:01-07:58/57 20:15	05:43 06:26-06:55/29 20:47 07:18-07:40/22						
2	07:47 08:43-09:27/44 16:56 14:58-15:28/30	07:31 08:16-09:20/64 17:32 16:34-16:53/19	06:53 07:18-07:31/13 16:48-17:08/20 18:08 07:31-08:35/64	07:00 19:44	06:12 07:00-07:58/58 20:16	05:43 06:25-06:56/31 20:47 07:19-07:39/20						
3	07:47 08:44-09:27/43 16:57 14:59-15:28/29	07:30 08:16-09:20/64 17:33 16:34-16:54/20	06:51 07:16-07:34/18 16:50-17:06/16 18:09 07:34-08:36/62	06:58 19:45	06:11 07:00-07:58/58 20:17	05:42 06:24-06:57/33 20:48 07:21-07:38/17						
4	07:47 08:44-09:28/44 16:58 15:00-15:28/28	07:29 08:14-09:20/66 17:35 16:32-16:55/23	06:49 07:14-07:35/21 16:53-17:02/9 18:10 07:35-08:35/60	06:56 19:46	06:10 07:00-07:58/58 20:19	05:42 06:23-06:58/35 20:49 07:22-07:35/13						
5	07:47 08:41-08:49/8 15:01-15:28/27 16:59 08:49-09:28/39	07:28 08:14-09:20/66 17:36 16:32-16:56/24	06:48 07:12-07:35/23 18:11 07:35-08:34/59	06:54 19:47	06:08 07:00-07:58/58 20:20	05:42 06:22-06:59/37 20:50 07:24-07:34/10						
6	07:47 08:39-08:52/13 15:02-15:28/26 17:00 08:52-09:29/37	07:26 08:14-09:20/66 17:37 16:31-16:57/26	06:46 07:12-07:36/24 18:13 07:36-08:34/58	06:53 19:48	06:07 07:00-07:57/57 20:21	05:41 06:22-07:00/38 20:50						
7	07:47 08:38-08:55/17 15:04-15:28/24 17:01 08:55-09:29/34	07:25 08:14-09:20/66 17:38 16:31-16:57/26	06:44 07:11-07:36/25 18:14 07:36-08:33/57	06:51 19:49	06:06 07:00-07:57/57 20:22	05:41 06:22-07:01/39 20:51						
8	07:47 08:36-08:56/20 15:04-15:27/23 17:02 08:56-09:29/33	07:24 08:14-09:20/66 17:40 16:31-16:58/27	07:43 08:10-08:36/26 19:15 08:36-09:31/55	06:49 19:50	06:05 07:00-07:56/56 20:23	05:41 06:21-07:01/40 20:52						
9	07:47 08:35-08:58/23 15:06-15:27/21 17:03 08:58-09:29/31	07:23 08:13-09:19/66 17:41 16:31-16:57/26	07:41 08:10-08:37/27 19:16 08:37-09:31/54	06:48 19:52	06:03 07:00-07:56/56 20:24	05:41 06:21-07:02/41 20:52						
10	07:46 08:34-09:00/26 15:08-15:27/19 17:04 09:00-09:30/30	07:22 08:13-09:19/66 17:42 16:31-16:58/27	07:39 08:10-08:36/26 19:17 08:36-09:29/53	06:46 19:53	06:02 07:01-07:56/55 20:25	05:40 06:21-07:03/42 20:53						
11	07:46 08:33-09:01/28 15:09-15:25/16 17:05 09:01-09:29/28	07:20 08:14-09:19/65 17:44 16:31-16:58/27	07:38 08:01-08:10/9 19:18 08:10-08:28/8	06:44 19:54	06:01 07:01-07:56/55 20:26	05:40 06:21-07:04/43 20:53						
12	07:46 08:33-09:03/30 15:11-15:24/13 17:06 09:03-09:30/27	07:19 08:04-08:20/16 16:31-16:57/26 17:45 08:20-09:17/57	07:36 07:58-08:08/10 19:20 08:08-09:26/78	06:43 07:32-07:36/4 19:55	06:00 07:01-07:55/54 20:27	05:40 06:21-07:04/43 20:54						
13	07:45 08:32-09:05/33 15:15-15:22/7 17:07 09:05-09:30/25	07:18 08:00-08:24/24 16:32-17:02/30 17:46 08:24-09:17/53	07:34 07:56-08:12/16 19:21 08:11-09:24/73	06:41 07:24-07:43/19 19:56	05:59 07:02-07:55/53 20:28	05:40 06:21-07:05/44 20:55						
14	07:45 08:31-09:06/35 17:08 09:06-09:30/24	07:16 07:58-08:27/29 16:33-17:06/33 17:48 08:27-09:17/50	07:32 07:53-08:13/20 08:50-09:22/32 19:22 08:12-08:47/35	06:39 07:21-07:46/25 19:57	05:58 07:02-07:54/52 20:29	05:40 06:21-07:05/44 20:55						
15	07:45 08:31-09:08/37 17:09 09:08-09:30/22	07:15 07:56-08:28/32 16:33-17:08/35 17:49 08:28-09:15/47	07:31 07:52-08:14/22 08:51-09:19/28 19:23 08:13-08:44/31	06:38 07:17-07:48/31 19:58	05:57 07:03-07:54/51 20:31	05:40 06:21-07:06/45 20:55						
16	07:44 08:30-09:08/38 17:10 09:08-09:30/22	07:14 07:54-08:30/36 16:35-17:10/35 17:50 08:30-09:14/44	07:29 07:52-08:15/23 08:54-09:17/23 19:24 08:14-08:42/28	06:36 07:16-07:51/35 19:59	05:56 07:03-07:53/50 20:32	05:40 06:20-07:06/46 20:56						
17	07:44 08:30-09:10/40 17:12 09:10-09:30/20	07:12 07:52-08:31/39 16:36-17:11/35 17:51 08:31-09:12/41	07:27 07:50-08:14/24 08:17-08:24/7 08:58-09:13/15 19:25 08:14-08:16/2 08:33-08:36/3	06:35 07:13-07:52/39 20:01	05:55 07:04-07:52/48 20:33	05:40 06:20-07:06/46 20:56						
18	07:43 08:29-09:11/42 17:13 09:11-09:30/19	07:11 07:51-08:33/42 16:38-17:12/34 17:53 08:33-09:11/38	07:26 07:50-08:14/24 19:27 08:14-08:16/2	06:33 07:11-07:53/42 20:04	05:54 07:04-07:52/48 20:34	05:40 06:20-07:07/47 20:57						
19	07:43 08:29-09:12/43 17:14 09:12-09:29/17	07:09 07:51-08:34/43 16:42-17:12/30 17:54 08:34-09:10/36	07:24 07:49-08:13/24 19:28 08:13-08:15/2	06:31 07:10-07:54/44 20:02	05:53 07:05-07:51/46 20:35	05:40 06:20-07:07/47 20:57						
20	07:42 08:29-09:13/44 17:15 09:13-09:29/16	07:08 07:49-08:35/46 16:45-17:13/28 17:55 08:35-09:07/32	07:22 07:50-08:14/24 19:29 08:14-08:15/1	06:30 07:08-07:55/47 20:03	05:52 07:05-07:50/45 20:36	05:40 06:20-07:07/47 20:57						
21	07:41 08:28-09:14/46 17:17 09:14-09:29/15	07:06 07:49-08:36/47 16:44-17:13/29 17:57 08:36-09:05/29	07:20 07:49-08:13/24 19:30 08:13-08:14/1	06:28 07:07-07:56/49 20:04	05:51 07:06-07:49/43 20:37	05:40 06:20-07:07/47 20:58						
22	07:41 08:28-09:15/47 17:18 09:15-09:28/13	07:05 07:47-08:36/49 16:44-17:14/30 17:58 08:36-09:01/25	07:19 07:50-08:11/21 19:31 08:11-08:13/2	06:27 07:06-07:56/50 20:05	05:50 07:07-07:49/42 20:38	05:41 06:21-07:08/47 20:58						
23	07:40 08:26-09:15/49 17:19 09:15-09:27/12	07:03 07:46-08:36/50 16:44-17:13/29 17:59 08:36-08:54/18	07:17 07:50-08:10/20 19:32 08:10-08:11/1	06:25 07:05-07:57/52 20:06	05:49 07:08-07:48/40 20:39	05:41 06:21-07:08/47 20:58						
24	07:39 08:25-09:17/52 17:20 09:17-09:26/9	07:02 07:36-07:43/7 16:44-17:13/29 18:00 07:46-08:52/66	07:15 07:52-08:09/17 19:33 08:09-08:10/1	06:24 07:04-07:57/53 20:07	05:49 07:08-07:47/39 20:39	05:41 06:21-07:08/47 20:58						
25	07:38 08:23-09:17/54 17:22 09:17-09:25/8	07:00 07:31-07:48/17 16:44-17:13/29 18:02 07:48-08:49/61	07:13 07:53-08:06/13 19:35 08:06-08:07/1	06:22 07:04-07:58/54 20:08	05:48 07:09-07:46/37 20:40	05:41 06:22-07:09/47 20:58						
26	07:38 08:22-09:18/56 17:23 09:18-09:23/5	06:59 07:29-07:50/21 16:45-17:13/28 18:03 07:50-08:47/57	07:12 07:57-08:02/5 19:36	06:21 07:03-07:58/55 20:10	05:47 07:11-07:46/35 20:41	05:42 06:22-07:08/46 20:58						
27	07:37 08:20-09:19/59 17:24 09:19-09:21/2	06:57 07:27-07:52/25 16:45-17:11/26 18:04 07:52-08:43/51	07:10 19:37	06:19 07:02-07:58/56 20:11	05:46 06:38-06:41/3 20:42	05:42 06:23-07:08/45 20:58						
28	07:36 08:19-09:18/59 17:25	06:56 07:26-07:53/27 16:46-17:11/25 18:05 07:53-08:37/44	07:08 19:38	06:18 07:02-07:58/56 20:12	05:46 06:33-06:47/14 20:43	05:42 06:24-07:09/45 20:59						
29	07:35 08:18-09:19/61 17:27		07:06 19:39	06:16 07:01-07:58/57 20:13	05:45 06:30-06:49/19 20:44	05:43 06:24-07:08/44 20:59						
30	07:34 08:18-09:19/61 17:28 16:40-16:46/6		07:05 19:40	06:15 07:01-07:58/57 20:14	05:44 06:29-06:52/23 20:45	05:43 06:25-07:09/44 20:58						
31	07:33 08:17-09:19/62 17:29 16:37-16:49/12		07:03 19:41		05:44 06:27-06:53/26 20:46							
Potential sun hours	294	295	370	401	452	457						
Sum of minutes with flicker	2057	2790	1601	825	1540	1358						

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 11:06 AM / 9

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110**WTG:** 19 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (132)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	July		August		September		October		November		December	
1	05:44	06:25-07:08/43	06:09	07:12-08:06/54	06:42	07:14	07:36-07:50/14	06:50	07:43-08:49/66	07:26	08:15-08:43/28	14:51-15:07/16
	20:58		20:39		19:53	19:00	07:49-09:05/76	17:12	16:01-16:27/26	16:46	08:43-09:11/28	
2	05:44	06:26-07:08/42	06:10	07:11-08:05/54	06:43	07:15	07:38-07:45/7	06:51	07:43-08:49/66	07:27	08:17-08:43/26	14:51-15:10/19
	20:58		20:38		19:51	18:58	07:45-09:06/81	17:10	16:00-16:27/27	16:46	08:43-09:13/30	
3	05:45	06:26-07:08/42	06:11	07:10-08:06/56	06:44	07:16	07:47-08:14/27	06:52	07:43-08:49/66	07:28	08:19-08:42/23	14:50-15:11/21
	20:58		20:37		19:49	18:57	08:14-09:06/52	17:09	16:00-16:27/27	16:45	08:42-09:13/31	
4	05:45	06:27-07:08/41	06:12	07:10-08:06/56	06:45	07:17	07:47-08:13/26	06:54	07:44-08:50/66	07:30	08:21-08:41/20	14:49-15:12/23
	20:58		20:36		19:48	18:55	08:13-09:07/54	17:08	16:01-16:27/26	16:45	08:41-09:14/33	
5	05:46	06:27-07:07/40	06:13	07:10-08:06/56	06:46	07:18	07:47-08:13/26	06:55	07:44-08:50/66	07:31	08:23-08:40/17	14:49-15:13/24
	20:58		20:34		19:46	18:53	08:13-09:08/55	17:07	16:01-16:28/25	16:45	08:40-09:14/34	
6	05:47	06:28-07:07/39	06:14	07:09-08:06/57	06:47	07:19	07:47-08:13/26	06:56	07:44-08:50/66	07:32	08:25-08:39/14	14:48-15:14/26
	20:58		20:33		19:44	18:52	08:13-09:09/56	17:05	16:01-16:25/24	16:45	08:39-09:15/36	
7	05:47	06:28-07:06/38	06:15	07:09-08:06/57	06:48	07:20	07:47-08:12/25	06:57	07:45-08:51/66	07:32	08:28-08:36/8	14:48-15:15/27
	20:57	07:32-07:38/6	20:32		19:42	18:50	08:12-09:09/57	17:04	16:03-16:25/22	16:45	08:36-09:15/39	
8	05:48	06:30-07:05/35	06:16	07:09-08:07/58	06:49	07:21	07:48-08:11/23	06:59	07:45-08:50/65	07:33	08:32-09:16/44	
	20:57	07:30-07:42/12	20:31		19:41	18:48	08:11-09:09/58	17:03	16:03-16:24/21	16:45	14:48-15:16/28	
9	05:49	06:31-07:05/34	06:17	07:09-08:07/58	06:50	07:23	07:48-08:10/22	07:00	07:47-08:51/64	07:34	08:33-09:16/43	
	20:57	07:28-07:44/16	20:29		19:39	18:47	08:10-09:09/59	17:02	16:04-16:23/19	16:45	14:48-15:17/29	
10	05:49	06:31-07:04/33	06:18	07:09-08:06/57	06:51	07:24	07:49-08:08/19	07:01	07:47-08:51/64	07:35	08:32-09:16/44	
	20:56	07:26-07:45/19	20:28		19:37	18:45	08:08-09:09/61	17:01	16:07-16:22/15	16:45	14:47-15:17/30	
11	05:50	06:33-07:03/30	06:19	07:09-08:06/57	06:52	07:25	07:50-08:06/16	07:02	07:48-08:50/62	07:36	08:33-09:16/43	
	20:56	07:26-07:47/21	20:27		19:36	18:43	08:06-09:09/63	17:00	16:08-16:20/12	16:45	14:48-15:18/30	
12	05:51	06:34-07:02/28	06:20	07:09-08:06/57	06:53	07:26	07:53-08:04/11	07:04	07:50-08:51/61	07:37	08:34-09:17/43	
	20:55	07:25-07:49/24	20:25		19:34	18:42	08:04-09:10/66	16:59	16:11-16:16/5	16:45	14:48-15:19/31	
13	05:52	06:36-07:01/25	06:22	07:10-08:07/57	06:54	07:27	07:58-08:27/29	07:05	07:50-08:51/61	07:38	08:34-09:18/44	
	20:55	07:24-07:50/26	20:24		19:32	18:40	08:27-09:09/42	16:58		16:45	14:48-15:20/32	
14	05:52	06:37-06:59/22	06:23	07:10-08:07/57	06:55	07:28	07:59-08:25/26	07:06	07:51-08:50/59	07:39	08:35-09:18/43	
	20:54	07:22-07:51/29	20:22		19:30	18:38	08:25-09:12/47	16:57		16:45	14:49-15:21/32	
15	05:53	06:40-06:57/17	06:24	07:10-08:06/56	06:57	07:29	08:00-08:23/23	07:07	07:53-08:52/59	07:39	08:35-09:18/43	
	20:54	07:22-07:52/30	20:21		19:28	18:37	08:23-09:17/54	16:56	08:52-08:54/2	16:45	14:48-15:20/32	
16	05:54	06:44-06:54/10	06:25	07:10-08:06/56	06:58	07:31	08:02-08:21/19	07:09	07:55-08:51/56	07:40	08:35-09:19/44	
	20:53	07:21-07:53/32	20:20		19:27	18:35	08:21-09:20/59	16:55	08:51-08:56/5	16:46	14:49-15:21/32	
17	05:55	07:20-07:55/35	06:26	07:10-08:05/55	06:59	07:32	08:05-08:19/14	07:10	07:56-08:50/54	07:41	08:36-09:20/44	
	20:52		20:18		19:25	18:33	08:19-09:23/64	16:54	08:50-08:58/8	16:46	14:49-15:22/33	
18	05:56	07:20-07:56/36	06:27	07:10-08:04/54	07:00	07:33	08:18-08:08/50	07:11	07:58-08:50/52	07:41	08:36-09:20/44	
	20:52		20:17		19:23	18:32	09:08-09:24/16	16:53	08:50-08:59/9	16:46	14:49-15:22/33	
19	05:57	07:19-07:57/38	06:28	07:11-08:04/53	07:01	07:34	08:19-09:07/49	07:12	08:01-08:50/49	07:42	08:37-09:20/43	
	20:51		20:15		19:21	18:30	09:07-09:29/22	16:53	08:50-09:02/12	16:47	14:50-15:23/33	
20	05:57	07:18-07:57/39	06:29	07:11-08:03/52	07:02	07:35	08:18-09:06/48	07:14	08:03-08:50/47	07:43	08:38-09:21/43	
	20:50		20:14		19:20	18:29	09:06-09:33/27	16:52	08:50-09:03/13	16:47	14:51-15:24/33	
21	05:58	07:17-07:58/41	06:30	07:12-08:02/50	07:03	07:37	08:19-09:06/47	07:15	08:03-08:49/46	07:43	08:38-09:21/43	
	20:49		20:12		19:18	18:27	09:06-09:36/30	16:51	08:49-09:04/15	16:47	14:51-15:24/33	
22	05:59	07:16-07:59/43	06:31	07:12-08:01/49	07:04	07:38	08:20-09:05/45	07:16	08:05-08:49/44	07:44	08:39-09:22/43	
	20:49		20:11		19:16	18:26	09:05-09:38/33	16:50	08:49-09:05/16	16:48	14:52-15:25/33	
23	06:00	07:16-08:00/44	06:32	07:13-07:59/46	07:05	07:39	08:20-09:03/43	07:17	08:06-08:49/43	07:44	08:39-09:22/43	
	20:48		20:09		19:14	18:24	09:03-09:40/37	16:50	08:49-09:06/17	16:48	14:52-15:25/33	
24	06:01	07:15-08:01/46	06:33	07:14-07:58/44	07:06	07:40	08:21-09:02/41	07:18	08:06-08:48/42	07:45	08:39-09:22/43	
	20:47		20:07		19:13	18:23	09:02-09:41/39	16:49	08:48-09:07/19	16:49	14:52-15:25/33	
25	06:02	07:15-08:02/47	06:34	07:15-07:56/41	07:07	07:41	08:23-09:01/38	07:20	08:07-08:47/40	07:45	08:40-09:23/43	
	20:46		20:06		19:11	18:21	09:01-09:43/42	16:49	08:47-09:07/20	16:50	14:53-15:26/33	
26	06:03	07:14-08:02/48	06:35	07:16-07:55/39	07:08	07:43	08:24-08:59/35	07:21	08:09-08:47/38	07:45	08:40-09:24/44	
	20:45		20:04		19:09	18:20	08:59-09:44/45	16:48	08:47-09:09/22	16:50	14:53-15:26/33	
27	06:04	07:14-08:03/49	06:36	07:18-07:53/35	07:09	07:44	08:26-08:57/31	07:22	08:10-08:47/37	07:46	08:40-09:24/44	
	20:44		20:03		19:07	18:18	08:57-09:45/48	16:48	08:47-09:09/22	16:51	14:54-15:26/32	
28	06:05	07:14-08:04/50	06:37	07:19-07:50/31	07:10	07:45	08:28-08:56/28	07:23	08:11-08:46/35	07:46	08:42-09:25/43	
	20:43		20:01		19:05	18:17	08:56-09:46/50	16:47	08:46-09:10/24	16:52	14:55-15:27/32	
29	06:06	07:13-08:04/51	06:39	07:22-07:47/25	07:12	07:46	08:31-08:53/22	07:24	08:12-08:45/33	07:46	08:42-09:25/43	
	20:42		19:58		19:04	18:16	08:53-09:47/54	16:47	08:45-09:10/25	16:52	14:55-15:27/32	
30	06:07	07:13-08:05/52	06:40	07:25-07:43/18	07:13	07:47	08:34-08:49/14	07:25	08:14-08:44/30	07:46	08:42-09:26/44	
	20:41		19:56		19:02	18:14	08:48-09:47/59	16:46	08:44-09:11/27	16:53	14:56-15:28/32	
31	06:08	07:12-08:05/53	06:41	07:33-07:35/2		07:49	08:42-09:48/66			07:47	08:42-09:26/44	
	20:40		19:54			18:13	17:00-17:27/27			16:54	14:57-15:28/31	
Potential sun hours	463		431		375	343		294		283		
Sum of minutes with flicker	1406		1497		526	3024		2128		2330		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

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Licensed user:

EDR

217 Montgomery St.

US-SYRACUSE, NY 13202

(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110WTG: 21 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (133)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	January				February				March				April				May				June			
1	07:47	08:27-08:58/31			07:32	08:15-08:37/22			16:28-17:06/38	06:54	16:45-16:53/8			07:01		06:14	18:57-19:52/55			05:43	19:17-19:35/18			
	16:55	15:25-16:15/50			17:31	15:51-16:12/21				18:07				19:43		20:15				20:47				
2	07:47	08:27-08:58/31			07:31	08:16-08:36/20			16:27-17:08/41	06:53				07:00		06:12	18:57-19:51/54			05:43	19:18-19:33/15			
	16:56	15:25-16:15/50			17:32	15:54-16:09/15				18:08				19:44		20:16				20:47				
3	07:47	08:28-08:58/30			07:30	08:17-08:35/18				06:51				06:58		06:11	18:57-19:51/54			05:43	19:21-19:31/10			
	16:57	15:25-16:16/51			17:33	16:27-17:09/42				18:09				19:45		20:17				20:48				
4	07:47	08:29-08:59/30			07:29	08:19-08:33/14				06:49				06:56		06:10	18:57-19:52/55			05:42	19:24-19:27/3			
	16:58	15:26-16:16/50			17:35	16:26-17:10/44				18:10				19:46		20:19				20:49				
5	07:47	08:29-08:59/30			07:28	08:21-08:30/9				06:48				06:54		06:08	18:57-19:52/55			05:42				
	16:59	15:26-16:17/51			17:36	16:25-17:11/46				18:11				19:47		20:20				20:50				
6	07:47	08:30-09:00/30			07:27	16:25-17:12/47				06:46				06:53		06:07	18:56-19:51/55			05:41				
	17:00	15:27-16:18/51			17:37					18:13				19:48		20:21				20:50				
7	07:47	08:31-09:00/29			07:25	16:25-17:13/48				06:44				06:51		06:06	18:57-19:51/54			05:41				
	17:01	15:28-16:18/50			17:39					18:14				19:49		20:22				20:51				
8	07:47	08:30-09:00/30			07:24	16:25-17:13/48				07:43				06:49		06:05	18:57-19:51/54			05:41				
	17:02	15:27-16:18/51			17:40					19:15				19:51		20:23				20:52				
9	07:47	08:15-08:23/8			15:28-16:19/51	07:23	16:24-17:13/49				07:41				06:48		06:03	18:57-19:51/54			05:41			
	17:03	08:31-09:00/29			17:41					19:16				19:52		20:24				20:52				
10	07:46	08:14-08:25/11			15:29-16:19/50	07:22	16:24-17:14/50				07:39				06:46		06:02	18:58-19:50/52			05:40			
	17:04	08:32-09:01/29			17:42					19:17				19:53		20:25				20:53				
11	07:46	08:12-08:26/14			15:29-16:19/50	07:20	16:25-17:14/49				07:38				06:44		06:01	18:58-19:50/52			05:40			
	17:05	08:32-09:00/28			17:44					19:19				19:54		20:26				20:53				
12	07:46	08:12-08:28/16			15:30-16:20/50	07:19	16:24-17:14/50				07:36				06:43		06:00	18:58-19:50/52			05:40			
	17:06	08:33-09:01/28			17:45					19:20				19:55		20:27				20:54				
13	07:45	08:12-08:30/18			15:30-16:20/50	07:18	16:24-17:14/50				07:34				06:41		05:59	18:59-19:49/50			05:40	20:20-20:25/5		
	17:07	08:35-09:01/26			17:46					19:21				19:56		20:28				20:55				
14	07:45	08:11-08:30/19			15:30-16:20/50	07:16	16:25-17:14/49				07:33	19:22-19:34/12			06:39	18:59-19:49/50			05:40	20:18-20:27/9				
	17:08	08:35-09:00/25			17:48					19:22				19:57		20:29				20:55				
15	07:45	08:11-08:32/21			15:32-16:21/49	07:15	16:24-17:13/49				07:31	19:17-19:36/19			06:38	19:00-19:48/48			05:40	20:17-20:28/11				
	17:09	08:36-09:01/25			17:49					19:23				19:58		20:31				20:55				
16	07:44	08:10-08:32/22			15:32-16:20/48	07:14	16:25-17:14/49				07:29	19:14-19:37/23			06:36	19:00-19:48/48			05:40	20:16-20:29/13				
	17:11	08:37-09:00/23			17:50					19:24				20:00		20:32				20:56				
17	07:44	08:11-08:34/23			15:33-16:21/48	07:12	16:25-17:13/48				07:27	19:11-19:38/27			06:35	19:01-19:47/46			05:40	20:16-20:30/14				
	17:12	08:38-09:00/22			17:51					19:26				20:00		20:33				20:56				
18	07:43	08:10-08:34/24			15:33-16:21/48	07:11	16:26-17:13/47				07:26	19:09-19:38/29			06:33	19:01-19:47/46			05:40	20:15-20:31/16				
	17:13	08:39-08:59/20			17:53					19:27				20:01		20:34				20:57				
19	07:43	08:10-08:35/25			15:33-16:20/47	07:09	16:27-17:13/46				07:24	19:07-19:40/33			06:31	19:02-19:46/44			05:40	20:15-20:31/16				
	17:14	08:40-08:58/18			17:54					19:28				20:02		20:35				20:57				
20	07:42	08:10-08:36/26			15:35-16:21/46	07:08	16:27-17:11/44				07:22	19:05-19:41/36			06:30	19:03-19:45/42			05:40	20:15-20:31/16				
	17:15	08:43-08:57/14			17:55					19:29				20:03		20:36				20:57				
21	07:41	08:10-08:36/26			15:35-16:21/46	07:07	16:28-17:11/43				07:20	19:04-19:42/38			06:28	19:03-19:44/41			05:40	20:15-20:31/16				
	17:17	08:45-08:55/10			17:57					19:30				20:04		20:37				20:58				
22	07:41	08:10-08:37/27			16:41-16:51/10	07:05	16:29-17:09/40				07:19	19:03-19:43/40			06:27	19:05-19:44/39			05:41	20:16-20:32/16				
	17:18	15:36-16:20/44			17:58					19:31				20:05		20:38				20:58				
23	07:40	08:10-08:37/27			16:41-16:51/10	07:04	16:29-17:08/39				07:17	19:02-19:44/42			06:25	19:05-19:43/38			05:41	20:16-20:32/16				
	17:19	15:37-16:20/43			17:59					19:32				20:06		20:39				20:58				
24	07:39	08:11-08:38/27			16:38-16:55/17	07:02	16:31-17:07/36				07:15	19:01-19:45/44			06:24	19:06-19:42/36			05:41	20:16-20:32/16				
	17:20	15:38-16:20/42			18:00					19:34				20:07		20:40				20:58				
25	07:38	08:11-08:38/27			16:36-16:56/20	07:00	16:32-17:05/33				07:13	19:00-19:46/46			06:22	19:08-19:42/34			05:41	20:17-20:32/15				
	17:22	15:39-16:20/41			18:02					19:35				20:09		20:40				20:58				
26	07:38	08:11-08:38/27			16:34-16:58/24	06:59	16:35-17:04/29				07:12	19:00-19:48/48			06:21	19:08-19:41/33			05:42	20:18-20:32/14				
	17:23	15:40-16:19/39			18:03					19:36				20:10		20:41				20:58				
27	07:37	08:11-08:38/27			16:33-16:59/26	06:57	16:36-17:01/25				07:10	18:59-19:48/49			06:19	19:09-19:40/31			05:42	20:18-20:31/13				
	17:24	15:41-16:18/37			18:04					19:37				20:11		20:42				20:59				
28	07:36	08:12-08:38/26			16:31-17:00/29	06:56	16:40-16:58/18				07:08	18:59-19:50/51			06:18	19:11-19:40/29			05:43	20:20-20:30/10				
	17:25	15:43-16:17/34			18:05					19:38				20:12		20:43				20:59				
29	07:35	08:12-08:38/26			16:30-17:02/32						07:06	18:57-19:50/53			06:16	19:12-19:38/26			05:43	20:22-20:29/7				
	17:27	15:44-16:16/32								19:39				20:13		20:44				20:59				
30	07:34	08:13-08:38/25			16:29-17:03/34						07:05	18:57-19:51/54			06:15	19:14-19:38/24			05:43					
	17:28	15:46-16:15/29								19:40				20:14		20:45				20:59				
31	07:33	08:14-08:37/23			16:29-17:05/36						07:03						05:44	19:15-19:36/21						
	17:29	15:48-16:13/25								19:41						20:46								
Potential sun hours	294				295				370				401				452				457			
Sum of minutes with flicker	2684				1316				8				644				1372				269			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 11:06 AM / 11

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110**WTG:** 21 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (133)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

[July]		[August]		[September]		[October]		[November]		[December]	
1	05:44 20:58	06:09 20:39	19:09-20:00/51	06:42 19:53	07:14 19:00			06:50 17:12	15:54-16:43/49	07:26 16:46	07:54-08:08/14 08:14-08:42/28
2	05:44 20:58	06:10 20:38	19:07-20:00/53	06:43 19:51	07:15 18:59			06:51 17:10	15:54-16:43/49	07:27 16:46	07:57-08:08/11 08:15-08:44/29
3	05:45 20:58	06:11 20:37	19:07-20:00/53	06:44 19:49	07:16 18:57			06:52 17:09	15:54-16:42/48	07:29 16:45	07:59-08:07/8 08:15-08:44/29
4	05:45 20:58	06:12 20:36	19:07-20:00/53	06:45 19:48	07:17 18:55			06:54 17:08	15:55-16:43/48	07:30 16:45	08:02-08:04/2 08:15-08:45/30
5	05:46 20:58	06:13 20:34	19:06-20:00/54	06:46 19:46	07:18 18:53			06:55 17:07	15:55-16:42/47	07:31 16:45	08:16-08:45/29 15:13-16:03/50
6	05:47 20:58	06:14 20:33	19:06-20:00/54	06:47 19:44	07:19 18:52			06:56 17:06	07:52-08:01/9 15:55-16:41/46	07:32 16:45	08:16-08:46/30 15:13-16:04/51
7	05:47 20:57	06:15 20:32	19:06-20:00/54	06:48 19:43	07:20 18:50			06:57 17:04	07:49-08:03/14 15:56-16:40/44	07:33 16:45	08:16-08:46/30 15:14-16:04/50
8	05:48 20:57	06:16 20:31	19:06-20:00/54	06:49 19:41	07:22 18:48			06:59 17:03	07:47-08:05/18 15:57-16:39/42	07:33 16:45	08:17-08:47/30 15:14-16:05/51
9	05:49 20:57	19:29-19:37/8 20:29	19:05-20:00/55	06:50 19:39	07:23 18:47			07:00 17:02	07:47-08:07/20 15:57-16:37/40	07:34 16:45	08:17-08:48/31 15:14-16:05/51
10	05:49 20:56	19:26-19:39/13 20:28	19:05-20:00/55	06:51 19:37	07:24 18:45			07:01 17:01	07:45-08:08/23 15:59-16:37/38	07:35 16:45	08:18-08:48/30 15:14-16:05/51
11	05:50 20:56	19:25-19:42/17 20:27	19:05-20:00/55	06:52 19:36	07:25 18:43			07:03 17:00	07:45-08:08/23 16:00-16:35/35	07:36 16:45	08:17-08:48/31 15:15-16:05/50
12	05:51 20:55	19:24-19:44/20 20:25	19:05-19:59/54	06:53 19:34	07:26 18:42			07:04 16:59	07:45-08:10/25 16:01-16:35/34	07:37 16:45	08:18-08:48/30 15:15-16:06/51
13	05:52 20:55	19:23-19:45/22 20:24	19:06-20:00/54	06:54 19:32	07:27 18:40	17:15-17:29/14		07:05 16:58	07:44-08:10/26 16:02-16:34/32	07:38 16:45	08:18-08:49/31 15:16-16:06/50
14	05:52 20:54	19:21-19:46/25 20:23	19:06-19:59/53	06:56 19:30	07:28 18:38	17:11-17:32/21		07:06 16:57	07:44-08:10/26 16:03-16:32/29	07:39 16:45	08:19-08:50/31 15:17-16:07/50
15	05:53 20:54	19:20-19:47/27 20:21	19:06-19:57/51	06:57 19:28	07:30 18:37	17:08-17:34/26		07:07 16:56	07:44-08:11/27 16:06-16:32/26	07:39 16:45	08:20-08:50/30 15:16-16:07/51
16	05:54 20:53	19:19-19:49/30 20:20	19:07-19:56/49	06:58 19:27	07:31 18:35	17:05-17:36/31		07:09 16:55	07:44-08:11/27 16:07-16:31/24	07:40 16:46	08:19-08:50/31 15:17-16:07/50
17	05:55 20:52	19:18-19:50/32 20:18	19:07-19:54/47	06:59 19:25	07:32 18:33	17:04-17:38/34		07:10 16:54	07:44-08:11/27 16:09-16:29/20	07:41 16:46	08:20-08:51/31 15:18-16:08/50
18	05:56 20:52	19:18-19:51/33 20:17	19:07-19:53/46	07:00 19:23	07:33 18:32	17:02-17:39/37		07:11 16:54	07:45-08:12/27 16:11-16:28/17	07:41 16:46	08:21-08:52/31 15:18-16:08/50
19	05:57 20:51	19:17-19:52/35 20:15	19:08-19:51/43	07:01 19:21	07:34 18:30	17:01-17:40/39		07:12 16:53	07:45-08:12/27 16:16-16:26/10	07:42 16:47	08:21-08:52/31 15:19-16:09/50
20	05:58 20:50	19:15-19:52/37 20:14	19:08-19:50/42	07:02 19:20	07:35 18:29	16:59-17:40/41		07:14 16:52	07:45-08:12/27 15:11-15:55/44	07:43 16:47	08:22-08:53/31 15:20-16:10/50
21	05:58 20:50	19:15-19:53/38 20:12	19:09-19:48/39	07:03 19:18	07:37 18:27	16:59-17:42/43		07:15 16:51	07:45-08:11/26 15:10-15:56/46	07:43 16:47	08:22-08:53/31 15:20-16:10/50
22	05:59 20:49	19:14-19:54/40 20:11	19:09-19:47/38	07:04 19:16	07:38 18:26	16:57-17:42/45		07:16 16:51	07:46-08:12/26 15:11-15:57/46	07:44 16:48	08:23-08:54/31 15:21-16:11/50
23	06:00 20:48	19:13-19:55/42 20:09	19:10-19:45/35	07:05 19:14	07:39 18:24	16:56-17:42/46		07:17 16:50	07:47-08:12/25 15:10-15:57/47	07:44 16:48	08:23-08:54/31 15:21-16:11/50
24	06:01 20:47	19:13-19:56/43 20:08	19:11-19:44/33	07:06 19:13	07:40 18:23	16:55-17:42/47		07:18 16:49	07:47-08:11/24 15:10-15:58/48	07:45 16:49	08:23-08:54/31 15:21-16:11/50
25	06:02 20:46	19:12-19:57/45 20:06	19:13-19:42/29	07:07 19:11	07:41 18:21	16:55-17:43/48		07:20 16:49	07:48-08:11/23 15:10-15:58/48	07:45 16:50	08:24-08:55/31 15:22-16:12/50
26	06:03 20:45	19:12-19:57/45 20:04	19:14-19:41/27	07:08 19:09	07:43 18:20	16:55-17:43/48		07:21 16:48	07:49-08:11/22 15:11-15:59/48	07:45 16:50	08:24-08:55/31 15:22-16:12/50
27	06:04 20:44	19:11-19:58/47 20:03	19:16-19:39/23	07:09 19:07	07:44 18:18	16:54-17:43/49		07:22 16:48	07:50-08:11/21 15:11-16:00/49	07:46 16:51	08:24-08:55/31 15:22-16:12/50
28	06:05 20:43	19:11-19:59/48 20:01	19:19-19:37/18	07:10 19:05	07:45 18:17	16:54-17:44/50		07:23 16:47	07:51-08:10/19 15:11-16:00/49	07:46 16:52	08:26-08:56/30 15:23-16:13/50
29	06:06 20:42	19:10-19:59/49 19:58	19:23-19:35/12	07:12 19:04	07:46 18:16	16:54-17:44/50		07:24 16:47	07:52-08:10/18 15:11-16:00/49	07:46 16:52	08:26-08:57/31 15:24-16:14/50
30	06:07 20:41	19:10-20:00/50 19:56		07:13 19:02	07:48 18:14	16:54-17:43/49		07:25 16:46	07:53-08:09/16 15:11-16:01/50	07:47 16:53	08:26-08:57/31 15:24-16:14/50
31	06:08 20:40	19:09-20:00/51 19:54			07:49 18:13	16:53-17:43/50			08:14-08:42/28	07:47 16:54	08:27-08:57/30 15:24-16:14/50
Potential sun hours		463		375	343			294		2342	2536
Sum of minutes with flicker		797	431	1284	0	768					

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 11:06 AM / 12

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110WTG: 22 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (140)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117		541	386	285 8,759

Idle start wind speed: Cut in wind speed from power curve

[January]**[February]****[March]****[April]****[May]****[June]**

1	07:47	09:17-10:17/60	07:32	16:00-16:27/27	06:54	16:51-17:41/50	07:01	18:02-18:54/52	06:14		05:43	06:32-07:08/36
	16:55	15:43-16:20/37	17:31	16:26-16:57/31	18:06	17:41-17:44/3	19:43	18:53-19:08/15	20:15		20:47	19:52-20:19/27
2	07:47	09:18-10:18/60	07:31	16:02-16:26/24	06:53	16:50-17:40/50	07:00	18:02-18:53/51	06:12		05:43	06:32-07:07/35
	16:56	15:43-16:21/38	17:32	16:25-16:58/33	18:08	17:40-17:45/5	19:44	18:52-19:07/15	20:16		20:47	19:50-20:20/30
3	07:47	09:18-10:18/60	07:30	16:04-16:24/20	06:51	16:49-17:41/52	06:58	18:02-18:51/49	06:11		05:43	06:33-07:08/35
	16:57	15:43-16:21/38	17:33	16:23-16:59/36	18:09	17:41-17:47/6	19:45	18:50-19:07/17	20:18		20:48	19:50-20:21/31
4	07:47	09:19-10:18/59	07:29	16:05-16:21/16	06:49	16:48-17:41/53	06:56	18:02-18:49/47	06:10		05:42	06:32-07:07/35
	16:58	15:44-16:22/38	17:35	16:20-17:00/40	18:10	17:40-17:48/8	19:46	18:48-19:06/18	20:19		20:49	19:49-20:21/32
5	07:47	09:20-10:19/59	07:28	16:04-16:53/49	06:48	16:46-17:41/55	06:54	18:03-18:48/45	06:08	06:46-06:53/7	05:42	06:33-07:07/34
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	17:02	15:44-16:24/40	17:40	16:54-17:02/8	19:15	18:38-18:53/15	19:51	18:40-19:04/24	20:23		20:52	19:47-20:24/37
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	17:04	15:45-16:26/41	17:42	16:53-17:02/9	19:17	18:37-18:56/19	19:53	18:45-19:01/16	20:25		20:53	19:47-20:26/39
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	17:11	15:47-16:29/42	17:50	16:49-17:01/12	19:24		20:00		20:32		20:56	19:47-20:29/42
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	17:12	15:48-16:30/42	17:51	16:48-17:00/12	19:26		20:00		20:33		20:56	19:47-20:29/42
18	07:43	09:30-10:18/48	07:11	16:13-16:47/34	07:26	17:44-19:05/81	06:33	18:30-18:46/16	05:54	06:30-07:07/37	05:40	06:38-07:07/29
	17:13	15:48-16:30/42	17:53	16:47-17:00/13	19:27		20:01		20:34		20:57	19:47-20:29/42
19	07:43	09:30-10:17/47	07:09	16:15-16:46/31	07:24	17:44-19:05/81	06:31	18:38-18:39/1	05:53	06:30-07:07/37	05:40	06:38-07:08/30
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21	07:41	09:33-10:16/43	07:07	16:19-16:57/38	07:20	17:46-19:05/79	06:28		05:51	06:29-07:07/38	05:40	06:39-07:08/29
	17:17	15:49-16:31/42	17:57	17:12-17:33/21	19:30		20:04		20:37		20:58	19:47-20:30/43
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	17:19	15:50-16:30/40	17:59	17:07-17:36/29	19:32		20:06		20:39		20:58	19:48-20:31/43
24	07:39	09:38-10:13/35	07:02	16:29-16:51/22	07:15	17:50-19:01/71	06:24		05:49	06:30-07:08/38	05:41	06:39-07:09/30
	17:20	15:51-16:32/41	18:00	17:03-17:37/34	19:34	19:01-19:05/4	20:07		20:40		20:58	19:48-20:30/42
25	07:38	09:39-10:11/32	07:00	16:31-16:48/17	07:13	17:51-19:00/69	06:22		05:48	06:31-07:08/37	05:41	06:40-07:09/29
	17:22	15:52-16:32/40	18:02	16:59-17:37/38	19:35	19:00-19:06/6	20:09		20:40		20:58	19:49-20:31/42
26	07:38	09:41-10:09/28	06:59	16:37-16:43/6	07:12	17:53-18:58/65	06:21		05:47	06:30-07:08/38	05:42	06:40-07:09/29
	17:23	15:53-16:31/38	18:03	16:57-17:39/42	19:36	18:58-19:06/8	20:10		20:41		20:58	19:49-20:31/42
27	07:37	09:44-10:07/23	06:57	16:54-17:40/46	07:10	17:55-18:57/62	06:19		05:46	06:30-07:08/38	05:42	06:40-07:09/29
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	17:25	15:54-16:30/36	18:05	17:41-17:43/2	19:38	18:56-19:07/11	20:12		20:43	19:57-20:13/16	20:59	19:50-20:31/41
29	07:35	15:55-16:30/35			07:06	18:02-18:57/55	06:16		05:45	06:31-07:08/37	05:43	06:40-07:10/30
	17:27	16:29-16:54/25			19:39	18:57-19:07/10	20:13		20:44	19:55-20:15/20	20:59	19:50-20:31/41
30	07:34	15:57-16:29/32			07:05	18:02-18:55/53	06:15		05:45	06:32-07:08/36	05:43	06:41-07:11/30
	17:28	16:28-16:55/27			19:40	18:54-19:07/13	20:14		20:45	19:54-20:17/23	20:59	19:51-20:31/40
31	07:33	15:58-16:28/30			07:03	18:01-18:54/53			05:44	06:31-07:08/37		
	17:29	16:27-16:56/29			19:41	18:53-19:07/14			20:46	19:52-20:18/26		
Potential sun hours			294		370		401		452		457	
Sum of minutes with flicker			2795	1520	2196	896	970	2105				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

Printed/Page

8/31/2015 11:06 AM / 13

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG

Calculation: 2015-08-31_Arkwright Summit SFA_Vestas V110WTG: 22 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (140)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	05:44 06:40-07:11/31 20:58 19:51-20:31/40	06:09 06:44-07:15/31 20:39	06:42 18:08-18:43/35 19:53 18:43-19:00/17	07:14 17:22-18:38/76 19:00 17:46-18:11/25	06:50 15:36-16:23/47 17:12 16:23-16:32/9	07:26 09:06-10:02/56 16:46 15:27-16:08/41
2	05:44 06:41-07:12/31 20:58 19:52-20:31/39	06:10 06:45-07:14/29 20:38	06:43 18:06-18:44/38 19:51 18:44-19:00/16	07:15 17:22-18:27/65 18:59 17:58-18:36/38	06:51 15:35-16:22/47 17:10 16:22-16:31/9	07:27 09:06-10:02/56 16:46 15:28-16:09/41
3	05:45 06:40-07:12/32 20:58 19:52-20:31/39	06:11 06:46-07:13/27 20:37	06:44 18:05-18:35/30 19:49 18:34-19:01/27	07:16 17:21-18:17/56 18:57 18:14-18:34/20	06:53 15:34-16:22/48 17:09 16:22-16:31/9	07:29 09:06-10:03/57 16:45 15:29-16:09/40
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23	06:00 06:40-07:18/38 20:48 20:09	06:32 20:09	07:05 17:29-18:49/80 19:14	07:39 16:44-17:16/32 17:49-17:57/8 18:24 17:16-17:29/13	07:17 09:07-09:54/47 16:07-16:14/7 16:50 15:25-16:07/42	07:44 09:13-10:14/61 15:40-16:15/35 16:48 15:12-15:29/17
24	06:01 06:40-07:18/38 20:47 20:08	06:33 18:39-18:45/6 20:08	07:06 17:28-18:49/81 19:13	07:40 16:42-17:17/35 18:23 17:17-17:29/12	07:18 09:07-09:55/48 16:07-16:13/6 16:49 15:25-16:07/42	07:45 09:13-10:14/61 15:40-16:15/35 16:49 15:12-15:29/17
25	06:02 06:41-07:18/37 20:46 20:06	06:34 18:34-18:50/16 20:06	07:07 17:27-18:48/81 19:11	07:41 16:41-17:19/38 18:21 17:19-17:31/12	07:20 09:06-09:55/49 16:07-16:11/4 16:49 15:25-16:07/42	07:45 09:14-10:15/61 15:41-16:16/35 16:50 15:13-15:30/17
26	06:03 06:41-07:18/37 20:45 20:04	06:35 18:30-18:53/23 20:04	07:08 17:26-18:47/81 19:09	07:43 16:40-17:19/39 18:20 17:19-17:31/12	07:21 09:07-09:57/50 16:08-16:11/3 16:48 15:26-16:08/42	07:45 09:14-10:15/61 15:41-16:16/35 16:50 15:14-15:30/16
27	06:04 06:41-07:17/36 20:44 20:03	06:36 18:28-18:55/27 20:03	07:09 17:25-18:45/80 19:07	07:44 16:38-17:20/42 18:18 17:20-17:31/11	07:22 09:06-09:58/52 16:48 15:26-16:08/42	07:46 09:14-10:15/61 15:41-16:17/36 16:51 15:14-15:29/15
28	06:05 06:42-07:17/35 20:43 20:01	06:38 18:23-18:31/8 18:31-18:56/25	07:10 17:25-18:43/78 19:05 17:56-18:04/8	07:45 16:38-17:21/43 18:17 17:21-17:32/11	07:23 09:06-09:59/53 16:47 15:26-16:07/41	07:46 09:16-10:16/60 15:42-16:18/36 16:52 15:16-15:30/14
29	06:06 06:42-07:17/35 20:42 20:02	06:39 18:17-18:36/19 19:58 18:36-18:58/22	07:12 17:24-18:41/77 19:04 17:51-18:08/17	07:46 16:37-17:21/44 18:16 17:21-17:32/11	07:24 09:06-09:59/53 16:47 15:26-16:07/41	07:46 09:16-10:17/61 15:42-16:18/36 16:52 15:17-15:29/12
30	06:07 06:43-07:16/33 20:41 20:01	06:40 18:14-18:39/25 19:56 18:39-18:59/20	07:13 17:23-18:40/77 19:02 17:48-18:10/22	07:48 16:36-17:22/46 18:14 17:22-17:31/9	07:25 09:05-10:00/55 16:46 15:27-16:08/41	07:47 09:16-10:17/61 15:42-16:19/37 16:53 15:19-15:29/10
31	06:08 06:44-07:16/32 20:40 20:00	06:41 18:11-18:41/30 19:54 18:41-18:59/18	07:14 17:23-18:40/77 18:13 17:22-17:31/9	07:49 16:35-17:22/47 18:13 17:22-17:31/9	 	07:47 09:17-10:17/60 15:42-16:19/37 16:54 15:20-15:28/8
Potential sun hours	463	431	375	343	294	283
Sum of minutes with flicker	1594	403	2105	1840	2291	3278

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 11:06 AM / 14

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110**WTG:** 27 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (125)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

January		February		March		April		May		June	
1	07:47	07:32	16:00-16:44/44	06:54	16:54-17:07/13	07:01	18:29-18:59/30	06:14	19:00-19:30/30	05:43	06:06-06:15/9
	16:55	17:31		18:06	17:07-17:25/18	19:43		20:15	19:30-19:31/1	20:47	06:16-06:23/7
2	07:47	07:31	16:01-16:47/46	06:52	16:56-17:03/7	06:59	18:33-18:59/26	06:12	19:00-19:30/30	05:43	06:05-06:15/10
	16:56	17:32		18:08	17:04-17:25/21	19:44		20:16		20:47	06:18-06:20/2
3	07:47	07:30	16:02-16:49/47	06:51	17:04-17:26/22	06:58	18:33-18:59/26	06:11	19:01-19:29/28	05:42	06:05-06:16/11
	16:57	17:33		18:09		19:45		20:17	19:29-19:30/1	20:48	
4	07:47	07:29	16:01-16:49/48	06:49	17:03-17:26/23	06:56	18:32-18:58/26	06:10	19:02-19:29/27	05:42	06:04-06:15/11
	16:58	17:34		18:10		19:46		20:19	19:29-19:30/1	20:49	
5	07:47	07:28	16:02-16:51/49	06:48	17:02-17:25/23	06:54	18:33-18:59/26	06:08	06:29-06:31/2 19:29-19:30/1	05:42	06:04-06:16/12
	16:59	17:36		18:11		19:47		20:20	19:03-19:29/26	20:50	
6	07:47	07:26	16:03-16:52/49	06:46	17:03-17:25/22	06:53	18:33-18:57/24	06:07	06:27-06:31/4 19:28-19:29/1	05:41	06:04-06:17/13
	16:59	17:37		18:12		19:48	18:57-18:58/1	20:21	19:02-19:28/26	20:50	
7	07:47	07:25	16:04-16:53/49	06:44	17:03-17:25/22	06:51	18:33-18:56/23	06:06	06:26-06:29/3 19:03-19:28/25	05:41	06:04-06:17/13
	17:00	17:38		18:14		19:49		20:22	06:29-06:32/3	20:51	
8	07:47	07:24	16:06-16:54/48	07:43	18:03-18:23/20	06:49	18:34-18:55/21	06:04	06:25-06:30/5 19:04-19:28/24	05:41	06:03-06:17/14
	17:02	17:40		19:15		19:50	18:55-18:56/1	20:23	06:30-06:33/3	20:52	
9	07:47	07:23	16:07-16:53/46	07:41	18:03-18:22/19	06:48	18:35-18:52/17	06:03	06:24-06:31/7 19:05-19:27/22	05:40	06:03-06:17/14
	17:03	17:41		19:16		19:52	18:52-18:54/2	20:24	06:31-06:33/2	20:52	
10	07:46	07:22	16:09-16:54/45	07:39	18:05-18:21/16	06:46	18:36-18:48/12	06:02	06:23-06:31/8 19:06-19:26/20	05:40	06:03-06:17/14
	17:04	17:42		19:17		19:53	18:48-18:52/4	20:25	06:31-06:34/3	20:53	
11	07:46	07:20	16:12-16:54/42	07:38	18:07-18:18/11	06:44	18:38-18:50/12	06:01	06:22-06:32/10 19:08-19:24/16	05:40	06:03-06:18/15
	17:05	17:44		19:18		19:54	19:04-19:12/8	20:26	06:32-06:34/2	20:53	
12	07:46	07:19	16:24-16:54/30	07:36	18:11-18:13/2	06:43	19:00-19:14/14	06:00	06:21-06:32/11 19:10-19:23/13	05:40	06:03-06:18/15
	17:06	17:45		19:20		19:55		20:27	06:32-06:34/2	20:54	
13	07:45	16:09-16:14/5	07:18	16:25-16:54/29	07:34	06:41	18:58-19:15/17	05:59	06:20-06:32/12 19:16-19:19/3	05:40	06:03-06:18/15
	17:07	17:46		19:21		19:56		20:28	06:32-06:34/2	20:55	
14	07:45	16:06-16:17/11	07:16	16:25-16:54/29	07:32	06:39	18:57-19:17/20	05:58	06:19-06:33/14	05:40	06:03-06:19/16
	17:08	17:48		19:22		19:57		20:29	06:33-06:34/1	20:55	
15	07:45	16:05-16:20/15	07:15	16:25-16:53/28	07:31	06:38	18:55-19:17/22	05:57	06:18-06:33/15	05:40	06:03-06:19/16
	17:09	17:49	16:57-17:05/8	19:23		19:58		20:30	06:33-06:34/1	20:55	
16	07:44	16:03-16:21/18	07:14	16:26-16:53/27	07:29	06:36	18:54-19:17/23	05:56	06:17-06:33/16	05:40	06:03-06:19/16
	17:10	17:50	16:54-17:08/14	19:24		19:59		20:32		20:56	
17	07:44	16:02-16:22/20	07:12	16:26-17:09/43	07:27	06:34	18:54-19:18/24	05:55	06:16-06:32/16	05:40	06:03-06:19/16
	17:12	17:51		19:25		20:01		20:33	06:32-06:33/1	20:56	
18	07:43	16:02-16:24/22	07:11	16:28-17:10/42	07:26	06:33	18:53-19:19/26	05:54	06:15-06:32/17	05:40	06:03-06:19/16
	17:13	17:53		19:27		20:01		20:34	06:32-06:33/1	20:57	
19	07:43	16:01-16:25/24	07:09	16:29-16:49/20	07:24	06:31	18:53-19:19/26	05:53	06:14-06:32/18	05:40	06:03-06:19/16
	17:14	17:54	16:50-17:11/21	19:28		20:02	19:19-19:22/3	20:35		20:57	
20	07:42	16:01-16:27/26	07:08	16:31-16:48/17	07:22	06:30	18:52-19:19/27	05:52	06:13-06:31/18	05:40	06:03-06:19/16
	17:15	17:55	16:50-17:12/22	19:29		20:03	19:19-19:23/4	20:36		20:57	
21	07:41	16:00-16:28/28	07:06	16:33-16:45/12	07:20	06:28	18:53-19:23/30	05:51	06:12-06:31/19	05:40	06:03-06:19/16
	17:16	17:56	16:49-17:12/23	19:30		20:04	19:23-19:24/1	20:37		20:58	
22	07:41	16:00-16:28/28	07:05	16:49-17:12/23	07:19	06:27	18:52-19:24/32	05:50	06:12-06:31/19	05:40	06:04-06:20/16
	17:18	17:58		19:31		20:05		20:38		20:58	
23	07:40	15:59-16:29/30	07:03	16:48-17:12/24	07:17	06:25	18:53-19:26/33	05:49	06:11-06:30/19	05:41	06:04-06:20/16
	17:19	17:59		19:32		20:06		20:39		20:58	
24	07:39	15:59-16:29/30	07:02	16:49-17:12/23	07:15	06:24	18:53-19:27/34	05:48	06:10-06:29/19	05:41	06:04-06:20/16
	17:20	18:00		19:33		20:07		20:39		20:58	
25	07:38	16:00-16:31/31	07:00	16:49-17:11/22	07:13	06:22	18:54-19:28/34	05:48	06:09-06:28/19	05:41	06:04-06:20/16
	17:21	18:01		19:35		20:08		20:40		20:58	
26	07:37	16:00-16:31/31	06:59	16:50-17:12/22	07:12	06:21	18:54-19:29/35	05:47	06:09-06:29/20	05:42	06:05-06:21/16
	17:23	18:03	17:12-17:21/9	19:36		20:10		20:41		20:58	
27	07:37	15:59-16:32/33	06:57	16:50-17:11/21	07:10	06:19	18:56-19:30/34	05:46	06:08-06:28/20	05:42	06:05-06:21/16
	17:24	18:04	17:11-17:22/11	19:37		20:11		20:42		20:58	
28	07:36	15:59-16:32/33	06:56	16:51-17:09/18	07:08	06:18	18:58-19:30/32	05:46	06:08-06:28/20	05:42	06:06-06:22/16
	17:25	18:05	17:09-17:23/14	19:38		20:12	19:30-19:31/1	20:43		20:59	
29	07:35	16:00-16:33/33			07:06	06:16	18:59-19:30/31	05:45	06:07-06:26/19	05:43	06:06-06:21/15
	17:27				19:39	20:13		20:44		20:59	
30	07:34	16:00-16:33/33			07:05	06:15	19:00-19:30/30	05:44	06:07-06:26/19	05:43	06:06-06:21/15
	17:28				19:40	20:14	19:30-19:31/1	20:45		20:58	
31	07:33	16:00-16:33/33			07:03	06:14		06:06-06:24/18			
	17:29	16:36-16:40/4			19:41			20:46			
Potential sun hours		294		370		401		452		457	
Sum of minutes with flicker		488	1065	647		793		703		445	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 11:06 AM / 15

Licensed user:

EDR

217 Montgomery St.

US-SYRACUSE, NY 13202

(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110WTG: 27 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (125)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

July		August		September		October		November		December	
1	05:44 06:07-06:22/15	06:09 06:31-06:42/11 19:19-19:33/14	06:42 18:37-18:49/12	07:14	06:50 15:38-16:24/46	07:26					
	20:58	20:39 06:42-06:44/2	19:53 19:03-19:11/8	19:00	17:12	16:46					
2	05:44 06:07-06:22/15	06:10 06:32-06:41/9 19:17-19:35/18	06:43 18:35-18:47/12	07:15 17:47-17:56/9	06:51 15:36-16:23/47	07:27					
	20:58	20:38 06:41-06:43/2	19:51 18:47-18:51/4	18:58	17:10	16:46					
3	05:45 06:08-06:22/14	06:11 06:33-06:41/8 19:16-19:36/20	06:44 18:33-18:50/17	07:16 17:44-17:58/14	06:52 15:35-16:22/47	07:28					
	20:58	20:37 06:41-06:43/2	19:49 18:50-18:52/2	18:57	17:09	16:45					
4	05:45 06:09-06:23/14	06:12 06:34-06:40/6 19:14-19:37/23	06:45 18:31-18:52/21	07:17 17:42-17:59/17	06:54 15:34-16:22/48	07:29					
	20:58	20:36 06:40-06:43/3	19:48 18:52-18:53/1	18:55	17:08	16:45					
5	05:46 06:09-06:22/13	06:13 06:35-06:39/4 19:13-19:37/24	06:46 18:30-18:53/23	07:18 17:40-18:00/20	06:55 15:33-16:21/48	07:31					
	20:58	20:34 06:39-06:42/3	19:46	18:53	17:07	16:45					
6	05:47 06:10-06:23/13	06:14 06:36-06:38/2 19:12-19:38/26	06:47 18:29-18:54/25	07:19 17:39-18:00/21	06:56 15:32-16:20/48	07:31					
	20:58	20:33 06:38-06:42/4	19:44	18:52	17:05	16:45					
7	05:47 06:10-06:22/12	06:15 06:37-06:41/4 19:37-19:38/1	06:48 18:28-18:54/26	07:20 17:39-18:01/22	06:57 15:32-16:20/48	07:32					
	20:57	20:32 19:12-19:37/25	19:42	18:50	17:04	16:45					
8	05:48 06:11-06:23/12	06:16 06:38-06:40/2 19:38-19:39/1	06:49 18:27-18:53/26	07:21 17:38-18:01/23	06:59 15:31-16:18/47	07:33					
	20:57	20:31 19:11-19:38/27	19:41	18:48	17:03	16:45					
9	05:49 06:12-06:23/11	06:17 19:10-19:38/28	06:50 18:27-18:53/26	07:23 17:37-18:00/23	07:00 15:31-16:17/46	07:34					
	20:57	20:29 19:38-19:39/1	19:39	18:46	17:02	16:45					
10	05:49 06:12-06:22/10	06:18 19:10-19:38/28	06:51 18:26-18:53/27	07:24 17:37-18:00/23	07:01 15:31-16:15/44	07:35					
	20:56	20:28 19:38-19:39/1	19:37	18:45	17:01	16:45					
11	05:50 06:13-06:23/10	06:19 19:09-19:38/29	06:52 18:22-18:52/30	07:25 17:37-17:59/22	07:02 15:31-16:04/33	07:36					
	20:56	20:27 19:38-19:39/1	19:35	18:43	17:00	16:45					
12	05:51 06:14-06:32/18	06:20 19:08-19:38/30	06:53 18:18-18:51/33	07:26 17:28-17:39/11	07:04 15:31-16:04/33	07:37					
	20:55	20:25 19:38-19:39/1	19:34	18:41	17:39-17:58/19	16:59					
13	05:52 06:15-06:34/19	06:21 19:07-19:38/31	06:54 18:16-18:50/34	07:27 17:26-17:42/16	07:05 15:31-16:04/33	07:38					
	20:55	20:24	19:32	18:40	17:42-17:58/16	16:58					
14	05:52 06:15-06:34/19	06:23 19:07-19:37/30	06:55 18:14-18:49/35	07:28 17:24-17:43/19	07:06 15:31-16:04/33	07:39					
	20:54	20:22 19:37-19:38/1	19:30	18:38	17:43-17:56/13	16:57					
15	05:53 06:16-06:35/19	06:24 19:05-19:37/32	06:56 18:13-18:48/35	07:29 17:22-17:43/21	07:07 15:31-16:04/33	07:39					
	20:54	20:21	19:28	18:37	17:43-17:54/11	16:56					
16	05:54 06:17-06:37/20	06:25 19:02-19:36/34	06:58 18:11-18:46/35	07:31 17:21-17:44/23	07:09 15:33-16:04/31	07:40					
	20:53	20:20	19:27	18:35	17:44-17:51/7	16:55					
17	05:55 06:18-06:38/20	06:26 19:01-19:35/34	06:59 18:10-18:43/33	07:32 17:20-17:43/23	07:10 15:33-16:04/31	07:41					
	20:52	20:18	19:25	18:33	16:54	16:46					
18	05:56 06:19-06:39/20	06:27 19:00-19:34/34	07:00 18:10-18:38/28	07:33 17:20-17:44/24	07:11 15:33-16:03/30	07:41					
	20:52	20:17	19:23	18:32	16:53	16:46					
19	05:57 06:19-06:38/19	06:28 18:58-19:32/34	07:01 18:09-18:35/26	07:34 17:20-17:43/23	07:12 15:34-16:04/30	07:42					
	20:51	20:15	19:21	18:30	16:53	16:46					
20	05:57 06:20-06:39/19	06:29 18:58-19:30/32	07:02 18:09-18:34/25	07:35 17:07-17:13/6	07:14 15:35-16:03/28	07:43					
	20:50	20:14	19:20	18:29	17:20-17:43/23	16:52					
21	05:58 06:21-06:40/19	06:30 18:57-19:29/32	07:03 18:08-18:34/26	07:36 17:03-17:16/13	07:15 15:36-16:03/27	07:43					
	20:49	20:12	19:18	18:27	17:19-17:42/23	16:51					
22	05:59 06:22-06:41/19	06:31 18:57-19:27/30	07:04 18:08-18:33/25	07:38 17:01-17:19/18	07:16 15:37-16:03/26	07:44					
	20:49	20:11 19:27-19:29/2	19:16	18:26	17:20-17:42/22	16:50					
23	06:00 06:23-06:41/18	06:32 18:57-19:24/27	07:05 18:09-18:32/23	07:39 16:59-17:20/21	07:17 15:38-16:02/24	07:44					
	20:48	20:09 19:24-19:27/3	19:14	18:24	17:21-17:41/20	16:50					
24	06:01 06:24-06:42/18	06:33 18:57-19:23/26	07:06 18:09-18:30/21	07:40 16:57-17:40/43	07:18 15:39-16:01/22	07:45					
	20:47	20:07 19:23-19:25/2	19:12	18:23	16:49	16:49					
25	06:02 06:25-06:43/18	06:34 18:56-19:23/27	07:07 18:10-18:28/18	07:41 16:57-17:39/42	07:20 15:40-16:00/20	07:45					
	20:46	20:06	19:11	18:21	16:49	16:50					
26	06:03 06:26-06:43/17	06:35 18:56-19:21/25	07:08 18:11-18:26/15	07:43 16:56-17:23/27	07:21 15:42-16:00/18	07:45					
	20:45	20:04	19:09	18:20	17:24-17:37/13	16:48					
27	06:04 06:27-06:43/16	06:36 18:57-19:20/23	07:09 18:14-18:23/9	07:44 16:55-17:23/28	07:22 15:44-15:59/15	07:46					
	20:44	20:03	19:07	18:18	17:27-17:33/6	16:48					
28	06:05 06:28-06:43/15	06:37 18:57-19:19/22	07:10	07:45 16:54-17:23/29	07:23 15:46-15:57/11	07:46					
	20:43	20:01	19:05	18:17	16:47	16:52					
29	06:06 06:29-06:43/14	06:38 18:58-19:18/20	07:11	07:46 16:54-17:24/30	07:24 15:48-15:55/7	07:46					
	20:42	19:58	19:04	18:16	16:47	16:52					
30	06:07 06:30-06:43/13	06:40 18:59-19:16/17	07:13	07:47 16:44-16:50/6	07:25	07:46					
	20:41	19:56	19:02	18:14	16:54-17:24/30	16:46					
31	06:08 06:30-06:42/12 19:22-19:30/8	06:41 19:00-19:14/14		07:49 16:40-17:23/43		07:47					
	20:40	19:54		18:13		16:54					
	Potential sun hours	463	431	375	343	294	956	0			
	Sum of minutes with flicker	512	892	681	863	956					

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 11:06 AM / 16

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110**WTG:** 28 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (126)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:47 16:55	07:32 17:31	06:54 18:06	07:01 19:43	06:14 20:15	05:43 20:47	05:44 20:58	06:07-06:13/6 20:39	06:09 19:53	07:14 19:00	17:42-18:19/37 17:12	06:50 16:46
2	07:47 16:56	07:31 17:32	06:52 18:08	17:14-17:22/8 19:44	06:59 20:16	06:12 20:47	05:44 20:58	06:07-06:12/5 20:38	06:10 19:51	07:15 18:58	17:41-18:17/36 17:10	06:51 16:46
3	07:47 16:57	07:30 17:33	06:51 18:09	17:11-17:26/15 19:45	06:58 20:17	06:11 20:48	05:45 20:58	06:08-06:13/5 20:37	06:11 19:49	07:16 18:57	17:40-18:15/35 17:09	06:52 16:45
4	07:47 16:58	07:29 17:34	06:49 18:10	17:09-17:27/18 19:46	06:56 20:19	06:10 20:49	05:45 20:58	06:09-06:13/4 20:36	06:12 19:48	07:17 18:55	17:40-18:13/33 17:08	06:54 16:45
5	07:47 16:59	07:28 17:36	06:48 18:11	17:07-17:28/21 19:47	06:54 20:20	06:08 20:50	05:46 20:58	06:09-06:12/3 20:34	06:13 19:46	07:18 18:53	17:40-18:07/27 17:07	06:55 16:45
6	07:47 16:59	07:26 17:37	06:46 18:12	17:06-17:30/24 19:48	06:53 20:21	06:07 20:50	05:41 20:58	06:10-06:13/3 20:33	06:14 19:44	07:19 18:52	17:40-18:06/26 17:05	06:56 16:45
7	07:47 17:00	07:25 17:38	06:44 18:14	17:05-17:30/25 19:49	06:51 20:22	06:06 20:51	05:41 20:57	06:04-06:07/3 20:32	05:47 19:42	06:10-06:12/2 18:50	17:41-18:06/25 17:04	06:57 16:45
8	07:47 17:02	07:24 17:40	07:43 19:15	18:03-18:30/27 19:50	06:49 20:23	06:04 20:52	05:41 20:57	06:03-06:07/4 20:31	05:48 19:41	06:11-06:12/1 18:48	17:42-18:05/23 17:03	06:59 16:45
9	07:47 17:03	07:23 17:41	07:41 19:16	18:02-18:33/31 19:52	06:48 20:24	06:03 20:52	05:40 20:57	06:03-06:08/5 20:30	05:49 19:39	06:17 18:46	17:42-18:03/21 17:02	06:50 16:45
10	07:46 17:04	07:22 17:42	07:39 19:17	18:03-18:37/34 19:53	06:46 20:25	06:02 20:53	05:40 20:56	06:03-06:08/5 20:30	05:49 19:37	06:18 18:45	17:44-18:01/17 17:01	06:51 16:45
11	07:46 17:05	07:20 17:44	07:38 19:18	18:02-18:38/36 19:54	06:44 20:26	06:01 20:53	05:40 20:56	06:03-06:09/6 20:30	05:50 19:35	06:19 18:43	17:46-17:58/12 17:00	06:52 16:45
12	07:46 17:06	07:19 17:45	07:36 19:20	18:02-18:39/37 19:55	06:43 20:27	06:00 20:54	05:40 20:55	06:03-06:09/6 20:30	05:51 19:34	06:20 18:41	17:46-17:58/12 17:00	06:53 16:45
13	07:45 17:07	07:18 17:46	07:34 19:21	18:03-18:40/37 19:56	06:41 20:28	06:03 20:55	05:40 20:55	06:03-06:10/7 20:30	05:52 19:32	06:21 18:40	17:46-17:58/12 17:00	06:54 16:45
14	07:45 17:08	07:16 17:48	07:32 19:22	18:03-18:40/37 19:57	06:39 20:29	06:03 20:55	05:40 20:54	06:03-06:10/7 20:30	05:52 19:30	06:23 18:38	17:46-17:58/12 17:00	06:55 16:45
15	07:45 17:09	07:15 17:49	07:31 19:23	18:03-18:40/37 19:58	06:38 20:30	06:03 20:55	05:40 20:54	06:03-06:10/7 20:30	05:53 19:28	06:24 18:37	17:46-17:58/12 17:00	06:56 16:45
16	07:44 17:10	07:14 17:50	07:29 19:24	18:03-18:40/37 19:59	06:36 20:32	06:03 20:56	05:40 20:53	06:03-06:11/8 20:30	05:54 19:27	06:25 18:35	17:46-17:58/12 17:00	06:58 16:45
17	07:44 17:12	07:12 17:51	07:27 19:25	18:05-18:40/35 20:01	06:34 20:33	06:03 20:56	05:55 20:52	06:03-06:11/8 20:30	05:55 19:25	06:26 18:33	17:46-17:58/12 17:00	06:59 16:46
18	07:43 17:13	07:11 17:53	07:26 19:27	18:07-18:40/33 20:01	06:33 20:34	06:03 20:57	05:56 20:52	06:03-06:11/8 20:30	06:27 19:23	06:27 18:32	17:46-17:58/12 17:00	06:56 16:46
19	07:43 17:14	07:09 17:54	07:30-07:37/7 19:28	18:09-18:39/30 20:02	06:31 20:35	06:03 20:57	05:57 20:51	06:03-06:11/8 20:30	06:28 19:21	06:28 18:30	18:09-18:16/7 17:00	06:57 16:46
20	07:42 17:15	07:08 17:55	07:28-07:36/8 19:29	18:15-18:38/23 20:03	06:30 20:36	06:03 20:57	05:57 20:50	06:03-06:11/8 20:30	06:29 19:20	06:29 18:29	18:05-18:19/14 17:00	06:58 16:47
21	07:41 17:16	07:06 17:56	07:27-07:37/10 19:30	18:16-18:37/21 20:04	06:28 20:37	06:03 20:58	05:58 20:49	06:03-06:11/8 20:30	06:30 19:18	06:30 18:27	18:03-18:20/17 17:00	06:59 16:47
22	07:41 17:18	07:05 17:58	07:25-07:36/11 19:31	18:17-18:35/18 20:05	06:27 20:38	06:04 20:58	05:59 20:49	06:04-06:12/8 20:30	06:31 19:16	06:31 18:26	18:01-18:21/20 17:00	06:59 16:48
23	07:40 17:19	07:03 17:59	07:23-07:35/12 19:32	18:18-18:33/15 20:06	06:25 20:39	06:04 20:58	06:00 20:48	06:04-06:12/8 20:30	06:32 19:14	06:32 18:24	18:00-18:22/22 17:00	06:59 16:48
24	07:39 17:20	07:02 18:00	07:22-07:35/13 19:33	18:20-18:30/10 20:07	06:24 20:39	06:04 20:58	06:01 20:47	06:04-06:12/8 20:30	06:33 19:12	06:33 18:23	17:54-18:22/28 17:00	06:59 16:49
25	07:38 17:21	07:00 18:01	07:20-07:33/13 19:35	18:20-18:30/10 20:07	06:22 20:39	06:04 20:58	06:02 20:46	06:04-06:12/8 20:30	06:34 19:11	06:34 18:21	17:50-18:22/32 17:00	06:59 16:50
26	07:38 17:23	06:59 18:03	07:19-07:32/13 19:36	18:20-18:30/10 20:07	06:21 20:41	06:04 20:58	06:03 20:45	06:05-06:13/8 20:30	06:35 19:09	06:35 18:20	17:47-18:22/35 17:00	06:59 16:50
27	07:37 17:24	06:57 18:04	07:17-07:30/13 19:37	18:20-18:30/10 20:07	06:19 20:42	06:04 20:59	06:04 20:44	06:05-06:13/8 20:30	06:36 19:07	06:36 18:18	17:46-18:22/36 17:00	06:59 16:51
28	07:36 17:25	06:56 18:05	07:22-07:26/4 19:38	18:20-18:30/10 20:07	06:18 20:43	06:04 20:59	06:05 20:43	06:06-06:13/7 20:30	06:37 19:05	06:37 18:17	17:45-18:22/37 17:00	06:59 16:52
29	07:35 17:27	06:55 18:06	07:21-07:25/5 19:39	18:20-18:30/10 20:07	06:17 20:44	06:04 20:59	06:06 20:42	06:06-06:13/7 20:30	06:38 19:04	06:38 18:16	17:44-18:21/37 17:00	06:59 16:52
30	07:34 17:28	06:54 18:07	07:20-07:24/6 19:40	18:20-18:30/10 20:07	06:16 20:45	06:04 20:58	06:07 20:41	06:06-06:12/6 20:30	06:40 19:56	06:40 18:14	17:42-18:20/38 17:00	06:59 16:53
31	07:33 17:29	06:53 18:08	07:19-07:23/7 19:41	18:20-18:30/10 20:07	06:15 20:46	06:04 20:59	06:08 20:40	06:06-06:12/6 20:30	06:41 19:54	06:41 18:13	17:42-18:20/38 17:00	06:59 16:54
Potential sun hours	294	295	370	401	452	457	463	431	375	343	294	283
Sum of minutes with flicker	0	113	609	0	0	169	29	0	323	407	0	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

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(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110WTG: 29 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (127)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

January		February		March		April		May		June	
1	07:47 16:55	07:32 17:31	16:17-16:41/24	06:54 18:06		07:01 19:43	07:21-07:41/20 18:51-19:05/14	06:14 20:15	05:43 20:47		
2	07:47 16:56	07:31 17:32	16:17-16:41/24	06:52 18:08		06:59 19:44	07:19-07:39/20 18:50-19:07/17	06:12 20:16	05:43 20:47		
3	07:47 16:57	07:30 17:33	16:18-16:42/24	06:51 18:09		06:58 19:45	07:17-07:36/19 18:48-19:08/20	06:11 20:17	05:42 20:48		
4	07:47 16:58	07:29 17:34	16:17-16:41/24	06:49 18:10		06:56 19:46	07:15-07:32/17 18:46-19:08/22	06:10 20:19	05:42 20:49		
5	07:47 16:59	07:28 17:36	16:18-16:41/23	06:48 18:11		06:54 19:47	07:14-07:28/14 18:46-19:09/23	06:08 20:20	05:42 20:50		
6	07:47 16:59	07:26 17:37	16:19-16:41/22	06:46 18:12		06:53 19:48	07:12-07:27/15 18:45-19:09/24	06:07 20:21	05:41 20:50		
7	07:47 17:00	07:25 17:38	16:20-16:40/20	06:44 18:14		06:51 19:49	07:10-07:26/16 18:45-19:08/23	06:06 20:22	05:41 20:51		
8	07:47 17:02	07:24 17:40	16:21-16:40/19	07:43 19:15		06:49 19:50	07:09-07:25/16 18:45-19:09/24	06:04 20:23	05:41 20:52		
9	07:47 17:03	07:23 17:41	16:22-16:38/16	07:41 19:16		06:48 19:52	07:07-07:23/16 18:45-19:08/23	06:03 20:24	05:40 20:52		
10	07:46 17:04	07:22 17:42	16:24-16:36/12	07:39 19:17	07:59-08:00/1	06:46 19:53	07:08-07:21/13 18:45-19:07/22	06:02 20:25	05:40 20:53		
11	07:46 17:05	07:20 17:44	16:27-16:34/7	07:38 19:18	07:57-08:01/4	06:44 19:54	07:11-07:18/7 18:46-19:06/20	06:01 20:26	05:40 20:53		
12	07:46 17:06	07:19 17:45		07:36 19:20	07:55-08:02/7	06:43 19:55	18:46-19:05/19	06:00 20:27	05:40 20:54		
13	07:45 17:07	07:18 17:46		07:34 19:21	07:54-08:03/9	06:41 19:56	18:47-19:02/15	05:59 20:28	05:40 20:55		
14	07:45 17:08	07:16 17:48		07:32 19:22	07:52-08:03/11	06:39 19:57	18:49-19:01/12	05:58 20:29	05:40 20:55		
15	07:45 17:09	07:15 17:49		07:31 19:23	07:50-08:03/13	06:38 19:58	18:53-18:56/3	05:57 20:31	05:40 20:55		
16	07:44 17:10	07:14 17:50		07:29 19:24	07:49-08:04/15	06:36 19:59		05:56 20:32	05:40 20:56		
17	07:44 17:12	07:12 17:51		07:27 19:25	07:47-08:04/17	06:34 20:01		05:55 20:33	05:40 20:56		
18	07:43 17:13	07:11 17:53		07:26 19:27	07:45-08:03/18	06:33 20:01		05:54 20:34	05:40 20:57		
19	07:43 17:14	07:09 17:54		07:24 19:28	07:43-08:02/19	06:31 20:02		05:53 20:35	05:40 20:57		
20	07:42 17:15	07:08 17:55		07:22 19:29	07:42-08:03/21	06:30 20:03		05:52 20:36	05:40 20:57		
21	07:41 17:16	07:06 17:56		07:20 19:30	07:40-08:02/22	06:28 20:04		05:51 20:37	05:40 20:58		
22	07:41 17:18	16:25-16:28/3	07:05 17:58	07:19 19:31	07:38-08:00/22	06:27 20:05		05:50 20:38	05:40 20:58		
23	07:40 17:19	16:22-16:31/9	07:03 17:59	07:17 19:32	07:36-07:59/23	06:25 20:06		05:49 20:39	05:41 20:58		
24	07:39 17:20	16:20-16:33/13	07:02 18:00	07:15 19:33	07:34-07:57/23	06:24 20:07		05:48 20:40	05:41 20:58		
25	07:38 17:21	16:20-16:36/16	07:00 18:01	07:13 19:35	07:33-07:56/23	06:22 20:08		05:48 20:40	05:41 20:58		
26	07:38 17:23	16:19-16:37/18	06:59 18:03	07:12 19:36	07:31-07:53/22	06:21 20:10		05:47 20:41	05:42 20:58		
27	07:37 17:24	16:18-16:38/20	06:57 18:04	07:10 19:37	07:29-07:49/20	06:19 20:11		05:46 20:42	05:42 20:59		
28	07:36 17:25	16:18-16:39/21	06:56 18:05	07:08 19:38	07:28-07:45/17	06:18 20:12		05:46 20:43	05:42 20:59		
29	07:35 17:27	16:17-16:40/23		07:06 19:39	07:26-07:44/18	06:16 20:13		05:45 20:44	05:43 20:59		
30	07:34 17:28	16:17-16:40/23		07:05 19:40	07:24-07:43/19	06:15 20:14		05:44 20:45	05:43 20:59		
31	07:33 17:29	16:17-16:41/24		07:03 19:41	07:22-07:41/19 18:54-19:03/9			05:44 20:46			
Potential sun hours		294	295	370	370	401	452	457	0	0	
Sum of minutes with flicker		170	215	372	372	454	0	0			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

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217 Montgomery St.

US-SYRACUSE, NY 13202

(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110**WTG:** 29 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (127)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	July		August		September		October		November		December	
1	05:44	06:09			06:42	07:10-07:17/7	07:14	07:34-07:42/8	06:50	15:53-16:06/13	07:26	
	20:58	20:39			19:53	18:45-19:05/20	19:00		17:12		16:46	
2	05:44	06:10			06:43	07:07-07:20/13	07:15	07:35-07:40/5	06:51	15:51-16:08/17	07:27	
	20:58	20:38			19:51	18:44-19:06/22	18:58		17:10		16:46	
3	05:45	06:11			06:44	07:05-07:21/16	07:16	07:36-07:38/2	06:52	15:50-16:09/19	07:28	
	20:58	20:37			19:49	18:43-19:06/23	18:57		17:09		16:45	
4	05:45	06:12			06:45	07:06-07:22/16	07:17		06:54	15:49-16:10/21	07:30	
	20:58	20:36			19:48	18:42-19:06/24	18:55		17:08		16:45	
5	05:46	06:13			06:46	07:07-07:23/16	07:18		06:55	15:48-16:10/22	07:31	
	20:58	20:34			19:46	18:42-19:05/23	18:53		17:07		16:45	
6	05:47	06:14			06:47	07:08-07:23/15	07:19		06:56	15:48-16:11/23	07:32	
	20:58	20:33			19:44	18:41-19:05/24	18:52		17:05		16:45	
7	05:47	06:15			06:48	07:09-07:23/14	07:20		06:57	15:48-16:12/24	07:32	
	20:57	20:32			19:42	18:41-19:04/23	18:50		17:04		16:45	
8	05:48	06:16			06:49	07:10-07:27/17	07:21		06:59	15:47-16:12/25	07:33	
	20:57	20:31			19:41	18:41-19:03/22	18:48		17:03		16:45	
9	05:49	06:17			06:50	07:11-07:30/19	07:23		07:00	15:47-16:11/24	07:34	
	20:57	20:29			19:39	18:42-19:02/20	18:46		17:02		16:45	
10	05:49	06:18			06:51	07:12-07:32/20	07:24		07:01	15:48-16:12/24	07:35	
	20:56	20:28			19:37	18:43-19:01/18	18:45		17:01		16:45	
11	05:50	06:19			06:52	07:13-07:33/20	07:25		07:02	15:48-16:12/24	07:36	
	20:56	20:27			19:35	18:44-18:59/15	18:43		17:00		16:45	
12	05:51	06:20			06:53	07:14-07:33/19	07:26		07:04	15:48-16:11/23	07:37	
	20:55	20:25			19:34	18:46-18:56/10	18:41		16:59		16:45	
13	05:52	06:21			06:54	07:15-07:34/19	07:27		07:05	15:49-16:11/22	07:38	
	20:55	20:24			19:32		18:40		16:58		16:45	
14	05:52	06:23			06:55	07:16-07:34/18	07:28		07:06	15:50-16:11/21	07:39	
	20:54	20:22			19:30		18:38		16:57		16:45	
15	05:53	06:24			06:56	07:17-07:34/17	07:29		07:07	15:50-16:10/20	07:39	
	20:54	20:21			19:28		18:37		16:56		16:45	
16	05:54	06:25			06:58	07:18-07:38/20	07:31		07:09	15:52-16:10/18	07:40	
	20:53	20:20			19:27		18:35		16:55		16:45	
17	05:55	06:26			06:59	07:19-07:41/22	07:32		07:10	15:53-16:09/16	07:41	
	20:52	20:18			19:25		18:33		16:54		16:46	
18	05:56	06:27			07:00	07:20-07:43/23	07:33		07:11	15:54-16:07/13	07:41	
	20:52	20:17			19:23		18:32		16:53		16:46	
19	05:57	06:28			07:01	07:21-07:44/23	07:34		07:12	15:57-16:06/9	07:42	
	20:51	20:15			19:21		18:30		16:53		16:46	
20	05:57	06:29			07:02	07:22-07:45/23	07:35		07:14	16:00-16:03/3	07:43	
	20:50	20:14			19:20		18:29		16:52		16:47	
21	05:58	06:30			07:03	07:23-07:45/22	07:37		07:15		07:43	
	20:50	20:12			19:18		18:27		16:51		16:47	
22	05:59	06:31			07:04	07:24-07:46/22	07:38		07:16		07:44	
	20:49	20:11			19:16		18:26		16:50		16:48	
23	06:00	06:32			07:05	07:25-07:46/21	07:39		07:17		07:44	
	20:48	20:09			19:14		18:24		16:50		16:48	
24	06:01	06:33			07:06	07:26-07:46/20	07:40		07:18		07:45	
	20:47	20:07			19:12		18:23		16:49		16:49	
25	06:02	06:34			07:07	07:27-07:46/19	07:41		07:20		07:45	
	20:46	20:06			19:11		18:21		16:49		16:50	
26	06:03	06:35			07:08	07:29-07:46/17	07:43		07:21		07:45	
	20:45	20:04			19:09		18:20		16:48		16:50	
27	06:04	06:36			07:09	07:30-07:46/16	07:44		07:22		07:46	
	20:44	20:03			19:07		18:18		16:48		16:51	
28	06:05	06:37	18:54-18:58/4		07:10	07:31-07:45/14	07:45		07:23		07:46	
	20:43	20:01			19:05		18:17		16:47		16:52	
29	06:06	06:38	18:50-19:02/12		07:11	07:32-07:44/12	07:46		07:24		07:46	
	20:42	19:58			19:04		18:16		16:47		16:52	
30	06:07	06:40	18:48-19:04/16		07:13	07:33-07:43/10	07:47		07:25		07:47	
	20:41	19:56			19:02		18:14		16:46		16:53	
31	06:08	06:41	18:46-19:05/19				07:49	16:55-17:03/8			07:47	
	20:40	19:54					18:13				16:54	
Potential sun hours	463	431			375		343		294		283	
Sum of minutes with flicker	0	51			774		23		381		0	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 11:06 AM / 19

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Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

January		February		March		April		May		June	
1	07:47 09:08-10:17/69 16:55	07:32 08:15-09:17/62 17:31	06:54 07:27-08:17/50 18:06	07:01 07:25-07:56/31 19:43	06:14 06:39-07:52/73 20:15	05:43 06:17-06:41/24 20:47	06:41-06:52/11				
2	07:47 09:08-10:17/69 16:56	07:31 08:15-09:17/62 17:32	06:53 07:27-08:17/50 18:08	07:00 07:25-07:58/33 19:44	06:12 06:38-07:50/72 20:16	05:43 06:17-06:42/25 20:47	06:42-06:52/10				
3	07:47 08:34-08:39/5 16:57 09:09-10:17/68	07:30 08:15-09:18/63 17:33	06:51 07:27-08:18/51 18:09	06:58 07:25-08:00/35 19:45	06:11 06:38-07:48/70 20:17	05:42 06:16-06:44/28 20:48	06:44-06:53/9				
4	07:47 08:31-08:43/12 16:58 09:09-10:18/69	07:29 08:15-09:18/63 17:35	06:49 07:26-08:17/51 18:10	06:56 07:24-08:01/37 19:46	06:10 06:38-07:46/68 20:19	05:42 06:15-06:44/29 20:49	06:44-06:52/8				
5	07:47 08:30-08:45/15 16:59 09:10-10:18/68	07:28 08:14-09:17/63 17:36	06:48 07:25-08:17/52 18:11	06:54 07:23-08:03/40 19:47	06:08 06:38-07:26/48 20:20	05:42 06:15-06:45/30 20:50	06:45-06:52/7				
6	07:47 08:28-08:48/20 17:00 09:11-10:18/67	07:27 08:15-09:18/63 17:37	06:46 07:26-08:17/51 18:13	06:53 07:21-08:03/42 19:48	06:07 06:38-07:25/47 20:21	05:41 06:15-06:46/31 20:50	06:46-06:53/7				
7	07:47 08:27-08:50/23 17:01 09:12-10:19/67	07:25 08:15-09:18/63 17:38	06:44 07:25-08:17/52 18:14	06:51 07:20-08:04/44 19:49	06:06 06:38-07:25/47 20:22	05:41 06:14-06:47/33 20:51	06:47-06:53/6				
8	07:47 08:26-08:51/25 17:02 09:12-10:18/66	07:24 08:15-09:18/63 17:40	07:43 08:25-09:16/51 19:15	06:49 07:19-08:05/46 19:50	06:05 06:39-07:24/45 20:23	05:41 06:13-06:47/34 20:52	06:47-06:53/6				
9	07:47 08:25-08:53/28 17:03 09:13-10:18/65	07:23 08:15-09:17/62 17:41	07:41 08:25-09:16/51 19:16	06:48 07:18-08:05/47 19:52	06:03 06:40-07:24/44 20:24	05:40 06:13-06:48/35 20:52	06:48-06:53/5				
10	07:46 08:25-08:55/30 17:04 09:14-10:19/65	07:22 08:15-09:17/62 17:42	07:39 08:25-09:15/50 19:17	06:46 07:09-07:12/3 19:53	06:02 06:40-07:23/43 20:25	05:40 06:13-06:49/36 20:53	06:49-06:53/4				
11	07:46 08:23-08:56/33 17:05 09:14-10:18/64	07:20 08:16-09:17/61 17:44	07:38 08:25-09:14/49 19:18	06:44 07:05-08:06/61 19:54	06:01 06:41-07:23/42 20:26	05:40 06:13-06:49/36 20:53	06:49-06:54/5				
12	07:46 08:23-08:57/34 17:06 09:15-10:18/63	07:19 08:15-09:16/61 17:45	07:36 08:25-09:13/48 19:20	06:43 07:02-08:06/64 19:55	06:00 06:42-07:22/40 20:27	05:40 06:13-06:50/37 20:54	06:50-06:54/4				
13	07:45 08:23-08:59/36 17:07 09:16-10:19/63	07:18 08:16-09:16/60 17:46	07:34 08:26-09:13/47 19:21	06:41 07:00-08:05/65 19:56	05:59 06:29-06:38/9 20:28	05:40 06:13-06:50/37 20:55	06:50-06:54/4				
14	07:45 08:21-09:00/39 17:08 09:16-10:18/62	07:16 08:17-09:16/59 17:48	07:32 08:27-09:11/44 19:22	06:39 06:59-08:06/67 19:57	05:58 06:26-06:41/15 20:29	05:40 06:13-06:51/38 20:55	06:51-06:54/3				
15	07:45 08:21-09:02/41 17:09 09:17-10:18/61	07:15 08:17-09:15/58 17:49	07:31 08:27-09:09/42 19:23	06:38 06:58-08:05/67 19:58	05:57 06:24-06:43/19 20:31	05:40 06:13-06:51/38 20:56	06:51-06:54/3				
16	07:44 08:20-09:03/43 17:10 09:18-10:18/60	07:14 08:18-09:15/57 17:50	07:29 08:29-09:09/40 19:24	06:36 06:58-08:06/68 20:00	05:56 06:23-06:44/21 20:32	05:40 06:13-06:52/39 20:56	06:52-06:54/2				
17	07:44 08:20-09:05/45 17:12 09:19-10:18/59	07:12 07:47-07:59/12 17:51	07:27 08:29-09:07/38 19:25	06:34 06:57-08:05/68 20:00	05:55 06:21-06:45/24 20:33	05:40 06:13-06:52/39 20:56	06:52-06:55/3				
18	07:43 08:19-09:05/46 17:13 09:20-10:17/57	07:11 07:43-08:04/21 17:53	07:26 08:30-09:04/34 19:27	06:33 06:56-08:04/68 20:01	05:54 06:20-06:46/26 20:34	05:40 06:13-06:52/39 20:57	06:52-06:55/3				
19	07:43 08:19-09:06/47 17:14 09:21-10:16/55	07:09 07:41-08:07/26 17:54	07:24 08:32-09:02/30 19:28	06:31 06:55-08:04/69 20:02	05:53 06:19-06:47/28 20:35	05:40 06:13-06:52/39 20:57	06:52-06:55/3				
20	07:42 08:19-09:08/49 17:15 09:22-10:16/54	07:08 07:38-08:09/31 17:55	07:22 08:34-09:00/26 19:29	06:30 06:52-08:03/71 20:03	05:52 06:19-06:47/28 20:36	05:40 06:13-06:52/39 20:57	06:52-06:55/3				
21	07:41 08:18-09:09/51 17:16 09:23-10:15/52	07:06 07:37-08:11/34 17:57	07:20 08:37-08:56/19 19:30	06:28 06:51-08:03/72 20:04	05:51 06:18-06:48/30 20:37	05:40 06:13-06:52/39 20:58	06:52-06:55/3				
22	07:41 08:17-09:09/52 17:18 09:24-10:14/50	07:05 07:35-08:12/37 17:58	07:19 08:41-08:51/10 19:31	06:27 06:49-08:02/73 20:05	05:50 06:18-06:49/31 20:38	05:40 06:14-06:53/39 20:58	06:53-06:56/3				
23	07:40 08:17-09:10/53 17:19 09:25-10:13/48	07:03 07:33-08:13/40 17:59	07:17 07:36-07:45/9 19:32	06:25 06:47-08:01/74 20:06	05:49 06:18-06:49/31 20:39	05:41 06:14-06:53/39 20:58	06:53-06:56/3				
24	07:39 08:17-09:12/55 17:20 09:27-10:13/46	07:02 07:32-08:14/42 18:00	07:15 07:35-07:48/13 19:33	06:24 06:44-08:00/76 20:07	05:48 06:17-06:50/33 20:40	05:41 06:14-06:53/39 20:58	06:53-06:56/3				
25	07:38 08:17-09:12/55 17:22 09:29-10:11/42	07:00 07:30-08:15/45 18:02	07:13 07:33-07:49/16 19:35	06:22 06:43-08:00/77 20:09	05:48 06:16-06:50/34 20:40	05:41 06:14-06:53/39 20:58	06:53-06:56/3				
26	07:38 08:16-09:13/57 17:23 09:30-10:10/40	06:59 07:30-08:16/46 18:03	07:12 07:31-07:50/19 19:36	06:21 06:42-07:59/77 20:10	05:47 06:17-06:51/34 20:41	05:42 06:15-06:54/39 20:58	06:54-06:57/3				
27	07:37 08:16-09:14/58 17:24 09:32-10:08/36	06:57 07:29-08:16/47 18:04	07:10 07:29-07:50/21 19:37	06:19 06:41-07:57/76 20:11	05:46 06:16-06:51/35 20:42	05:42 06:15-06:53/38 20:59	06:53-06:56/3				
28	07:36 08:16-09:14/58 17:25 09:34-10:06/32	06:56 07:29-08:17/48 18:05	07:08 07:28-07:51/23 19:38	06:18 06:40-07:57/77 20:12	05:46 06:17-06:32/15 20:43	05:42 06:16-06:54/38 20:59	06:54-06:57/3				
29	07:35 08:15-09:15/60 17:27 09:37-10:04/27		07:06 07:26-07:51/25 19:39	06:16 06:39-07:55/76 20:13	05:45 06:16-06:35/19 20:44	05:43 06:16-06:54/38 20:59	06:54-06:57/3				
30	07:34 08:15-09:16/61 17:28 09:40-10:00/20		07:05 07:25-07:51/26 19:40	06:15 06:39-07:54/75 20:14	05:44 06:17-06:38/21 20:45	05:43 06:16-06:53/37 20:59	06:53-06:58/5				
31	07:33 08:15-09:16/61 17:29 09:46-09:55/9		07:03 07:25-07:52/27 19:41		05:44 06:17-06:40/23 20:46						
Potential sun hours		294				457					
Sum of minutes with flicker		2865	1894	1115	1828	1446	1209				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
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Project:

2015-08-31_Arkwright Summit_SFA

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	20:58	06:54-06:58/4	20:39		19:53		19:00		17:12		16:46	08:56-10:00/64
2	05:44	06:17-06:53/36	06:10	06:51-07:33/42	06:43	07:08-07:11/3	07:15	08:04-08:52/48	06:51	07:44-08:47/63	07:27	08:08-08:38/30
	20:58	06:53-06:58/5	20:38		19:51	07:15-08:04/49	18:58		17:10		16:46	08:57-10:02/65
3	05:45	06:18-06:53/35	06:11	06:50-07:33/43	06:44	07:16-08:03/47	07:16	08:03-08:53/50	06:52	07:44-08:47/63	07:29	08:09-08:37/28
	20:58	06:53-06:58/5	20:37		19:49		18:57		17:09		16:45	08:57-10:02/65
4	05:45	06:19-06:53/34	06:12	06:49-07:34/45	06:45	07:16-08:02/46	07:17	08:02-08:53/51	06:54	07:45-08:48/63	07:30	08:11-08:36/25
	20:58	06:53-06:59/6	20:36		19:48		18:55		17:08		16:45	08:57-10:03/66
5	05:46	06:19-06:53/34	06:13	06:48-07:34/46	06:46	07:17-08:01/44	07:18	08:02-08:53/51	06:55	07:44-08:47/63	07:31	08:12-08:35/23
	20:58	06:53-06:58/5	20:34		19:46		18:53		17:07		16:45	08:57-10:04/67
6	05:47	06:21-06:53/32	06:14	06:48-07:34/46	06:47	07:17-07:59/42	07:19	08:02-08:53/51	06:56	07:45-08:48/63	07:32	08:14-08:34/20
	20:58	06:53-06:59/6	20:33		19:44		18:52		17:05		16:45	08:57-10:04/67
7	05:47	06:21-06:52/31	06:15	06:47-07:35/48	06:48	07:18-07:58/40	07:20	08:01-08:53/52	06:57	07:45-08:48/63	07:33	08:16-08:32/16
	20:57	06:52-06:59/7	20:32	07:38-07:50/12	19:42		18:50		17:04		16:45	08:57-10:05/68
8	05:48	06:22-06:51/29	06:16	06:47-07:53/66	06:49	07:19-07:56/37	07:21	08:01-08:53/52	06:59	07:45-08:47/62	07:33	08:19-08:31/12
	20:57	06:51-06:59/8	20:31		19:41		18:48		17:03		16:45	08:57-10:06/69
9	05:49	06:23-06:51/28	06:17	06:47-07:56/69	06:50	07:19-07:54/35	07:23	08:01-08:52/51	07:00	07:46-08:48/62	07:34	08:23-08:28/5
	20:57	06:51-07:00/9	20:29		19:39		18:46		17:02		16:45	08:58-10:06/68
10	05:49	06:23-06:50/27	06:18	06:47-07:58/71	06:51	07:18-07:52/34	07:24	08:00-08:52/52	07:01	07:46-08:47/61	07:35	08:58-10:07/69
	20:56	06:50-06:59/9	20:28		19:37		18:45		17:01		16:45	
11	05:50	06:24-06:49/25	06:19	06:47-07:59/72	06:52	07:18-07:49/31	07:25	08:00-08:51/51	07:03	07:46-08:47/61	07:36	08:58-10:07/69
	20:56	06:49-07:00/11	20:27		19:36		18:43		17:00	09:16-09:26/10	16:45	
12	05:51	06:25-06:48/23	06:20	06:47-08:01/74	06:53	07:17-07:45/28	07:26	08:01-08:51/50	07:04	07:47-08:47/60	07:37	08:58-10:08/70
	20:55	06:48-07:00/12	20:25		19:34		18:42		16:59	09:12-09:32/20	16:45	
13	05:52	06:25-06:47/22	06:22	06:48-08:02/74	06:54	07:17-07:38/21	07:27	08:01-08:50/49	07:05	07:47-08:47/60	07:38	08:59-10:08/69
	20:55	06:47-07:00/13	20:24		19:32	07:38-07:42/4	18:40		16:58	09:08-09:36/28	16:45	
14	05:52	06:25-06:45/20	06:23	06:48-08:03/75	06:55	07:16-07:41/25	07:28	08:01-08:50/49	07:06	07:48-08:46/58	07:39	08:59-10:09/70
	20:54	06:45-07:00/15	20:23		19:30		18:38	09:07-09:26/19	16:57	09:06-09:38/32	16:45	
15	05:53	06:25-06:43/18	06:24	06:48-08:05/77	06:57	07:17-07:41/24	07:29	08:01-08:48/47	07:07	07:49-08:47/58	07:39	09:00-10:10/70
	20:54	06:43-07:00/17	20:21		19:28		18:37	09:03-09:29/26	16:56	09:05-09:41/36	16:45	
16	05:54	06:26-07:00/34	06:25	06:49-08:05/76	06:58	07:18-07:40/22	07:31	08:02-08:47/45	07:09	07:49-08:46/57	07:40	09:00-10:10/70
	20:53		20:20		19:27		18:35	09:00-09:32/32	16:55	09:03-09:43/40	16:46	
17	05:55	06:26-07:00/34	06:26	06:49-08:06/77	06:59	07:19-07:38/19	07:32	08:03-08:47/44	07:10	07:50-08:45/55	07:41	09:00-10:11/71
	20:52		20:18		19:25		18:33	08:59-09:35/36	16:54	09:02-09:44/42	16:46	
18	05:56	06:27-07:00/33	06:27	06:50-08:06/76	07:00	07:20-07:37/17	07:33	08:04-08:46/42	07:11	07:51-08:46/55	07:41	09:01-10:11/70
	20:52		20:17		19:23		18:32	08:56-09:36/40	16:53	09:01-09:47/46	16:46	
19	05:57	06:26-06:59/33	06:28	06:51-08:07/76	07:01	07:21-07:35/14	07:34	08:05-08:44/39	07:12	07:52-08:45/53	07:42	09:01-10:11/70
	20:51		20:15		19:21		18:30	08:55-09:38/43	16:53	09:00-09:48/48	16:47	
20	05:57	06:27-06:59/32	06:29	06:53-08:07/74	07:02	07:22-07:32/10	07:35	08:06-08:42/36	07:14	07:52-08:44/52	07:43	09:02-10:12/70
	20:50		20:14		19:20		18:29	08:53-09:39/46	16:52	08:59-09:49/50	16:47	
21	05:58	06:27-06:59/32	06:30	06:55-08:08/73	07:03	08:29-08:33/4	07:37	08:08-08:41/33	07:15	07:53-08:44/51	07:43	09:02-10:12/70
	20:50		20:12		19:18		18:27	08:52-09:41/49	16:51	08:58-09:50/52	16:47	
22	05:59	06:28-06:59/31	06:31	06:56-08:08/72	07:04	08:22-08:40/18	07:38	08:09-08:39/30	07:16	07:55-08:44/49	07:44	09:03-10:13/70
	20:49	07:09-07:19/10	20:11		19:16		18:26	08:51-09:41/50	16:50	08:58-09:52/54	16:48	
23	06:00	06:29-06:58/29	06:32	06:57-08:08/71	07:05	08:18-08:43/25	07:39	08:11-08:36/25	07:17	07:56-08:43/47	07:44	09:03-10:13/70
	20:48	07:07-07:22/15	20:09		19:14		18:24	08:49-09:42/53	16:50	08:58-09:53/55	16:48	
24	06:01	06:30-06:58/28	06:33	06:59-08:08/69	07:06	08:16-08:45/29	07:40	08:14-08:32/18	07:18	07:56-08:42/46	07:45	09:03-10:13/70
	20:47	07:05-07:24/19	20:07		19:13		18:23	08:48-09:43/55	16:49	08:57-09:54/57	16:49	
25	06:02	06:30-06:57/27	06:34	07:00-08:08/68	07:07	08:13-08:46/33	07:41	08:20-08:28/8	07:20	07:57-08:42/45	07:45	09:04-10:14/70
	20:46	07:03-07:26/23	20:06		19:11		18:21	08:48-09:44/56	16:49	08:56-09:55/59	16:50	
26	06:03	06:31-06:56/25	06:35	07:00-08:08/68	07:08	08:12-08:49/37	07:43	08:47-09:45/58	07:21	07:59-08:42/43	07:45	09:04-10:15/71
	20:45	07:02-07:27/25	20:04		19:09		18:20		16:48	08:57-09:57/60	16:50	
27	06:04	06:32-06:55/23	06:36	07:00-08:07/67	07:09	08:10-08:50/40	07:44	08:46-09:45/59	07:22	08:00-08:41/41	07:46	09:05-10:15/70
	20:44	07:01-07:28/27	20:03	07:09-07:12/3	19:07		18:18		16:48	08:57-09:57/60	16:51	
28	06:05	06:34-06:54/20	06:37	07:00-08:07/67	07:10	08:09-08:51/42	07:45	08:46-09:46/60	07:23	08:01-08:40/39	07:46	09:06-10:16/70
	20:43	07:00-07:30/30	20:01		19:05		18:17		16:47	08:56-09:58/62	16:52	
29	06:06	06:35-06:53/18	06:39	07:00-08:07/67	07:12	08:07-08:51/44	07:46	08:46-09:46/60	07:24	08:03-08:39/36	07:46	09:06-10:16/70
	20:42	06:57-07:31/34	19:58		19:04		18:16		16:47	08:56-09:59/63	16:52	
30	06:07	06:38-06:50/12	06:40	07:01-08:06/65	07:13	08:06-08:52/46	07:47	08:45-09:46/61	07:25	08:04-08:39/35	07:47	09:07-10:16/69
	20:41	06:55-07:31/36	19:56		19:02		18:14		16:46	08:56-09:59/63	16:53	
31	06:08	06:41-06:47/6	06:41	07:02-08:06/64			07:49	08:44-09:46/62			07:47	09:07-10:16/69
	20:40	06:54-07:32/38	19:54				18:13				16:54	
Potential sun hours	463		431		375		343		294		283	
Sum of minutes with flicker	1237		2029		971		1936		2563		2328	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 11:06 AM / 21

Licensed user:

EDR

217 Montgomery St.

US-SYRACUSE, NY 13202

(315) 471 0688

Jacob Runner / jrunner@edrdoc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110**WTG:** 32 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (121)**Assumptions for shadow calculations**

Sunshine probability S/50 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

January	February	March	April	May	June
---------	----------	-------	-------	-----	------

1	07:47	08:10-08:45/35	07:32	07:53-08:16/23	06:54	07:30-07:44/14	07:01	07:21-07:55/34	06:14	05:43
	16:55		17:31	08:16-08:22/6	18:06		19:43		20:15	20:47
2	07:47	08:10-08:46/36	07:31	07:52-08:16/24	06:53	07:12-07:16/4	06:59	07:19-07:54/35	06:12	05:43
	16:56		17:32	08:16-08:22/6	18:08	07:34-07:39/5	19:44		20:16	20:47
3	07:47	08:10-08:46/36	07:30	07:51-08:16/25	06:51	07:11-07:19/8	06:58	07:19-07:53/34	06:11	05:42
	16:57		17:33	08:16-08:22/6	18:09		19:45		20:17	20:48
4	07:47	08:10-08:46/36	07:29	07:50-08:16/26	06:49	07:09-07:20/11	06:56	07:19-07:51/32	06:10	05:42
	16:58		17:34	08:16-08:23/7	18:10		19:46		20:19	20:49
5	07:47	08:11-08:46/35	07:28	07:48-08:15/27	06:48	07:07-07:21/14	06:54	07:20-07:51/31	06:08	05:42
	16:59		17:36	08:15-08:22/7	18:11		19:47		20:20	20:50
6	07:47	08:12-08:46/34	07:27	07:47-08:14/27	06:46	07:06-07:13/7	06:53	07:20-07:49/29	06:07	05:41
	16:59		17:37	08:14-08:21/7	18:12	07:13-07:23/10	19:48		20:21	20:50
7	07:47	08:12-08:46/34	07:25	07:46-08:14/28	06:44	07:04-07:16/12	06:51	07:10-07:14/4	06:06	05:41
	17:00		17:38	08:14-08:21/7	18:14	07:16-07:23/7	19:49	07:21-07:48/27	20:22	20:51
8	07:47	08:12-08:44/32	07:24	07:45-08:13/28	07:43	08:02-08:17/15	06:49	07:09-07:16/7	06:04	05:41
	17:02		17:40	08:13-08:21/8	19:15	08:17-08:23/6	19:50	07:23-07:46/23	20:23	20:52
9	07:47	08:13-08:44/31	07:23	07:43-08:11/28	07:41	08:01-08:19/18	06:48	07:07-07:17/10	06:03	05:40
	17:03		17:41	08:11-08:19/8	19:16	08:19-08:24/5	19:52	07:24-07:44/20	20:24	20:52
10	07:46	08:14-08:44/30	07:22	07:42-07:45/3	07:39	07:59-08:20/21	06:46	07:05-07:17/12	06:02	05:40
	17:04		17:42	07:45-08:18/33	19:17	08:20-08:23/3	19:53	07:26-07:41/15	20:25	20:53
11	07:46	08:14-08:43/29	07:20	07:41-07:48/7	07:38	07:57-08:21/24	06:44	07:04-07:18/14	06:01	05:40
	17:05		17:44	07:48-08:17/29	19:18	08:21-08:23/2	19:54	07:31-07:36/5	20:26	20:53
12	07:46	08:14-08:44/30	07:19	07:39-07:49/10	07:36	07:55-08:21/26	06:43	07:02-07:18/16	06:00	05:40
	17:06		17:45	07:49-08:15/26	19:20	08:21-08:22/1	19:55		20:27	20:54
13	07:45	08:15-08:45/30	07:18	07:38-07:51/13	07:34	07:54-08:22/28	06:41	07:00-07:18/18	05:59	05:40
	17:07		17:46	07:51-08:13/22	19:21		19:56		20:28	20:55
14	07:45	08:16-08:44/28	07:16	07:37-07:52/15	07:32	07:52-08:21/29	06:39	06:59-07:19/20	05:58	05:40
	17:08		17:48	07:52-08:11/19	19:22		19:57		20:29	20:55
15	07:45	08:17-08:45/28	07:15	07:35-07:53/18	07:31	07:50-08:20/30	06:38	06:57-07:18/21	05:57	05:40
	17:09		17:49	07:53-08:10/17	19:23		19:58		20:31	20:56
16	07:44	08:17-08:44/27	07:14	07:34-07:54/20	07:29	07:49-08:21/32	06:36	06:56-07:18/22	05:56	05:40
	17:10		17:50	07:54-08:10/16	19:24		19:59		20:32	20:56
17	07:44	08:19-08:45/26	07:12	07:32-07:54/22	07:27	07:47-08:20/33	06:34	06:54-07:18/24	05:55	05:40
	17:12		17:51	07:54-08:08/14	19:25		20:01		20:33	20:56
18	07:43	08:05-08:08/3	07:11	07:31-07:55/24	07:26	07:45-08:19/34	06:33	06:52-07:17/25	05:54	05:40
	17:13		17:13	08:19-08:44/25	19:27		20:01		20:34	20:57
19	07:43	08:04-08:10/6	07:09	07:30-07:55/25	07:24	07:43-08:19/36	06:31	06:51-07:16/25	05:53	05:40
	17:14		17:14	08:20-08:43/23	19:28		20:02		20:35	20:57
20	07:42	08:04-08:12/8	07:08	07:28-07:55/27	07:22	07:42-07:50/8	06:30	06:49-07:15/26	05:52	05:40
	17:15		17:15	08:22-08:43/21	19:29	07:49-08:18/29	20:03		20:36	20:57
21	07:41	08:03-08:14/11	07:06	07:27-07:55/28	07:20	07:40-07:52/12	06:28	06:48-07:15/27	05:51	05:40
	17:16		17:16	08:23-08:42/19	19:30	07:51-08:17/26	20:04		20:37	20:58
22	07:41	08:02-08:15/13	07:05	07:25-07:53/28	07:19	07:38-07:54/16	06:27	06:48-07:13/25	05:50	05:40
	17:18		17:18	08:24-08:41/17	19:31	07:53-08:16/23	20:05		20:38	20:58
23	07:40	08:01-08:16/15	07:03	07:24-07:53/29	07:17	07:36-07:55/19	06:25	06:49-07:12/23	05:49	05:41
	17:19		17:19	08:26-08:39/13	19:32	07:54-08:14/20	20:06		20:39	20:58
24	07:39	08:01-08:18/17	07:02	07:24-07:52/28	07:15	07:35-07:56/21	06:24	06:50-07:10/20	05:48	05:41
	17:20		17:20	08:29-08:38/9	19:33	07:55-08:13/18	20:07		20:40	20:58
25	07:38	08:00-08:12/12	07:00	07:25-07:51/26	07:13	07:33-07:57/24	06:22	06:52-07:09/17	05:48	05:41
	17:21		17:21	08:12-08:18/6	19:35	07:56-08:11/15	20:09		20:40	20:58
26	07:38	07:59-08:13/14	06:59	07:26-07:50/24	07:12	07:31-07:57/26	06:21	06:54-07:07/13	05:47	05:42
	17:23		17:23	08:13-08:19/6	19:36	07:56-08:08/12	20:10		20:41	20:58
27	07:37	07:58-08:14/16	06:57	07:27-07:48/21	07:10	07:29-07:56/27	06:19		20:46	05:42
	17:24		17:24	08:14-08:20/6	19:37	07:56-08:03/7	20:11		20:42	20:59
28	07:36	07:57-08:14/17	06:56	07:29-07:47/18	07:08	07:28-07:57/29	06:18		20:46	05:42
	17:25		17:25	08:14-08:20/6	19:38	07:57-07:59/2	20:12		20:43	20:59
29	07:35	07:56-08:15/19			07:06	07:26-07:56/30	06:16		20:45	05:43
	17:27		17:27	08:15-08:21/6	19:39	07:56-07:57/1	20:13		20:44	20:59
30	07:34	07:55-08:15/20			07:05	07:24-07:55/31	06:15		20:44	05:43
	17:28		17:28	08:15-08:21/6	19:40		20:14		20:45	20:59
31	07:33	07:54-08:16/22			07:03	07:22-07:54/32			20:44	
	17:29		17:29	08:16-08:22/6	19:41				20:46	
Potential sun hours			294				401		452	457
Sum of minutes with flicker			901	295	898	856	654	0	0	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

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Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110**WTG:** 32 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (121)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	July		August		September		October		November		December	
1	05:44	06:09	06:42	07:03-07:17/14	07:14	07:34-08:01/27	06:50	07:12-07:14/2	07:26	07:56-08:25/29		
	20:58	20:39	19:53	07:30-07:35/5	19:00	08:01-08:02/1	17:12	07:14-07:48/34	16:46	08:25-08:27/2		
2	05:44	06:10	06:43	07:04-07:16/12	07:15	07:35-07:59/24	06:51	07:13-07:41/28	07:27	07:57-08:27/30		
	20:58	20:38	19:51	07:25-07:40/15	18:58	07:59-08:02/3	17:10	07:41-07:49/8		16:46		
3	05:45	06:11	06:44	07:05-07:15/10	07:16	07:36-07:58/22	06:52	07:15-07:43/28	07:29	07:57-08:28/31		
	20:58	20:37	19:49	07:22-07:42/20	18:57	07:58-08:01/3	17:09	07:43-07:51/8		16:45		
4	05:45	06:12	06:45	07:06-07:13/7	07:17	07:37-07:57/20	06:54	07:16-07:44/28	07:30	07:57-08:29/32		
	20:58	20:36	19:48	07:20-07:43/23	18:55	07:57-08:01/4	17:08	07:44-07:51/7		16:45		
5	05:46	06:13	06:46	07:07-07:11/4	07:18	07:38-07:55/17	06:55	07:17-07:44/27	07:31	07:57-08:31/34		
	20:58	20:34	19:46	07:18-07:45/27	18:53	07:55-08:00/5	17:07	07:44-07:51/7		16:45		
6	05:47	06:14	06:47	07:16-07:45/29	07:19	07:40-07:54/14	06:56	07:19-07:46/27	07:32	07:58-08:32/34		
	20:58	20:33	19:44		18:52	07:54-08:00/6	17:05	07:46-07:52/6		16:45		
7	05:47	06:15	06:48	07:15-07:46/31	07:20	07:41-07:51/10	06:57	07:20-07:46/26	07:33	07:58-08:33/35		
	20:57	20:32	19:42		18:50	07:51-07:59/8	17:04	07:46-07:52/6		16:45		
8	05:48	06:16	06:49	07:14-07:46/32	07:21	07:42-07:46/4	06:59	07:21-07:46/25	07:33	07:58-08:34/36		
	20:57	20:31	19:41		18:48	07:46-07:57/11	17:03	07:46-07:52/6		16:45		
9	05:49	06:17	06:50	07:13-07:47/34	07:23	07:43-07:56/13	07:00	07:23-07:47/24	07:34	07:59-08:35/36		
	20:57	20:29	19:39		18:46		17:02	07:47-07:53/6		16:45		
10	05:49	06:18	06:51	07:12-07:47/35	07:24	07:44-07:54/10	07:01	07:24-07:47/23	07:35	08:00-08:36/36		
	20:56	20:28	19:37		18:45		17:01	07:47-07:53/6		16:45		
11	05:50	06:19	06:52	07:13-07:47/34	07:25	07:45-07:51/6	07:03	07:25-07:46/21	07:36	08:00-08:35/35		
	20:56	20:27	19:35		18:43		17:00	07:46-07:53/7		16:45		
12	05:51	06:20	06:53	07:14-07:46/32	07:26	07:47-07:49/2	07:04	07:27-07:47/20	07:37	08:01-08:36/35		
	20:55	20:25	19:34		18:41	08:06-08:16/10	16:59	07:47-07:53/6		16:45		
13	05:52	06:21	06:54	07:15-07:46/31	07:27	08:03-08:19/16	07:05	07:28-07:47/19	07:38	08:02-08:37/35		
	20:55	20:24	19:32		18:40		16:58	07:47-07:53/6		16:45		
14	05:52	06:23	06:55	07:16-07:47/31	07:28	08:00-08:20/20	07:06	07:29-07:46/17	07:39	08:03-08:38/35		
	20:54	20:23	19:30		18:38		16:57	07:46-07:52/6		16:45		
15	05:53	06:24	06:56	07:17-07:46/29	07:29	07:59-08:21/22	07:07	07:31-07:47/16	07:39	08:04-08:39/35		
	20:54	20:21	19:28	07:46-07:48/2	18:37		16:56	07:47-07:53/6		16:45		
16	05:54	06:25	06:58	07:18-07:45/27	07:31	07:57-08:22/25	07:09	07:32-07:46/14	07:40	08:04-08:39/35		
	20:53	20:20	19:27	07:45-07:50/5	18:35		16:55	07:46-07:52/6		16:45		
17	05:55	06:26	06:59	07:19-07:45/26	07:32	07:57-08:24/27	07:10	07:33-07:45/12	07:41	08:05-08:40/35		
	20:52	20:18	19:25	07:44-07:55/11	18:33		16:54	07:45-07:51/6		16:46		
18	05:56	06:27	07:00	07:20-07:44/24	07:33	07:56-08:24/28	07:11	07:35-07:52/17	07:41	08:06-08:41/35		
	20:52	20:17	19:23	07:43-07:58/15	18:32		16:53	08:03-08:12/9		16:46		
19	05:57	06:28	07:01	07:21-07:43/22	07:34	07:55-08:24/29	07:12	07:36-07:51/15	07:42	08:06-08:41/35		
	20:51	20:15	19:21	07:42-07:59/17	18:30		16:53	08:01-08:14/13		16:46		
20	05:57	06:29	07:02	07:22-07:41/19	07:35	07:56-08:25/29	07:14	07:37-07:50/13	07:43	08:07-08:42/35		
	20:50	20:14	19:20	07:40-08:00/20	18:29	08:25-08:28/3	16:52	07:59-08:16/17		16:47		
21	05:58	06:30	07:03	07:23-07:39/16	07:37	07:58-08:26/28	07:15	07:38-07:49/11	07:43	08:07-08:42/35		
	20:50	20:12	19:18	07:38-08:01/23	18:27	08:26-08:33/7	16:51	07:58-07:17/19		16:47		
22	05:59	06:31	07:04	07:24-07:37/13	07:38	07:59-08:25/26	07:16	07:40-07:48/8	07:44	08:08-08:43/35		
	20:49	20:11	19:16	07:36-08:01/25	18:26	08:25-08:35/10	16:50	07:58-08:19/21		16:48		
23	06:00	06:32	07:05	07:25-07:34/9	07:39	08:00-08:25/25	07:17	07:41-07:47/6	07:44	08:08-08:43/35		
	20:48	20:09	19:14	07:33-08:02/29	18:24	08:25-08:36/11	16:50	07:57-08:20/23		16:48		
24	06:01	06:33	07:06	07:26-07:28/2	07:40	08:01-08:24/23	07:18	07:42-07:45/3	07:45	08:08-08:44/36		
	20:47	20:07	19:12	07:28-08:02/34	18:23	08:24-08:37/13	16:49	07:56-08:21/25		16:49		
25	06:02	06:34	07:07	07:27-08:02/35	07:41	08:03-08:24/21	07:20	07:56-08:22/26	07:45	08:09-08:44/35		
	20:46	20:06	19:11		18:21	08:24-08:39/15	16:49			16:50		
26	06:03	06:35	07:08	07:29-08:03/34	07:43	08:04-08:23/19	07:21	07:56-08:23/27	07:45	08:09-08:44/35		
	20:45	20:04	19:09		18:20	08:23-08:39/16	16:48			16:50		
27	06:04	06:36	07:09	07:30-08:02/32	07:44	08:05-08:22/17	07:22	07:56-08:24/28	07:46	08:09-08:44/35		
	20:44	20:03	19:07		18:18	08:22-08:40/18	16:48			16:51		
28	06:05	06:37	07:10	07:31-08:02/31	07:45	08:07-08:22/15	07:23	07:56-08:24/28	07:46	08:10-08:45/35		
	20:43	20:01	19:05		18:17	08:22-08:41/19	16:47			16:52		
29	06:06	06:39	07:11	07:32-08:02/30	07:46	08:08-08:20/12	07:24	07:55-08:25/30	07:46	08:10-08:45/35		
	20:42	19:58	19:04		18:16	08:20-08:43/23	16:47			16:52		
30	06:07	06:40	07:13	07:33-08:02/29	07:47	08:09-08:18/9	07:25	07:55-08:25/30	07:47	08:10-08:45/35		
	20:41	19:56	19:02		18:14	08:18-08:45/27	16:46			16:53		
31	06:08	06:41		07:02-07:18/16		07:49	08:11-08:17/6		07:47	08:10-08:45/35		
	20:40	19:54				18:13	08:17-08:47/30		16:54			
Potential sun hours	464	431	375		343		294		283			
Sum of minutes with flicker	0	329	978		809		863		1071			

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 11:06 AM / 23

Licensed user:

EDR

217 Montgomery St.

US-SYRACUSE, NY 13202

(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110WTG: 33 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (116)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

January			February			March			April			May			June		
1	07:47	08:10-08:51/41	07:32	07:53-08:11/18	06:54	07:01	07:21-08:02/41	06:14	06:34-07:51/77	05:43	06:06-06:24/18	06:14	06:34-07:51/77	05:43	06:06-06:24/18	06:14	06:34-07:51/77
2	16:55	08:51-09:01/10	17:31	07:52-08:12/20	06:53	19:43	07:19-08:03/44	20:15	06:32-07:49/77	05:43	06:05-06:24/19	19:43	07:19-08:03/44	20:15	06:32-07:49/77	05:43	06:05-06:24/19
3	16:56	08:51-09:01/10	17:32	07:51-08:13/22	06:51	19:44	07:17-08:03/46	20:16	06:31-07:48/77	05:42	06:05-06:25/20	19:44	07:17-08:03/46	20:16	06:31-07:48/77	05:42	06:05-06:25/20
4	16:57	08:52-09:01/9	17:33	07:50-08:14/24	06:49	19:45	07:15-08:04/49	20:17	06:30-07:46/76	05:42	06:04-06:25/21	19:45	07:15-08:04/49	20:17	06:30-07:46/76	05:42	06:04-06:25/21
5	16:58	08:52-09:02/10	17:35	07:48-08:14/26	06:48	19:46	07:14-08:05/51	20:19	06:30-07:44/74	05:42	06:04-06:26/22	19:46	07:14-08:05/51	20:19	06:30-07:44/74	05:42	06:04-06:26/22
6	16:59	08:53-09:02/9	17:36	07:47-08:15/28	06:46	19:47	07:12-08:05/53	20:20	06:29-07:41/72	05:41	06:04-06:26/22	19:47	07:12-08:05/53	20:20	06:29-07:41/72	05:41	06:04-06:26/22
7	17:00	08:53-09:01/8	17:37	07:46-08:15/29	06:44	19:48	07:10-08:05/55	20:21	06:29-07:38/69	05:41	06:04-06:27/23	19:48	07:10-08:05/55	20:21	06:29-07:38/69	05:41	06:04-06:27/23
8	17:01	08:54-09:01/7	17:38	07:45-08:16/31	06:43	19:49	07:09-08:06/57	20:22	06:29-07:35/66	05:41	06:03-06:27/24	19:49	07:09-08:06/57	20:22	06:29-07:35/66	05:41	06:03-06:27/24
9	17:02	08:54-09:00/6	17:40	07:43-08:16/33	06:41	19:50	07:07-08:06/59	20:23	06:30-07:24/54	05:40	06:03-06:27/24	19:50	07:07-08:06/59	20:23	06:30-07:24/54	05:40	06:03-06:27/24
10	17:03	08:54-09:00/6	17:41	07:42-08:16/34	06:39	19:51	07:05-08:05/60	20:24	06:30-07:23/53	05:40	06:03-06:28/25	19:51	07:05-08:05/60	20:24	06:30-07:23/53	05:40	06:03-06:28/25
11	17:04	08:55-08:59/4	17:42	07:41-08:16/35	06:38	19:52	07:04-08:06/62	20:25	06:31-07:22/51	05:40	06:03-06:28/25	19:52	07:04-08:06/62	20:25	06:31-07:22/51	05:40	06:03-06:28/25
12	17:05	08:55-08:58/3	17:44	07:39-08:16/37	06:36	19:53	07:02-08:05/63	20:26	06:31-07:20/49	05:40	06:03-06:29/26	19:53	07:02-08:05/63	20:26	06:31-07:20/49	05:40	06:03-06:29/26
13	17:06	08:55-08:56/1	17:45	07:40-08:16/36	06:34	19:54	07:00-08:05/65	20:27	06:32-07:19/47	05:40	06:03-06:29/26	19:54	07:00-08:05/65	20:27	06:32-07:19/47	05:40	06:03-06:29/26
14	17:07	08:13-08:55/42	17:46	07:40-08:16/36	06:32	19:55	06:59-08:05/66	20:28	06:32-07:17/45	05:40	06:03-06:29/26	19:55	06:59-08:05/66	20:28	06:32-07:17/45	05:40	06:03-06:29/26
15	17:08	08:14-08:55/41	17:48	07:40-08:15/35	06:31	19:56	06:57-08:04/67	20:29	06:33-07:15/42	05:40	06:03-06:30/27	19:56	06:57-08:04/67	20:29	06:33-07:15/42	05:40	06:03-06:30/27
16	17:09	08:14-08:55/41	17:49	07:41-08:14/33	06:29	19:57	06:56-08:05/69	20:30	06:34-07:12/38	05:40	06:03-06:30/27	19:57	06:56-08:05/69	20:30	06:34-07:12/38	05:40	06:03-06:30/27
17	17:10	08:15-08:56/41	17:50	07:41-08:13/32	06:27	19:58	06:54-08:04/70	20:31	06:35-07:02/27	05:40	06:03-06:30/27	19:58	06:54-08:04/70	20:31	06:35-07:02/27	05:40	06:03-06:30/27
18	17:11	08:16-08:55/39	17:51	07:43-08:12/29	06:26	20:00	06:52-08:03/71	20:32	06:36-07:01/25	05:40	06:03-06:30/27	20:00	06:52-08:03/71	20:32	06:36-07:01/25	05:40	06:03-06:30/27
19	17:12	08:16-08:55/39	17:52	07:44-08:12/28	06:24	20:01	06:51-08:03/72	20:33	06:37-07:00/23	05:40	06:03-06:30/27	20:01	06:51-08:03/72	20:33	06:37-07:00/23	05:40	06:03-06:30/27
20	17:13	08:16-08:55/39	17:53	07:45-08:10/25	06:22	20:02	06:49-08:02/73	20:34	06:38-06:58/20	05:40	06:03-06:31/28	20:02	06:49-08:02/73	20:34	06:38-06:58/20	05:40	06:03-06:31/28
21	17:14	08:18-08:55/37	17:54	07:47-08:08/21	06:20	20:03	06:48-08:01/73	20:35	06:39-06:57/18	05:40	06:03-06:31/28	20:03	06:48-08:01/73	20:35	06:39-06:57/18	05:40	06:03-06:31/28
22	17:15	08:19-08:54/35	17:55	07:49-08:05/16	06:19	20:04	06:46-08:00/74	20:36	06:42-06:56/14	05:40	06:04-06:32/28	20:04	06:46-08:00/74	20:36	06:42-06:56/14	05:40	06:04-06:32/28
23	17:16	08:20-08:54/34	17:56	07:54-08:01/7	06:17	20:05	06:45-08:00/75	20:37	06:45-06:53/8	05:41	06:04-06:32/28	20:05	06:45-08:00/75	20:37	06:45-06:53/8	05:41	06:04-06:32/28
24	17:17	08:22-08:54/32	17:57	07:54-08:01/7	06:15	20:06	06:43-07:58/75	20:38	06:10-06:14/4	05:41	06:04-06:31/27	20:06	06:43-07:58/75	20:38	06:10-06:14/4	05:41	06:04-06:31/27
25	17:18	08:23-08:53/30	17:58	07:54-08:01/7	06:13	20:07	06:42-07:58/76	20:39	06:09-06:16/7	05:41	06:04-06:31/27	20:07	06:42-07:58/76	20:39	06:09-06:16/7	05:41	06:04-06:31/27
26	17:19	08:25-08:52/27	18:00	07:54-08:01/7	06:11	20:08	06:41-07:57/76	20:40	06:09-06:18/9	05:42	06:05-06:32/27	20:08	06:41-07:57/76	20:40	06:09-06:18/9	05:42	06:05-06:32/27
27	17:20	08:26-08:51/25	18:01	07:54-08:01/7	06:09	20:09	06:40-07:56/77	20:41	06:08-06:19/11	05:42	06:05-06:32/27	20:09	06:40-07:56/77	20:41	06:08-06:19/11	05:42	06:05-06:32/27
28	17:21	08:27-08:50/22	18:02	07:54-08:01/7	06:07	20:10	06:39-07:55/77	20:42	06:08-06:21/13	05:43	06:06-06:33/27	20:10	06:39-07:55/77	20:42	06:08-06:21/13	05:43	06:06-06:33/27
29	17:22	08:28-08:50/22	18:03	07:54-08:01/7	06:05	20:11	06:38-07:55/77	20:43	06:07-06:21/14	05:43	06:06-06:32/26	20:11	06:38-07:55/77	20:43	06:07-06:21/14	05:43	06:06-06:32/26
30	17:23	08:29-08:50/22	18:04	07:54-08:01/7	06:03	20:12	06:37-07:54/77	20:44	06:07-06:23/16	05:43	06:06-06:32/26	20:12	06:37-07:54/77	20:44	06:07-06:23/16	05:43	06:06-06:32/26
31	17:24	08:30-08:49/18	18:05	07:54-08:01/7	06:01	20:13	06:36-07:53/77	20:45	06:06-06:23/17	05:43	06:06-06:32/26	20:13	06:36-07:53/77	20:45	06:06-06:23/17	05:43	06:06-06:32/26
Potential sun hours	294		295		370	401		452		457							
Sum of minutes with flicker	1215		635		192	1950		1193		755							

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 11:06 AM / 24

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EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110WTG: 33 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (116)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	July		August		September		October		November		December	
1	05:44	06:07-06:33/26	06:09	06:41-07:30/49	06:42	07:03-08:05/62	07:14		06:50	07:12-07:46/34	07:26	07:54-08:38/44
	20:58		20:39		19:53		19:00		17:12		16:46	08:38-08:40/2
2	05:44	06:07-06:32/25	06:10	06:40-07:32/52	06:43	07:04-08:04/60	07:15		06:51	07:13-07:45/32	07:27	07:54-08:38/44
	20:58		20:38		19:51		18:58		17:10		16:46	08:38-08:42/4
3	05:45	06:08-06:33/25	06:11	06:40-07:33/53	06:44	07:05-08:04/59	07:16		06:52	07:14-07:45/31	07:29	07:55-08:38/43
	20:58		20:37		19:49		18:57		17:09		16:45	08:38-08:44/6
4	05:45	06:09-06:33/24	06:12	06:39-07:34/55	06:45	07:06-08:03/57	07:17		06:54	07:16-07:45/29	07:30	07:55-08:39/44
	20:58		20:36		19:48		18:55		17:08		16:45	08:39-08:45/6
5	05:46	06:09-06:32/23	06:13	06:39-07:46/67	06:46	07:07-08:02/55	07:18		06:55	07:17-07:45/28	07:31	07:55-08:39/44
	20:58		20:34		19:46		18:53		17:07		16:45	08:39-08:46/7
6	05:47	06:10-06:33/23	06:14	06:39-07:49/70	06:47	07:08-08:01/53	07:19		06:56	07:19-07:45/26	07:32	07:56-08:40/44
	20:58		20:33		19:44		18:52		17:05		16:45	08:40-08:47/7
7	05:47	06:10-06:32/22	06:15	06:38-07:51/73	06:48	07:09-08:00/51	07:20		06:57	07:20-07:44/24	07:33	07:57-08:40/43
	20:57		20:32		19:42		18:50		17:04		16:45	08:40-08:49/9
8	05:48	06:11-06:32/21	06:16	06:38-07:53/75	06:49	07:10-07:59/49	07:21		06:59	07:21-07:43/22	07:33	07:58-08:40/42
	20:57		20:31		19:41		18:48		17:03		16:45	08:40-08:50/10
9	05:49	06:12-06:32/20	06:17	06:39-07:55/76	06:50	07:11-07:58/47	07:23		07:00	07:23-07:43/20	07:34	07:59-08:41/42
	20:57		20:29		19:39		18:46		17:02		16:45	08:41-08:50/9
10	05:49	06:12-06:31/19	06:18	06:40-07:57/77	06:51	07:12-07:56/44	07:24		07:01	07:24-07:42/18	07:35	08:00-08:41/41
	20:56		20:28		19:37		18:45		17:01		16:45	08:41-08:51/10
11	05:50	06:13-06:31/18	06:19	06:41-07:58/77	06:52	07:13-07:55/42	07:25		07:03	07:25-07:40/15	07:36	08:00-08:41/41
	20:56		20:27		19:36		18:43		17:00		16:45	08:41-08:51/10
12	05:51	06:14-06:31/17	06:20	06:42-07:59/77	06:53	07:14-07:53/39	07:26		07:04	07:27-07:40/13	07:37	08:01-08:41/40
	20:55		20:25		19:34		18:41		16:59		16:45	08:41-08:52/11
13	05:52	06:15-06:31/16	06:22	06:43-08:00/77	06:54	07:15-07:51/36	07:27		07:05	07:28-07:38/10	07:38	08:02-08:42/40
	20:55		20:24		19:32		18:40		16:58	08:06-08:18/12	16:45	08:42-08:53/11
14	05:52	06:15-06:30/15	06:23	06:44-08:01/77	06:55	07:16-07:49/33	07:28		07:06	07:29-07:36/7	07:39	08:03-08:43/40
	20:54		20:23		19:30		18:38		16:57	08:03-08:21/18	16:45	08:43-08:54/11
15	05:53	06:16-06:29/13	06:24	06:46-08:02/76	06:56	07:17-07:46/29	07:29		07:07	07:31-07:34/3	07:39	08:04-08:44/40
	20:54		20:21		19:28		18:37		16:56	08:00-08:23/23	16:45	08:43-08:55/12
16	05:54	06:17-06:29/12	06:25	06:47-08:04/77	06:58	07:18-07:43/25	07:31		07:09	07:58-08:25/27	07:40	08:04-08:44/40
	20:53		20:20		19:27		18:35		16:55		16:46	08:43-08:55/12
17	05:55	06:18-06:28/10	06:26	06:48-08:04/76	06:59	07:19-07:40/21	07:32		07:10	07:56-08:26/30	07:41	08:05-08:44/39
	20:52		20:18		19:25		18:33		16:54		16:46	08:44-08:56/12
18	05:56	06:19-06:27/8	06:27	06:49-08:05/76	07:00	07:20-07:35/15	07:33		07:11	07:56-08:28/32	07:41	08:06-08:45/39
	20:52		20:17		19:23		18:32		16:53		16:46	08:44-08:57/13
19	05:57	06:19-06:25/6	06:28	06:50-08:05/75	07:01		07:34	08:23-08:33/10	07:12	07:55-08:29/34	07:42	08:06-08:45/39
	20:51		20:15		19:21		18:30		16:53		16:47	08:44-08:57/13
20	05:57	06:20-06:22/2	06:29	06:51-08:06/75	07:02		07:35	08:19-08:36/17	07:14	07:54-08:29/35	07:43	08:07-08:46/39
	20:50		20:14		19:20		18:29		16:52		16:47	08:45-08:58/13
21	05:58	06:53-07:04/11	06:30	06:52-08:06/74	07:03		07:37	08:17-08:39/22	07:15	07:53-08:30/37	07:43	08:07-08:46/39
	20:50		20:12		19:18		18:27		16:51		16:47	08:45-08:58/13
22	05:59	06:51-07:06/15	06:31	06:53-08:06/73	07:04		07:38	08:15-08:41/26	07:16	07:54-08:31/37	07:44	08:08-08:47/39
	20:49		20:11		19:16		18:26		16:50		16:48	08:46-08:59/13
23	06:00	06:49-07:08/19	06:32	06:54-08:07/73	07:05		07:39	08:14-08:42/28	07:17	07:53-08:32/39	07:44	08:08-08:47/39
	20:48		20:09		19:14		18:24		16:50		16:48	08:46-08:59/13
24	06:01	06:48-07:10/22	06:33	06:55-08:07/72	07:06		07:40	08:12-08:42/30	07:18	07:53-08:32/39	07:45	08:08-08:47/39
	20:47		20:07		19:12		18:23		16:49		16:49	08:46-08:59/13
25	06:02	06:47-07:11/24	06:34	06:56-08:07/71	07:07		07:41	08:12-08:44/32	07:20	07:52-08:33/41	07:45	08:09-08:48/39
	20:46		20:06		19:11		18:21		16:49		16:50	08:47-09:00/13
26	06:03	06:46-07:12/26	06:35	06:57-08:07/70	07:08		07:43	08:11-08:44/33	07:21	07:53-08:34/41	07:45	08:09-08:48/39
	20:45		20:04		19:09		18:20		16:48		16:50	08:48-09:00/12
27	06:04	06:45-07:20/35	06:36	06:58-08:07/69	07:09		07:44	08:10-08:44/34	07:22	07:53-08:34/41	07:46	08:09-08:49/40
	20:44		20:03		19:07		18:18		16:48		16:51	08:48-09:00/12
28	06:05	06:44-07:24/40	06:37	06:59-08:06/67	07:10		07:45	08:10-08:45/35	07:23	07:53-08:35/42	07:46	08:10-08:50/40
	20:43		20:01		19:05		18:17		16:47		16:52	08:49-09:01/12
29	06:06	06:43-07:26/43	06:39	07:00-08:06/66	07:11		07:46	08:09-08:45/36	07:24	07:53-08:35/42	07:46	08:10-08:50/40
	20:42		19:58		19:04		18:16		16:47		16:52	08:49-09:01/12
30	06:07	06:43-07:28/45	06:40	07:01-08:06/65	07:13		07:47	08:09-08:45/36	07:25	07:53-08:36/43	07:47	08:10-08:50/40
	20:41		19:56		19:02		18:14		16:46	08:36-08:37/1	16:53	08:50-09:01/11
31	06:08	06:42-07:29/47	06:41	07:02-08:05/63			07:49	08:11-08:46/35			07:47	08:10-08:50/40
	20:40		19:54				18:13				16:54	08:50-09:01/11
Potential sun hours	463		431		375		343		294		283	
Sum of minutes with flicker	674		2173		777		374		926		1572	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 11:06 AM / 25

Licensed user:

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Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110WTG: 36 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (130)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

January		February		March		April		May		June	
1	07:47 08:13-08:24/11 16:55	07:32 17:31 18:06	06:54 18:06 18:06			07:01 07:21-08:15/54 19:43	06:14 06:42-07:20/38 20:15	05:43 06:06-06:47/41 20:47	06:45-06:52/7		
2	07:47 08:12-08:25/13 16:56	07:31 17:32 18:08	06:53 18:08 18:08			06:59 07:19-08:14/55 19:44	06:12 06:32-06:36/4 20:16	05:43 06:05-06:47/42 20:47	06:45-06:52/7		
3	07:47 08:12-08:26/14 16:57	07:30 17:33 18:09	06:51 07:11-07:21/10 18:09			06:58 07:17-08:13/56 19:45	06:11 06:31-06:39/8 20:18	05:42 06:05-06:47/42 20:48	06:45-06:53/8		
4	07:47 08:12-08:27/15 16:58	07:29 17:34 18:10	06:49 07:09-07:24/15 18:10			06:56 07:15-08:12/57 19:46	06:10 06:30-06:41/11 20:19	05:42 06:04-06:46/42 20:49	06:44-06:52/8		
5	07:47 08:12-08:29/17 16:59	07:28 17:36 18:11	06:48 07:07-07:26/19 18:11			06:54 07:14-08:12/58 19:47	06:08 06:29-06:42/13 20:20	05:42 06:04-06:46/42 20:50	06:44-06:53/9		
6	07:47 08:12-08:30/18 16:59	07:27 17:37 18:12	06:46 07:06-07:29/23 18:12			06:53 07:12-08:11/59 19:48	06:07 06:27-06:42/15 20:21	05:41 06:04-06:47/43 20:50	06:45-06:53/8		
7	07:47 08:12-08:31/19 17:00	07:25 17:38 18:14	06:44 07:04-07:30/26 18:14			06:51 07:10-08:09/59 19:49	06:06 06:26-06:43/17 20:22	05:41 06:03-06:46/43 20:51	06:44-06:52/8		
8	07:47 08:11-08:31/20 17:01	07:24 17:40 19:15	07:43 08:02-08:31/29 19:15			06:49 07:11-08:09/58 19:50	06:04 06:25-06:44/19 20:23	05:41 06:03-06:45/42 20:52	06:42-06:53/11		
9	07:47 08:12-08:32/20 17:03	07:23 17:41 19:16	07:41 08:01-08:32/31 19:16			06:48 07:07-08:07/60 19:52	06:03 06:24-06:45/21 20:24	05:40 06:03-06:45/42 20:52	06:42-06:53/11		
10	07:46 08:12-08:33/21 17:04	07:22 17:42 19:17	07:39 07:59-08:33/34 19:17			06:46 07:05-08:05/60 19:53	06:02 06:23-06:45/22 20:25	05:40 06:03-06:45/42 20:53	06:42-06:54/12		
11	07:46 08:12-08:34/22 17:05	07:20 17:44 19:18	07:38 07:57-08:33/36 19:18			06:44 07:04-08:04/60 19:54	06:01 06:22-06:46/24 20:26	05:40 06:03-06:45/42 20:54	06:42-06:54/12		
12	07:46 08:12-08:34/22 17:06	07:19 17:45 19:20	07:36 07:55-08:33/38 19:20			06:43 07:02-08:01/59 19:55	06:00 06:21-06:46/25 20:27	05:40 06:03-06:45/42 20:54	06:42-06:54/12		
13	07:45 08:12-08:36/24 17:07	07:18 17:46 19:21	07:34 07:54-08:34/40 19:21			06:41 07:00-07:59/59 19:56	05:59 06:20-06:47/27 20:28	05:40 06:03-06:45/42 20:55	06:42-06:54/12		
14	07:45 08:12-08:36/24 17:08	07:16 17:48 19:22	07:32 07:52-08:34/42 19:22			06:39 06:59-07:34/35 19:57	05:58 06:19-06:47/28 20:30	05:40 06:03-06:44/41 20:55	06:41-06:54/13		
15	07:45 08:12-08:37/25 17:09	07:15 17:49 19:23	07:31 07:50-08:33/43 19:23			06:38 06:57-07:30/33 19:58	05:57 06:18-06:47/29 20:31	05:40 06:03-06:44/41 20:56	06:41-06:55/14		
16	07:44 08:12-08:37/25 17:10	07:14 17:50 19:24	07:29 07:49-08:34/45 19:24			06:36 06:56-07:23/27 20:00	05:56 06:17-06:47/30 20:32	05:40 06:03-06:44/41 20:56	06:41-06:55/14		
17	07:44 08:13-08:38/25 17:12	07:12 17:51 19:25	07:27 07:47-08:33/46 19:25			06:34 06:54-07:23/29 20:00	05:55 06:16-06:47/31 20:33	05:40 06:03-06:44/41 20:56	06:41-06:55/14		
18	07:43 08:13-08:38/25 17:13	07:11 17:53 19:27	07:26 07:45-08:33/48 19:27			06:33 06:52-07:23/31 20:01	05:54 06:15-06:48/33 20:34	05:40 06:03-06:44/41 20:57	06:41-06:55/14		
19	07:43 08:13-08:38/25 17:14	07:09 17:54 19:28	07:24 07:43-08:32/49 19:28			06:31 06:51-07:24/33 20:02	05:53 06:14-06:48/34 20:35	05:40 06:03-06:44/41 20:57	06:41-06:55/14		
20	07:42 08:14-08:39/25 17:15	07:08 17:55 19:29	07:22 07:42-08:32/50 19:29			06:30 06:49-07:24/35 20:03	05:52 06:13-06:48/35 20:36	05:40 06:03-06:44/41 20:57	06:41-06:55/14		
21	07:41 08:14-08:39/25 17:16	07:07 17:56 19:30	07:20 07:40-08:31/51 19:30			06:28 06:48-07:24/36 20:04	05:51 06:12-06:47/35 20:37	05:40 06:03-06:44/41 20:58	06:41-06:55/14		
22	07:41 08:14-08:38/24 17:18	07:05 17:58 19:31	07:19 07:38-08:30/52 19:31			06:27 06:46-07:23/37 20:05	05:50 06:12-06:48/36 20:38	05:40 06:04-06:45/41 20:58	06:42-06:56/14		
23	07:40 08:15-08:38/23 17:19	07:04 17:59 19:32	07:17 07:36-08:28/52 19:32			06:25 06:45-07:24/39 20:06	05:49 06:11-06:47/36 20:39	05:41 06:04-06:45/41 20:58	06:42-06:56/14		
24	07:39 08:16-08:39/23 17:20	07:02 18:00 19:33	07:15 07:35-08:28/53 19:33			06:24 06:43-07:23/40 20:07	05:48 06:10-06:47/37 20:40	05:41 06:04-06:45/41 20:58	06:42-06:56/14		
25	07:38 08:17-08:38/21 17:21	07:00 18:01 19:35	07:13 07:33-08:26/53 19:35			06:22 06:42-07:23/41 20:09	05:48 06:09-06:46/37 20:41	05:41 06:04-06:45/41 20:58	06:42-06:56/14		
26	07:38 08:17-08:38/21 17:23	06:59 18:03 19:36	07:12 07:31-08:24/53 19:36			06:21 06:41-07:23/42 20:10	05:47 06:09-06:47/38 20:41	05:42 06:05-06:46/41 20:59	06:43-06:57/14		
27	07:37 08:18-08:37/19 17:24	06:57 18:04 19:37	07:10 07:29-08:22/53 19:37			06:19 06:40-07:22/42 20:11	05:46 06:08-06:47/39 20:42	05:42 06:05-06:46/41 20:59	06:43-06:57/14		
28	07:36 08:20-08:36/16 17:25	06:56 18:05 19:38	07:08 07:28-08:20/52 19:38			06:18 06:41-07:22/41 20:12	05:46 06:08-06:48/40 20:43	05:42 06:06-06:47/41 20:59	06:44-06:58/14		
29	07:35 08:21-08:35/14 17:27	06:55 18:06 19:39	07:06 07:26-08:17/51 19:39			06:16 06:41-07:21/40 20:13	05:45 06:07-06:47/40 20:44	05:43 06:06-06:48/42 20:59	06:45-06:57/12		
30	07:34 08:24-08:33/9 17:28	06:54 18:07 19:40	07:05 07:24-08:14/50 19:40			06:15 06:41-07:20/39 20:14	05:44 06:06-06:46/40 20:45	05:43 06:06-06:48/42 20:59	06:45-06:57/12		
31	07:33 17:29 17:29	06:53 18:08 19:41	07:03 07:22-08:15/53 19:41			06:14 06:40-07:19/38 20:15	05:43 06:05-06:45/39 20:46	05:42 06:05-06:46/40 20:58	06:45-06:57/12		
Potential sun hours		294	295	370	401	452	457	1524			
Sum of minutes with flicker		605	0	1199	1409	1157	1524				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 11:06 AM / 26

Licensed user:

EDR

217 Montgomery St.

US-SYRACUSE, NY 13202

(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110WTG: 36 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (130)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	July		August		September		October		November		December	
1	05:44	06:07-06:49/42	06:09	06:31-06:56/25	06:42	07:03-08:03/60	07:14	07:34-08:13/39	06:50		07:26	07:54-08:16/22
	20:59	06:46-06:58/12	20:39		19:53		19:00		17:12		16:46	
2	05:44	06:07-06:49/42	06:10	06:32-06:55/23	06:43	07:04-08:04/60	07:15	07:35-08:12/37	06:51		07:28	07:55-08:16/21
	20:58	06:46-06:58/12	20:38	07:09-07:10/1	19:51		18:58		17:10		16:46	
3	05:45	06:08-06:50/42	06:11	06:33-06:55/22	06:44	07:05-08:05/60	07:16	07:36-08:11/35	06:53		07:29	07:56-08:16/20
	20:58	06:47-06:58/11	20:37	07:03-07:16/13	19:49		18:57		17:09		16:45	
4	05:45	06:09-06:51/42	06:12	06:34-06:54/20	06:45	07:08-08:06/58	07:17	07:37-08:09/32	06:54		07:30	07:56-08:16/20
	20:58	06:48-06:59/11	20:36	07:00-07:19/19	19:48		18:55		17:08		16:45	
5	05:46	06:09-06:52/43	06:13	06:35-06:54/19	06:46	07:07-08:06/59	07:18	07:38-08:08/30	06:55		07:31	07:57-08:16/19
	20:58	06:50-06:59/9	20:34	06:58-07:21/23	19:46		18:53		17:07		16:45	
6	05:47	06:10-06:53/43	06:14	06:36-06:53/17	06:47	07:08-08:07/59	07:19	07:40-08:07/27	06:56		07:32	07:58-08:16/18
	20:58	06:51-06:59/8	20:33	06:56-07:22/26	19:44		18:52		17:05		16:45	
7	05:47	06:10-06:53/43	06:15	06:37-06:52/15	06:48	07:09-08:07/58	07:20	07:41-08:05/24	06:58		07:33	07:59-08:16/17
	20:57	06:51-06:59/8	20:32	06:55-07:24/29	19:43		18:50		17:04		16:45	
8	05:48	06:11-06:53/42	06:16	06:38-06:50/12	06:49	07:10-08:07/57	07:21	07:42-08:03/21	06:59		07:34	08:00-08:16/16
	20:57	06:51-06:59/8	20:31	06:54-07:25/31	19:41		18:48		17:03		16:45	
9	05:49	06:12-06:54/42	06:17	06:39-06:49/10	06:50	07:11-08:07/56	07:23	07:43-08:01/18	07:00		07:34	08:01-08:15/14
	20:57	06:52-07:00/8	20:29	06:53-07:26/33	19:39		18:46		17:02		16:45	
10	05:49	06:12-06:54/42	06:18	06:40-06:47/7	06:51	07:12-08:07/55	07:24	07:44-07:57/13	07:01		07:35	08:02-08:15/13
	20:56	06:52-06:59/7	20:28	06:51-07:26/35	19:37		18:45		17:01		16:45	
11	05:50	06:13-06:55/42	06:19	06:41-06:44/3	06:52	07:13-08:07/54	07:25	07:48-07:49/1	07:03		07:36	08:03-08:14/11
	20:56	06:54-07:00/6	20:27	06:51-07:27/36	19:36		18:43		17:00		16:45	
12	05:51	06:14-06:55/41	06:20	06:50-07:28/38	06:53	07:14-08:07/53	07:26		07:04	07:55-08:05/10	07:37	08:04-08:14/10
	20:55	06:54-07:00/6	20:25		19:34		18:41		16:59		16:45	
13	05:51	06:15-06:55/40	06:21	06:49-07:28/39	06:54	07:15-08:04/49	07:27		07:05	07:53-08:07/14	07:38	08:05-08:14/9
	20:55	06:54-07:00/6	20:24		19:32	08:04-08:07/3	18:40		16:58		16:45	
14	05:52	06:15-06:55/40	06:23	06:48-07:28/40	06:55	07:16-08:07/51	07:28		07:06	07:52-08:08/16	07:39	08:07-08:14/7
	20:54	06:54-07:00/6	20:23		19:30		18:38		16:57		16:45	
15	05:53	06:16-06:56/40	06:24	06:48-07:29/41	06:56	07:17-08:09/52	07:29		07:08	07:51-08:10/19	07:39	08:08-08:14/6
	20:54	06:55-07:00/5	20:21		19:28		18:37		16:56		16:45	
16	05:54	06:17-06:56/39	06:25	06:48-07:30/42	06:58	07:18-08:11/53	07:31		07:09	07:50-08:11/21	07:40	08:10-08:12/2
	20:53	06:55-07:00/5	20:20		19:27		18:35		16:55		16:45	
17	05:55	06:18-06:56/38	06:26	06:48-07:30/42	06:59	07:19-08:12/53	07:32		07:10	07:50-08:11/21	07:41	
	20:52	06:56-07:00/4	20:18		19:25		18:33		16:54		16:46	
18	05:56	06:19-06:57/38	06:27	06:49-07:30/41	07:00	07:20-08:13/53	07:33		07:11	07:50-08:13/23	07:41	
	20:52	06:57-07:00/3	20:17		19:23		18:32		16:53		16:46	
19	05:56	06:19-06:56/37	06:28	06:50-07:30/40	07:01	07:21-08:14/53	07:34		07:12	07:50-08:13/23	07:42	
	20:51	06:56-06:59/3	20:15		19:21		18:30		16:53		16:46	
20	05:57	06:20-06:57/37	06:29	06:51-07:30/39	07:02	07:22-08:14/52	07:35		07:14	07:49-08:13/24	07:43	
	20:50	06:57-06:59/2	20:14		19:20		18:29		16:52		16:47	
21	05:58	06:21-06:57/36	06:30	06:52-07:29/37	07:03	07:23-08:15/52	07:37		07:15	07:49-08:14/25	07:43	
	20:50	06:57-06:59/2	20:12		19:18		18:27		16:51		16:47	
22	05:59	06:22-06:58/36	06:31	06:53-07:29/36	07:04	07:24-08:15/51	07:38		07:16	07:50-08:15/25	07:44	
	20:49	06:58-06:59/1	20:11		19:16		18:26		16:50		16:48	
23	06:00	06:23-06:58/35	06:32	06:54-07:28/34	07:05	07:25-08:15/50	07:39		07:17	07:50-08:15/25	07:44	
	20:48	06:58-06:59/1	20:09		19:14		18:24		16:50		16:48	
24	06:01	06:24-06:58/34	06:33	06:55-07:28/33	07:06	07:26-08:15/49	07:40		07:18	07:50-08:15/25	07:45	
	20:47	06:58-06:59/1	20:08		19:12		18:23		16:49		16:49	
25	06:02	06:25-06:58/33	06:34	06:56-07:27/31	07:07	07:27-08:15/48	07:41		07:20	07:51-08:16/25	07:45	
	20:46		20:06		19:11		18:21		16:49		16:49	
26	06:03	06:26-06:58/32	06:35	06:57-07:26/29	07:08	07:29-08:16/47	07:43		07:21	07:51-08:16/25	07:45	
	20:45		20:04		19:09		18:20		16:48		16:50	
27	06:04	06:27-06:58/31	06:36	06:58-07:25/27	07:09	07:30-08:15/45	07:44		07:22	07:51-08:16/25	07:46	
	20:44		20:03		19:07		18:18		16:48		16:51	
28	06:05	06:28-06:58/30	06:37	06:59-07:32/33	07:10	07:31-08:15/44	07:45		07:23	07:52-08:16/24	07:46	08:15-08:19/4
	20:43		20:01	07:40-07:54/14	19:05		18:17		16:47		16:51	
29	06:06	06:29-06:58/29	06:39	07:00-07:35/35	07:12	07:32-08:14/42	07:46		07:24	07:52-08:16/24	07:46	08:14-08:20/6
	20:42		19:58	07:36-07:58/22	19:04		18:16		16:47		16:52	
30	06:07	06:29-06:57/28	06:40	07:01-08:00/59	07:13	07:33-08:14/41	07:48		07:25	07:53-08:16/23	07:47	08:13-08:22/9
	20:41		19:56		19:02		18:14		16:46		16:53	
31	06:08	06:30-06:56/26	06:41	07:02-08:01/59			07:49				07:47	08:13-08:23/10
	20:40		19:54				18:13				16:54	
Potential sun hours	464		431		375		343		294		283	
Sum of minutes with flicker	1280		1230		1577		277		417		254	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 11:06 AM / 27

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110WTG: 41 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (136)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	January		February		March		April		May		June	
1	07:47	08:21-08:45/24	07:32	08:01-08:35/34	06:54	07:29-08:01/32	07:01	08:10-08:53/43	06:14	05:43		
	16:55		17:31	08:35-08:54/19	18:07		19:43		20:15	20:47		
2	07:47	08:21-08:46/25	07:31	08:01-08:36/35	06:53	07:30-07:58/28	07:00	08:11-08:51/40	06:12	05:43		
	16:56		17:32	08:36-08:53/17	18:08		19:44		20:16	20:47		
3	07:47	08:21-08:46/25	07:30	08:01-08:37/36	06:51	07:32-07:57/25	06:58	08:12-08:49/37	06:11	05:42		
	16:57		17:33	08:37-08:51/14	18:09		19:45		20:18	20:48		
4	07:47	08:21-08:47/26	07:29	08:01-08:36/35	06:49	07:33-07:53/20	06:56	08:13-08:46/33	06:10	05:42		
	16:58		17:35	08:40-08:47/7	18:10		19:46		20:19	20:49		
5	07:47	08:21-08:48/27	07:28	07:52-08:36/44	06:48	07:31-07:48/17	06:54	08:15-08:45/30	06:08	05:42		
	16:59		17:36		18:11		19:47		20:20	20:50		
6	07:47	08:21-08:49/28	07:27	07:50-08:36/46	06:46	07:28-07:52/24	06:53	08:17-08:42/25	06:07	05:41		
	17:00		17:37		18:13		19:48		20:21	20:50		
7	07:47	08:22-08:50/28	07:25	07:49-08:36/47	06:44	07:15-07:24/9	06:51	08:19-08:38/19	06:06	05:41		
	17:01		17:39		18:14	07:25-07:54/29	19:49		20:22	20:51		
8	07:47	08:22-08:51/29	07:24	07:48-08:37/49	07:43	08:11-08:56/45	06:49	08:25-08:32/7	06:05	05:41		
	17:02		17:40		19:15	18:49-18:53/4	19:51		20:23	20:52		
9	07:47	08:21-08:51/30	07:23	07:48-08:37/49	07:41	08:10-08:58/48	06:48		06:03	05:41		
	17:03		17:41		19:16	18:47-18:55/8	19:52		20:24	20:52		
10	07:46	08:22-08:52/30	07:22	07:46-08:36/50	07:39	08:08-08:59/51	06:46		06:02	05:40		
	17:04		17:42		19:17	18:45-18:56/11	19:53		20:25	20:53		
11	07:46	08:22-08:53/31	07:20	07:46-08:36/50	07:38	08:06-09:00/54	06:44		06:01	05:40		
	17:05		17:44		19:19	18:43-18:57/14	19:54		20:26	20:54		
12	07:46	08:21-08:53/32	07:19	07:46-08:35/49	07:36	08:06-09:02/56	06:43		06:00	05:40		
	17:06		17:45		19:20	18:42-18:57/15	19:55		20:27	20:54		
13	07:46	08:22-08:54/32	07:18	07:46-08:34/48	07:34	08:05-09:02/57	06:41		05:59	05:40		
	17:07		17:46	07:48-07:54/6	19:21	18:42-18:59/17	19:56		20:29	20:55		
14	07:45	08:22-08:54/32	07:17	07:44-07:58/14	07:33	08:04-09:02/58	06:39		05:58	05:40		
	17:08		17:48	07:46-08:33/47	19:22	18:41-19:00/19	19:57		20:30	20:55		
15	07:45	08:22-08:56/34	07:15	07:42-08:00/18	07:31	08:03-09:02/59	06:38		05:57	05:40		
	17:09		17:49	07:46-08:31/45	19:23	18:41-19:01/20	19:58		20:31	20:56		
16	07:44	08:22-08:56/34	07:14	07:41-08:02/21	07:29	08:04-09:03/59	06:36		05:56	05:40		
	17:10		17:50	07:46-08:30/44	19:24	18:41-19:03/22	20:00		20:32	20:56		
17	07:44	08:23-08:57/34	07:12	07:38-08:10/32	07:27	08:04-09:03/59	06:35		05:55	05:40		
	17:12		17:51	08:13-08:28/15	19:26	18:41-19:03/22	20:00		20:33	20:56		
18	07:43	08:23-08:57/34	07:11	07:35-08:08/33	07:26	08:03-09:03/60	06:33		05:54	05:40		
	17:13		17:53	08:16-08:24/8	19:27	18:41-19:02/21	20:01		20:34	20:57		
19	07:43	08:22-08:57/35	07:10	07:33-08:06/33	07:24	08:03-09:03/60	06:31		05:53	05:40		
	17:14		17:54	08:06-08:08/2	19:28	18:42-19:00/18	20:02		20:35	20:57		
20	07:42	08:23-08:58/35	07:08	07:31-08:06/35	07:22	08:05-09:03/58	06:30		05:52	05:40		
	17:15		17:55		19:29	18:44-18:59/15	20:03		20:36	20:57		
21	07:41	08:23-08:58/35	07:07	07:31-08:05/34	07:20	08:05-09:03/58	06:28		05:51	05:40		
	17:17		17:57		19:30	18:45-18:56/11	20:04		20:37	20:58		
22	07:41	08:24-08:58/34	07:05	07:30-08:05/35	07:19	08:06-09:02/56	06:27		05:50	05:41		
	17:18		17:58		19:31		20:05		20:38	20:58		
23	07:40	08:09-08:15/6	07:04	07:30-08:05/35	07:17	08:07-09:01/54	06:25		05:49	05:41		
	17:19	08:24-08:57/33	17:59		19:32		20:06		20:39	20:58		
24	07:39	08:07-08:23/16	07:02	07:29-08:05/36	07:15	08:08-09:02/54	06:24		05:49	05:41		
	17:20	08:25-08:58/33	18:00		19:34		20:07		20:40	20:58		
25	07:38	08:05-08:25/20	07:01	07:28-08:04/36	07:13	08:08-09:01/53	06:22		05:48	05:41		
	17:22	08:26-08:58/32	18:02		19:35		20:09		20:41	20:58		
26	07:38	08:04-08:28/24	06:59	07:29-08:04/35	07:12	08:07-09:00/53	06:21		05:47	05:42		
	17:23	08:28-08:58/30	18:03		19:36		20:10		20:41	20:59		
27	07:37	08:03-08:30/27	06:57	07:28-08:03/35	07:10	08:07-08:58/51	06:19		05:46	05:42		
	17:24	08:30-08:58/28	18:04		19:37		20:11		20:42	20:59		
28	07:36	08:02-08:31/29	06:56	07:29-08:02/33	07:08	08:08-08:58/50	06:18		05:46	05:42		
	17:25	08:31-08:57/26	18:05		19:38		20:12		20:43	20:59		
29	07:35	08:01-08:32/31			07:07	08:08-08:57/49	06:16		05:45	05:43		
	17:27	08:32-08:57/25			19:39		20:13		20:44	20:59		
30	07:34	08:01-08:34/33			07:05	08:08-08:55/47	06:15		05:45	05:43		
	17:28	08:34-08:56/22			19:40		20:14		20:45	20:59		
31	07:33	08:01-08:34/33			07:03	08:09-08:54/45			05:44			
	17:29	08:34-08:55/21			19:42				20:46			
Potential sun hours	294		295		370		401		452		457	
Sum of minutes with flicker	1143		1213		1695		234		0		0	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 11:06 AM / 28

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110WTG: 41 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (136)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	[July	[August	[September	[October	[November	[December
1	05:44 20:59	06:09 20:39	06:42 19:53	07:14 19:00	07:44-08:41/57 18:21-18:38/17	06:50 17:12
2	05:44 20:58	06:10 20:38	06:43 19:51	07:15 18:59	07:45-08:39/54 18:21-18:36/15	06:51 17:10
3	05:45 20:58	06:11 20:37	06:44 19:49	07:16 18:57	07:45-08:38/53 18:22-18:34/12	06:53 17:09
4	05:45 20:58	06:12 20:36	06:45 19:48	07:17 18:55	07:46-08:36/50 18:23-18:32/9	06:54 17:08
5	05:46 20:58	06:13 20:34	06:46 19:46	07:18 18:53	07:48-08:35/47 18:24-18:30/6	06:55 17:07
6	05:47 20:58	06:14 20:33	06:47 19:44	07:19 18:52	07:50-08:32/42 18:28-18:29/1	06:56 17:05
7	05:47 20:57	06:15 20:32	06:48 19:43	07:20 18:50	07:55-07:57/2 08:02-08:29/27	06:58 17:04
8	05:48 20:57	06:16 20:31	06:49 19:41	07:22 18:48	08:05-08:26/21 08:07-08:21/14	06:59 17:03
9	05:49 20:57	06:17 20:29	06:50 19:39	07:23 18:47	08:09-08:20/11 08:07-08:24/17	07:00 17:02
10	05:49 20:56	06:18 20:28	06:51 19:37	07:24 18:45	08:06-08:29/23 08:06-08:25/19	07:01 17:01
11	05:50 20:56	06:19 20:27	06:52 19:36	07:25 18:43	08:04-08:31/27 08:05-08:26/21	07:03 17:00
12	05:51 20:55	06:21 20:25	06:53 19:34	07:26 18:42	08:04-08:33/29 08:05-08:28/23	07:04 16:59
13	05:52 20:55	06:22 20:24	06:54 19:32	07:27 18:40	08:02-08:34/32 08:04-08:29/25	07:05 16:58
14	05:52 20:54	06:23 20:23	06:56 19:30	07:28 18:38	08:01-08:35/34 08:03-08:29/26	07:06 16:57
15	05:53 20:54	06:24 20:21	06:57 19:29	07:30 18:37	08:01-08:35/34 08:03-08:30/27	07:08 16:56
16	05:54 20:53	06:25 20:20	06:58 19:27	07:31 18:35	08:00-08:36/36 08:01-08:31/30	07:09 16:55
17	05:55 20:53	06:26 20:18	06:59 19:25	07:32 18:33	08:01-08:37/36 07:59-08:31/32	07:10 16:54
18	05:56 20:52	06:27 20:17	07:00 19:23	07:33 18:32	08:00-08:36/36 07:59-08:32/33	07:11 16:53
19	05:57 20:51	06:28 20:15	07:01 19:21	07:34 18:30	08:00-08:36/36 07:59-08:32/33	07:13 16:53
20	05:57 20:50	06:29 20:14	07:02 19:20	07:35 18:29	08:00-08:36/36 08:02-08:36/34	07:14 16:52
21	05:58 20:50	06:30 20:12	07:03 19:18	07:37 18:27	08:00-08:34/34 07:59-08:34/35	07:15 16:51
22	05:59 20:49	06:31 20:11	07:04 19:16	07:38 18:26	08:02-08:36/34 08:36-08:37/1	07:16 16:51
23	06:00 20:48	06:32 20:09	07:05 19:14	07:39 18:24	08:03-08:35/32 08:35-08:38/3	07:17 16:50
24	06:01 20:47	06:33 20:08	07:06 19:13	07:40 18:23	08:05-08:38/33 08:44-08:55/11	07:19 16:49
25	06:02 20:46	06:34 20:06	07:07 19:11	07:41 18:21	08:09-08:40/31 08:42-08:59/17	07:20 16:49
26	06:03 20:45	06:35 20:04	07:08 19:09	07:43 18:20	08:11-08:31/20 08:16-09:00/44	07:21 16:48
27	06:04 20:44	06:36 20:03	07:09 19:07	07:44 18:18	08:12-08:29/17 08:15-09:01/46	07:22 16:48
28	06:05 20:43	06:38 20:01	07:10 19:06	07:45 18:17	08:15-08:27/12 08:16-09:03/47	07:23 16:47
29	06:06 20:42	06:39 20:00	07:12 19:04	07:46 18:16	08:15-09:04/49 08:19-08:22/3	07:24 16:47
30	06:07 20:41	06:40 19:56	07:13 19:02	07:48 18:14	08:15-09:04/49 08:16-09:05/49	07:25 16:46
31	06:08 20:40	06:41 19:55		07:49 18:13		07:26 16:54
Potential sun hours	464	431	375	343	294	283
Sum of minutes with flicker	0	0	1431	1272	1323	717

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 11:06 AM / 29

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110WTG: 43 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (142)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

January		February		March		April		May		June	
1	07:47 16:55	07:32 17:31		06:54 18:07	07:28-07:59/31	07:01 19:43	07:31-08:23/52	06:14 20:15	07:01-07:22/21	05:43 20:47	
2	07:47 16:56	07:31 17:32		06:53 18:08	07:26-08:00/34	07:00 19:44	07:31-08:20/49	06:12 20:16	07:01-07:20/19	05:43 20:47	06:35-06:36/1
3	07:47 16:57	07:30 17:33		06:51 18:09	07:26-08:01/35	06:58 19:45	07:30-08:02/32	06:11 20:18	07:03-07:19/16	05:42 20:48	06:30-06:42/12
4	07:47 16:58	07:29 17:35		06:49 18:10	07:17-08:02/45	06:56 19:46	07:30-08:01/31	06:10 20:19	07:05-07:17/12	05:42 20:49	06:28-06:44/16
5	07:47 16:59	07:28 17:36		06:48 18:11	07:14-08:02/48	06:54 19:47	07:30-08:01/31	06:08 20:20	07:10-07:12/2	05:42 20:50	06:26-06:46/20
6	07:47 17:00	07:27 17:37		06:46 18:13	07:12-08:03/51	06:53 19:48	07:30-08:00/30	06:07 20:21		05:41 20:50	06:26-06:48/22
7	07:47 17:01	07:25 17:39		06:44 18:14	07:08-08:02/54	06:51 19:49	07:30-07:59/29	06:06 20:22		05:41 20:51	06:25-06:49/24
8	07:47 17:02	07:24 17:40		07:43 19:15	08:06-09:02/56	06:49 19:51	07:31-07:58/27	06:05 20:23		05:41 20:52	06:23-06:49/26
9	07:47 17:03	07:23 17:41		07:41 19:16	08:05-09:03/58	06:48 19:52	07:31-07:57/26	06:03 20:24		05:41 20:52	06:23-06:51/28
10	07:46 17:04	07:22 17:42		07:39 19:17	08:03-09:02/59	06:46 19:53	07:32-07:55/23	06:02 20:25		05:40 20:53	06:23-06:52/29
11	07:46 17:05	07:21 17:44		07:38 19:19	08:01-08:24/23 18:38-18:56/18	06:44 19:54	07:34-07:54/20	06:01 20:26		05:40 20:54	06:23-06:52/29
12	07:46 17:06	07:19 17:45		07:36 19:20	08:00-08:28/28 18:37-18:57/20	06:43 19:55	07:36-07:51/15	06:00 20:27		05:40 20:54	06:22-06:53/31
13	07:46 17:07	07:18 17:46		07:34 19:21	07:58-08:30/32 18:38-18:59/21	06:41 19:56	07:39-07:46/7	05:59 20:29		05:40 20:55	06:22-06:54/32
14	07:45 17:08	07:17 17:48		07:33 19:22	07:56-08:32/36 18:38-19:00/22	06:39 19:57	07:09-07:22/13	05:58 20:30		05:40 20:55	06:22-06:55/33
15	07:45 17:09	07:15 17:49		07:31 19:23	07:55-08:33/38 18:37-19:00/23	06:38 19:58	07:06-07:23/17	05:57 20:31		05:40 20:56	06:22-06:55/33
16	07:44 17:10	07:14 17:50		07:29 19:24	07:55-08:34/39 18:39-18:59/20	06:36 20:00	07:04-07:25/21	05:56 20:32		05:40 20:56	06:22-06:55/33
17	07:44 17:12	07:12 17:51		07:27 19:26	07:54-08:34/40 18:39-18:58/19	06:35 20:00	07:03-07:26/23	05:55 20:33		05:40 20:56	06:22-06:56/34
18	07:43 17:13	07:11 17:53		07:26 19:27	07:54-08:34/40 18:40-18:56/16	06:33 20:01	07:02-07:27/25	05:54 20:34		05:40 20:57	06:22-06:56/34
19	07:43 17:14	07:10 17:54		07:24 19:28	07:53-08:34/41 18:42-18:53/11	06:31 20:02	07:00-07:27/27	05:53 20:35		05:40 20:57	06:22-06:56/34
20	07:42 17:15	07:08 17:55		07:22 19:29	07:54-08:35/41	06:30 20:03	06:59-07:27/28	05:52 20:36		05:40 20:57	06:22-06:56/34
21	07:41 17:17	07:07 17:57		07:20 19:30	07:54-08:35/41	06:28 20:04	06:59-07:28/29	05:51 20:37		05:40 20:58	06:22-06:56/34
22	07:41 17:18	07:05 17:58		07:19 19:31	07:44-07:52/8 08:34-08:42/8	06:27 20:05	06:58-07:27/29	05:50 20:38		05:41 20:58	06:23-06:57/34
23	07:40 17:19	07:04 17:59		07:17 19:32	07:40-08:33/53	06:25 20:06	06:58-07:28/30	05:49 20:39		05:41 20:58	06:23-06:57/34
24	07:39 17:20	07:02 18:00		07:15 19:34	07:39-08:33/54	06:24 20:07	06:58-07:28/30	05:49 20:40		05:41 20:58	06:23-06:57/34
25	07:38 17:22	07:01 07:37-07:51/14		07:13 19:35	07:37-08:32/55	06:22 20:09	06:58-07:27/29	05:48 20:41		05:41 20:58	06:24-06:58/34
26	07:38 17:23	06:59 07:34-07:55/21		07:12 19:36	07:35-08:31/56	06:21 20:10	06:58-07:27/29	05:47 20:41		05:42 20:59	06:24-06:58/34
27	07:37 17:24	06:57 07:31-07:56/25		07:10 19:37	07:34-08:30/56	06:19 20:11	06:58-07:26/28	05:46 20:42		05:42 20:59	06:24-06:57/33
28	07:36 17:25	06:56 07:30-07:59/29		07:08 19:38	07:34-08:29/55	06:18 20:12	06:59-07:25/26	05:46 20:43		05:42 20:59	06:25-06:58/33
29	07:35 17:27			07:07 19:39	07:33-08:28/55	06:16 20:13	06:58-07:24/26	05:45 20:44		05:43 20:59	06:25-06:57/32
30	07:34 17:28			07:05 19:40	07:32-08:26/54	06:15 20:14	06:59-07:23/24	05:44 20:45		05:43 20:59	06:26-06:58/32
31	07:33 17:29			07:03 19:42	07:31-08:24/53			05:44 20:46			
Potential sun hours		294		370		401		452		457	
Sum of minutes with flicker		0	89	1909		818		70		839	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 11:06 AM / 30

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110**WTG:** 43 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (142)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

July			August			September			October			November			December		
1	05:44	06:26-06:57/31	06:09			06:42	07:33-07:53/20		07:14	07:38-08:08/30	18:17-18:38/21	06:50		07:27			
	20:59		20:39			19:53			19:00	08:07-08:40/33		17:12		16:46			
2	05:44	06:28-06:57/29	06:10			06:43	07:31-07:54/23		07:15	07:39-08:04/25	18:17-18:36/19	06:51		07:28			
	20:58		20:38			19:51			18:59	08:03-08:40/37		17:10		16:46			
3	05:45	06:28-06:56/28	06:11			06:44	07:29-07:55/26		07:16	07:41-08:40/59		06:53		07:29			
	20:58		20:37			19:49			18:57	18:16-18:34/18		17:09		16:45			
4	05:45	06:29-06:56/27	06:12			06:45	07:28-07:55/27		07:17	07:41-08:39/58		06:54		07:30			
	20:58		20:36			19:48			18:55	18:16-18:32/16		17:08		16:45			
5	05:46	06:30-06:55/25	06:13			06:46	07:27-07:56/29		07:18	07:43-08:40/57		06:55		07:31			
	20:58		20:34			19:46			18:53	18:17-18:30/13		17:07		16:45			
6	05:47	06:31-06:54/23	06:14			06:47	07:26-07:56/30		07:19	07:44-08:39/55		06:56		07:32			
	20:58		20:33			19:44			18:52	18:19-18:29/10		17:05		16:45			
7	05:47	06:32-06:53/21	06:15			06:48	07:25-07:56/31		07:20	07:46-08:39/53		06:58		07:33			
	20:57		20:32			19:43			18:50	18:20-18:27/7		17:04		16:45			
8	05:48	06:34-06:52/18	06:16	07:17-07:24/7		06:49	07:25-07:56/31		07:22	07:48-08:38/50		06:59		07:34			
	20:57		20:31			19:41			18:48	18:22-18:25/3		17:03		16:45			
9	05:49	06:36-06:50/14	06:17	07:14-07:27/13		06:50	07:24-07:56/32		07:23	07:50-08:37/47		07:00		07:34			
	20:57		20:29			19:39	07:59-08:10/11		18:47			17:02		16:45			
10	05:49	06:39-06:47/8	06:18	07:12-07:29/17		06:51	07:24-08:13/49		07:24	07:53-08:36/43		07:01		07:35			
	20:56		20:28			19:37			18:45			17:01		16:45			
11	05:50		06:19	07:10-07:30/20		06:52	07:24-08:15/51		07:25	07:59-08:34/35		07:03		07:36			
	20:56		20:27			19:36			18:43			17:00		16:45			
12	05:51		06:21	07:09-07:31/22		06:53	07:24-08:16/52		07:26	08:01-08:34/33		07:04		07:37			
	20:55		20:25			19:34			18:42			16:59		16:45			
13	05:52		06:22	07:08-07:32/24		06:54	07:23-08:17/54		07:27	08:02-08:32/30		07:05		07:38			
	20:55		20:24			19:32			18:40			16:58		16:45			
14	05:52		06:23	07:07-07:33/26		06:56	07:23-08:18/55		07:28	08:03-08:30/27		07:06		07:39			
	20:54		20:23			19:30			18:38			16:57		16:45			
15	05:53		06:24	07:06-07:33/27		06:57	07:23-08:19/56		07:30	08:04-08:28/24		07:08		07:39			
	20:54		20:21			19:29			18:37			16:56		16:45			
16	05:54		06:25	07:05-07:34/29		06:58	07:23-08:19/56		07:31	08:06-08:25/19		07:09		07:40			
	20:53		20:20			19:27			18:35			16:55		16:46			
17	05:55		06:26	07:05-07:34/29		06:59	07:23-08:19/56		07:32	08:11-08:22/11		07:10		07:41			
	20:53		20:18			19:25			18:33			16:54		16:46			
18	05:56		06:27	07:04-07:34/30		07:00	07:24-08:19/55		07:33			07:11		07:41			
	20:52		20:17			19:23			18:32			16:53		16:46			
19	05:57		06:28	07:04-07:34/30		07:01	07:25-08:19/54		07:34			07:13		07:42			
	20:51		20:15			19:21			18:30			16:53		16:47			
20	05:57		06:29	07:04-07:33/29		07:02	07:26-08:19/53		07:35			07:14		07:43			
	20:50		20:14			19:20			18:29			16:52		16:47			
21	05:58		06:30	07:04-07:33/29		07:03	07:28-08:19/51		07:37			07:15		07:43			
	20:50		20:12			19:18	08:21-08:25/4		18:27			16:51		16:47			
22	05:59		06:31	07:04-07:33/29		07:04	07:38-08:19/41		07:38			07:16		07:44			
	20:49		20:11			19:16	08:19-08:30/11		18:26			16:51		16:48			
23	06:00		06:32	07:04-07:32/28		07:05	07:37-08:18/41		07:39			07:17		07:44			
	20:48		20:09			19:14	08:18-08:33/15		18:24			16:50		16:48			
24	06:01		06:33	07:04-07:31/27		07:06	07:38-08:18/40 18:27-18:35/8		07:40			07:19		07:45			
	20:47		20:08			19:13	08:18-08:35/17		18:23			16:49		16:49			
25	06:02		06:34	07:05-07:30/25		07:07	07:37-08:18/41 18:23-18:37/14		07:41			07:20		07:45			
	20:46		20:06			19:11	08:18-08:37/19		18:21			16:49		16:50			
26	06:03		06:35	07:05-07:29/24		07:08	07:37-08:17/40 18:22-18:40/18		07:43			07:21		07:46			
	20:45		20:04			19:09	08:17-08:38/21		18:20			16:48		16:50			
27	06:04		06:36	07:06-07:27/21		07:09	07:36-08:16/40 18:21-18:40/19		07:44			07:22		07:46			
	20:44		20:03			19:07	08:15-08:39/24		18:18			16:48		16:51			
28	06:05		06:38	07:08-07:25/17		07:10	07:36-08:15/39 18:19-18:41/22		07:45			07:23		07:46			
	20:43		20:01			19:06	08:14-08:39/25		18:17			16:47		16:52			
29	06:06		06:39	07:10-07:22/12		07:12	07:37-08:13/36 18:18-18:41/23		07:46			07:24		07:46			
	20:42		20:00			19:04	08:12-08:40/28		18:16			16:47		16:52			
30	06:07		06:40	07:39-07:47/8		07:13	07:37-08:11/34 18:17-18:39/22		07:48			07:25		07:47			
	20:41		19:56			19:02	08:10-08:40/30		18:14			16:46		16:53			
31	06:08		06:41	07:35-07:51/16					07:49					07:47			
	20:40		19:55						18:13					16:54			
Potential sun hours	464		431			375			343			294		283			
Sum of minutes with flicker	224		539			1571			832			0		0			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 11:06 AM / 31

Licensed user:

EDR

217 Montgomery St.
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(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110WTG: 47 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (143)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

		January	February	March	April	May	June	July	August	September	October	November	December			
1	07:47 16:55	07:32 17:31	06:54 18:07	07:01 19:43	06:14 20:15		05:43 20:47	06:17-06:59/42 20:59	05:44 20:39	06:21-07:04/43 20:39	06:09 20:39	06:46-06:56/10 20:39	06:42 19:53	07:14 19:00	06:50 17:12	07:27 16:46
2	07:47 16:56	07:31 17:32	06:53 18:08	07:00 19:44	06:12 20:17		05:43 20:48	06:16-06:59/43 20:59	05:44 20:38	06:21-07:05/44 20:38	06:10 20:38		06:43 19:51	07:15 18:59	06:51 17:10	07:28 16:46
3	07:47 16:57	07:30 17:33	06:51 18:09	06:58 19:45	06:11 20:18		05:42 20:48	06:16-06:59/43 20:58	05:45 20:37	06:21-07:05/44 20:37	06:11 20:37		06:44 19:49	07:16 18:57	06:53 17:09	07:29 16:45
4	07:47 16:58	07:29 17:35	06:49 18:10	06:56 19:46	06:10 20:19		05:42 20:49	06:15-06:59/44 20:58	05:45 20:36	06:22-07:06/44 20:36	06:12 20:36		06:45 19:48	07:17 18:55	06:54 17:08	07:30 16:45
5	07:47 16:59	07:28 17:36	06:48 18:11	06:54 19:47	06:08 20:20		05:42 20:50	06:16-06:59/43 20:58	05:46 20:35	06:22-07:05/43 20:35	06:13 20:35		06:46 19:46	07:18 18:53	06:55 17:07	07:31 16:45
6	07:47 17:00	07:27 17:37	06:46 18:13	06:53 19:48	06:07 20:21		05:41 20:50	06:16-07:00/44 20:58	05:47 20:33	06:22-07:06/44 20:33	06:14 20:33		06:47 19:44	07:19 18:52	06:56 17:06	07:32 16:45
7	07:47 17:01	07:25 17:39	06:44 18:14	06:51 19:49	06:06 20:22		05:41 20:51	06:16-07:00/44 20:57	05:47 20:32	06:22-07:05/43 20:32	06:15 20:32		06:48 19:43	07:20 18:50	06:58 17:04	07:33 16:45
8	07:47 17:02	07:24 17:40	07:43 19:15	06:49 19:51	06:05 20:23		05:41 20:52	06:16-06:59/43 20:57	05:48 20:31	06:23-07:06/43 20:31	06:16 20:31		06:49 19:41	07:22 18:48	06:59 17:03	07:34 16:45
9	07:47 17:03	07:23 17:41	07:41 19:16	06:48 19:52	06:03 20:24		05:41 20:52	06:16-07:00/44 20:57	05:49 20:30	06:23-07:07/44 20:29	06:17 20:29		06:50 19:39	07:23 18:47	07:00 17:02	07:35 16:45
10	07:46 17:04	07:22 17:42	07:39 19:17	06:46 19:53	06:02 20:25		05:40 20:53	06:16-07:00/44 20:56	05:49 20:28	06:24-07:06/42 20:28	06:18 20:28		06:51 19:37	07:24 18:45	07:01 17:01	07:35 16:45
11	07:46 17:05	07:21 17:44	07:38 19:19	06:44 19:54	06:01 20:26	06:38-06:42/4	05:40 20:54	06:17-07:00/43 20:56	05:50 20:27	06:24-07:07/43 20:27	06:19 20:27		06:52 19:36	07:25 18:43	07:03 17:00	07:36 16:45
12	07:46 17:06	07:19 17:45	07:36 19:20	06:43 19:55	06:00 20:27	06:34-06:46/12	05:40 20:54	06:17-07:00/43 20:55	05:51 20:25	06:24-07:07/43 20:25	06:21 20:25		06:53 19:34	07:26 18:42	07:04 16:59	07:37 16:45
13	07:46 17:07	07:18 17:46	07:34 19:21	06:41 19:56	05:59 20:29	06:32-06:49/17	05:40 20:55	06:17-07:01/44 20:55	05:52 20:54	06:25-07:07/42 20:24	06:22 20:24		06:54 19:32	07:27 18:40	07:05 16:58	07:38 16:45
14	07:45 17:08	07:17 17:48	07:33 19:22	06:39 19:57	05:58 20:30	06:30-06:50/20	05:40 20:55	06:17-07:01/44 20:54	05:52 20:54	06:25-07:07/42 20:23	06:23 20:23		06:56 19:30	07:28 18:38	07:06 16:57	07:39 16:45
15	07:45 17:09	07:15 17:49	07:31 19:23	06:38 19:58	05:57 20:31	06:29-06:52/23	05:40 20:56	06:18-07:01/43 20:54	05:53 20:54	06:26-07:07/41 20:21	06:24 20:21		06:57 19:29	07:30 18:37	07:08 16:56	07:39 16:45
16	07:44 17:10	07:14 17:50	07:29 19:24	06:36 20:00	05:56 20:32	06:27-06:53/26	05:40 20:56	06:18-07:01/43 20:53	05:54 20:30	06:27-07:07/40 20:20	06:25 20:20		06:58 19:27	07:31 18:35	07:09 16:55	07:40 16:46
17	07:44 17:12	07:12 17:52	07:27 19:26	06:35 20:00	05:55 20:33	06:26-06:54/28	05:40 20:56	06:18-07:01/43 20:53	05:55 20:33	06:28-07:07/39 20:18	06:26 20:18		06:59 19:25	07:32 18:33	07:10 16:54	07:41 16:46
18	07:43 17:13	07:11 17:53	07:26 19:27	06:33 20:01	05:54 20:34	06:26-06:54/28	05:40 20:57	06:18-07:01/43 20:52	05:56 20:22	06:29-07:08/39 20:17	06:27 20:17		07:00 19:23	07:33 18:32	07:11 16:53	07:42 16:46
19	07:43 17:14	07:10 17:54	07:24 19:28	06:31 20:02	05:53 20:35	06:25-06:55/30	05:40 20:57	06:18-07:01/43 20:51	05:57 20:21	06:30-07:08/38 20:15	06:28 20:15		07:01 19:21	07:34 18:30	07:13 16:53	07:42 16:47
20	07:42 17:15	07:08 17:55	07:22 19:29	06:30 20:03	05:52 20:36	06:24-06:55/31	05:40 20:57	06:18-07:01/43 20:50	05:57 20:20	06:30-07:07/37 20:14	06:29 20:14		07:02 19:20	07:35 18:29	07:14 16:52	07:43 16:47
21	07:41 17:17	07:07 17:57	07:20 19:30	06:28 20:04	05:51 20:37	06:24-06:56/32	05:40 20:58	06:18-07:01/43 20:50	05:58 20:50	06:32-07:06/34 20:12	06:30 20:12		07:03 19:18	07:37 18:27	07:15 16:51	07:43 16:47
22	07:41 17:18	07:05 17:58	07:19 19:31	06:27 20:05	05:50 20:38	06:23-06:57/34	05:41 20:58	06:19-07:02/43 20:49	05:59 20:49	06:34-07:06/32 20:11	06:31 20:11		07:04 19:16	07:38 18:26	07:16 16:51	07:44 16:48
23	07:40 17:19	07:04 17:59	07:17 19:32	06:25 20:06	05:49 20:39	06:21-06:57/36	05:41 20:58	06:19-07:02/43 20:48	06:00 20:48	06:34-07:06/32 20:09	06:32 20:09		07:05 19:14	07:39 18:24	07:17 16:50	07:44 16:48
24	07:39 17:20	07:02 18:00	07:15 19:34	06:24 20:08	05:49 20:40	06:20-06:57/37	05:41 20:58	06:19-07:02/43 20:47	06:01 20:47	06:35-07:06/31 20:08	06:33 20:08		07:06 19:13	07:40 18:23	07:19 16:49	07:45 16:49
25	07:39 17:22	07:01 18:02	07:13 19:35	06:22 20:09	05:48 20:41	06:20-06:58/38	05:41 20:59	06:20-07:03/43 20:46	06:02 20:46	06:36-07:05/29 20:06	06:34 20:06		07:07 19:11	07:41 18:21	07:20 16:49	07:45 16:50
26	07:38 17:23	06:59 18:03	07:12 19:36	06:21 20:10	05:47 20:42	06:19-06:58/39	05:42 20:59	06:20-07:03/43 20:45	06:03 20:45	06:37-07:05/28 20:04	06:35 20:04		07:08 19:09	07:43 18:20	07:21 16:48	07:46 16:50
27	07:37 17:24	06:57 18:04	07:10 19:37	06:19 20:11	05:46 20:42	06:18-06:58/40	05:42 20:59	06:20-07:03/43 20:44	06:04 20:44	06:37-07:04/27 20:03	06:36 20:03		07:09 19:07	07:44 18:18	07:22 16:48	07:46 16:51
28	07:36 17:25	06:56 18:05	07:08 19:38	06:18 20:12	05:46 20:43	06:18-06:59/41	05:42 20:59	06:20-07:04/44 20:43	06:05 20:43	06:38-07:03/25 20:01	06:38 20:01		07:11 19:06	07:45 18:17	07:23 16:47	07:46 16:52
29	07:35 17:27		07:07 19:39	06:16 20:13	05:45 20:44	06:17-06:58/41	05:43 20:59	06:20-07:04/44 20:42	06:06 20:42	06:40-07:02/22 20:00	06:39 20:00		07:12 19:04	07:46 18:16	07:24 16:47	07:46 16:52
30	07:34 17:28		07:05 19:40	06:15 20:14	05:44 20:45	06:17-06:59/42	05:43 20:59	06:21-07:04/43 20:41	06:07 20:41	06:41-07:00/19 19:56	06:40 19:56		07:13 19:02	07:48 18:14	07:25 16:46	07:47 16:53
31	07:33 17:29		07:03 19:42		05:44 20:46	06:16-06:59/43			06:08 20:40	06:43-06:59/16 19:55	06:41 19:55			07:49 18:13		07:47 16:54
Potential sun hours		294	295	370	401	452	457	464	431	431	375	343	294	283		
Sum of minutes with flicker		0	0	0	0	642	1298	1133	10	10	0	0	0	0		

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 11:06 AM / 32

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Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110WTG: 49 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (150)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June
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1	07:47	08:41-09:34/53	14:09-14:21/12	07:32	08:15-08:41/26	16:17-17:06/49	06:54	07:42-08:06/24	07:01	06:14	05:43
	16:55	09:35-09:48/13	14:48-16:20/92	17:31	08:41-08:55/14		18:07	17:20-17:44/24	19:43	20:15	20:47
2	07:47	08:42-09:35/53	14:12-14:20/8	07:31	08:14-08:42/28	16:18-17:07/49	06:53	07:43-08:04/21	07:00	06:12	05:43
	16:56	09:37-09:47/10	14:48-16:21/93	17:32	08:42-08:55/13		18:08	17:19-17:44/25	19:44	20:17	20:48
3	07:47	08:42-09:35/53	14:49-16:21/92	07:30	08:14-08:43/29	16:18-17:08/50	06:51	07:44-08:04/20	06:58	06:11	05:42
	16:57	09:39-09:46/7		17:33	08:43-08:55/12		18:09	17:20-17:45/25	19:45	20:18	20:48
4	07:47	08:42-09:36/54		07:29	08:14-08:44/30	16:19-17:08/49	06:49	07:45-08:02/17	06:56	06:10	05:42
	16:58	14:50-16:22/92		17:35	08:44-08:54/10		18:10	17:20-17:44/24	19:46	20:19	20:49
5	07:47	08:43-09:36/53		07:28	08:13-08:45/32	16:19-17:08/49	06:48	07:47-07:59/12	06:54	06:08	05:42
	16:59	14:51-16:23/92		17:36	08:45-08:53/8		18:11	17:20-17:43/23	19:47	20:20	20:50
6	07:47	08:43-09:37/54		07:27	08:12-08:44/32	16:20-17:08/48	06:46	17:21-17:42/21	06:53	06:07	05:41
	17:00	14:52-16:23/91		17:37	08:44-08:51/7		18:13		19:48	20:21	20:50
7	07:47	08:44-09:37/53		07:25	08:13-08:45/32	16:21-17:08/47	06:44	17:22-17:41/19	06:51	06:06	05:41
	17:01	14:54-16:24/90		17:39	08:45-08:50/5		18:14		19:49	20:22	20:51
8	07:47	08:45-09:38/53	15:26-16:25/59	07:24	08:13-08:45/32	16:22-17:08/46	07:43	18:23-18:39/16	06:49	06:05	05:41
	17:02	14:55-15:25/30		17:40	08:45-08:47/2		19:15		19:51	20:23	20:52
9	07:47	08:44-09:38/54	15:26-16:25/59	07:23	08:13-08:44/31		07:41	18:26-18:37/11	06:48	06:03	05:40
	17:03	14:55-15:24/29		17:41	16:23-17:07/44		19:16		19:52	20:24	20:52
10	07:46	08:45-09:38/53	15:27-16:25/58	07:22	08:13-08:43/30		07:39		06:46	06:02	05:40
	17:04	14:57-15:24/27		17:42	16:25-17:07/42		19:17		19:53	20:25	20:53
11	07:46	08:35-08:38/3	14:59-15:24/25	07:21	08:13-08:43/30	16:45-17:06/21	07:38		06:44	06:01	05:40
	17:05	08:46-09:39/53	15:29-16:26/57	17:44	16:27-16:44/17		19:19		19:54	20:26	20:54
12	07:46	08:31-08:41/10	15:00-15:22/22	07:19	08:14-08:43/29	16:46-17:05/19	07:36		06:43	06:00	05:40
	17:06	08:46-09:38/52	15:29-16:31/62	17:45	16:30-16:42/12		19:20		19:55	20:27	20:54
13	07:46	08:30-08:43/13	15:02-15:22/20	07:18	08:14-08:42/28		07:34		06:41	05:59	05:40
	17:07	08:47-09:39/52	15:31-16:35/64	17:46	16:47-17:03/16		19:21		19:56	20:29	20:55
14	07:45	08:29-08:44/15	15:04-15:20/16	07:17	08:15-08:41/26		07:33		06:39	05:58	05:40
	17:08	08:47-09:39/52	15:32-16:36/64	17:48	16:50-17:02/12		19:22		19:57	20:30	20:55
15	07:45	08:29-08:46/17	15:08-15:18/10	07:15	08:16-08:40/24		07:31		06:38	05:57	05:40
	17:09	08:48-09:39/51	15:34-16:39/65	17:49	16:54-16:56/2		19:23		19:58	20:31	20:56
16	07:44	08:28-08:47/19	15:36-16:40/64	07:14	08:17-08:39/22		07:29		06:36	05:56	05:40
	17:10	08:48-09:39/51		17:50			19:24		20:00	20:32	20:56
17	07:44	08:28-09:39/71		07:12	07:52-08:00/8		07:27		06:35	05:55	05:40
	17:12	15:39-16:45/66		17:51	08:19-08:38/19		19:26		20:00	20:33	20:56
18	07:43	08:27-09:39/72		07:11	07:48-08:03/15		07:26		06:33	05:54	05:40
	17:13	15:45-16:47/62		17:53	08:21-08:35/14		19:27		20:01	20:34	20:57
19	07:43	08:26-09:38/72		07:10	07:47-08:05/18		07:24		06:31	05:53	05:40
	17:14	15:47-16:48/61		17:54	08:26-08:30/4		19:28		20:02	20:35	20:57
20	07:42	08:26-09:39/73	16:01-16:50/49	07:08	07:45-08:06/21		07:22		06:30	05:52	05:40
	17:15	15:51-15:59/8		17:55			19:29		20:03	20:36	20:58
21	07:41	08:26-09:38/72		07:07	07:44-08:07/23		07:20		06:28	05:51	05:40
	17:17	16:01-16:51/50		17:57			19:30		20:04	20:37	20:58
22	07:41	08:26-09:37/71		07:05	07:43-08:07/24		07:19		06:27	05:50	05:41
	17:18	16:02-16:52/50		17:58	17:29-17:35/6		19:31		20:05	20:38	20:58
23	07:40	08:26-08:54/28	16:03-16:53/50	07:04	07:43-08:08/25		07:17		06:25	05:49	05:41
	17:19	08:56-09:37/41		17:59	17:26-17:37/11		19:32		20:06	20:39	20:58
24	07:39	08:26-08:55/29	16:05-16:55/50	07:02	07:42-08:08/26		07:15		06:24	05:48	05:41
	17:20	08:57-09:36/39		18:00	17:24-17:38/14		19:34		20:08	20:40	20:58
25	07:39	08:26-08:55/29	16:06-16:56/50	07:01	07:42-08:08/26		07:13		06:22	05:48	05:41
	17:22	08:59-09:35/36		18:02	17:22-17:39/17		19:35		20:09	20:41	20:59
26	07:38	08:25-08:55/30	16:08-16:58/50	06:59	07:42-08:08/26		07:12		06:21	05:47	05:42
	17:23	09:01-09:34/33		18:03	17:22-17:41/19		19:36		20:10	20:42	20:59
27	07:37	08:21-08:56/35	16:11-16:59/48	06:57	07:41-08:07/26		07:10		06:19	05:46	05:42
	17:24	09:12-09:32/20		18:04	17:21-17:41/20		19:37		20:11	20:42	20:59
28	07:36	08:19-08:56/37	16:16-17:00/44	06:56	07:42-08:07/25		07:08		06:18	05:46	05:42
	17:25	09:15-09:30/15		18:05	17:21-17:43/22		19:38		20:12	20:43	20:59
29	07:35	08:17-08:56/39	16:16-17:02/46				07:07		06:16	05:45	05:43
	17:27	09:19-09:26/7					19:39		20:13	20:44	20:59
30	07:34	08:16-08:39/23	16:16-17:03/47				07:05		06:15	05:44	05:43
	17:28	08:39-08:56/17					19:40		20:14	20:45	20:59
31	07:33	08:15-08:40/25	16:17-17:04/47				07:03			05:44	
	17:29	08:40-08:56/16					19:42			20:46	
Potential sun hours		294		295			370		401	452	457
Sum of minutes with flicker		4052		1513			282		0	0	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 11:06 AM / 33

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110WTG: 49 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (150)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	[July]	[August]	[September]	[October]		[November]		[December]
1	05:44 20:59	06:09 20:39	06:42 19:53	07:14 19:00		06:50 07:43-08:13/30 17:12 15:54-16:36/42		07:27 08:16-08:20/4 14:41-15:05/24 16:46 08:28-09:21/53 15:11-16:08/57
2	05:44 20:59	06:10 20:38	06:43 19:51	07:15 18:59		06:51 07:42-08:13/31 17:10 15:52-16:37/45		07:28 08:28-09:21/53 15:11-16:08/57 16:46 14:40-15:07/27
3	05:45 20:58	06:11 20:37	06:44 19:49	07:16 18:57		06:53 07:43-08:15/32 15:52-16:38/46 17:09 08:15-08:17/2		07:29 08:28-09:22/54 15:10-16:09/59 16:45 14:40-15:08/28
4	05:45 20:58	06:12 20:36	06:45 19:48	07:17 18:04-18:12/8 18:55		06:54 07:42-08:14/32 15:50-16:38/48 17:08 08:14-08:20/6		07:30 08:29-09:22/53 15:10-16:09/59 16:45 14:39-15:09/30
5	05:46 20:58	06:13 20:35	06:46 19:46	07:18 18:00-18:14/14 18:53		06:55 07:42-08:14/32 15:49-16:38/49 17:07 08:14-08:21/7		07:31 08:29-09:22/53 16:45 14:39-16:09/90
6	05:47 20:58	06:14 20:33	06:47 19:44	07:19 17:59-18:17/18 18:52		06:56 07:43-08:14/31 15:49-16:38/49 17:05 08:14-08:23/9		07:32 08:29-09:23/54 16:45 14:38-16:09/91
7	05:47 20:57	06:15 20:32	06:48 19:43	07:20 17:57-18:18/21 18:50		06:58 07:43-08:14/31 15:49-16:38/49 17:04 08:14-08:24/10		07:33 08:30-09:23/53 16:45 14:38-16:10/92
8	05:48 20:57	06:16 20:31	06:49 19:41	07:22 08:25-08:32/7 18:48 17:56-18:18/22		06:59 07:44-08:13/29 15:48-16:37/49 17:03 08:13-08:25/12		07:34 08:30-09:24/54 16:45 14:38-16:10/92
9	05:49 20:57	06:17 20:29	06:50 19:39	07:23 08:21-08:35/14 18:47 17:55-18:18/23		07:00 07:45-08:13/28 15:48-16:38/50 17:02 08:13-08:26/13		07:35 08:31-09:24/53 14:38-16:10/92 16:45 09:28-09:35/7
10	05:49 20:56	06:18 20:28	06:51 19:37	07:24 08:19-08:37/18 18:45 17:54-18:18/24		07:01 07:46-08:12/26 15:48-16:37/49 17:01 08:12-08:26/14		07:35 08:32-09:25/53 14:02-14:09/7 16:45 09:27-09:37/10 14:38-16:11/93
11	05:50 20:56	06:19 20:27	06:52 19:36	07:25 08:18-08:39/21 18:43 17:53-18:18/25		07:03 07:46-08:11/25 15:48-16:35/47 17:00 08:11-08:27/16		07:36 08:32-09:25/53 14:00-14:12/12 16:45 09:26-09:39/13 14:39-16:11/92
12	05:51 20:55	06:21 20:25	06:53 19:34	07:26 08:17-08:39/22 18:42 17:54-18:19/25		07:04 07:48-08:11/23 15:48-16:35/47 16:59 08:11-08:28/17		07:37 08:32-09:40/68 14:38-16:11/93 16:45 13:58-14:13/15
13	05:52 20:55	06:22 20:24	06:54 19:32	07:27 08:15-08:40/25 18:40 17:53-18:17/24		07:05 07:49-08:28/39 15:48-16:33/45 16:58 08:51-08:58/7		07:38 08:33-09:41/68 14:38-16:11/93 16:45 13:58-14:15/17
14	05:52 20:54	06:23 20:23	06:56 19:30	07:28 08:14-08:40/26 18:38 17:53-18:15/22		07:06 07:51-08:28/37 15:48-16:32/44 16:57 08:47-09:02/15		07:39 08:33-09:42/69 14:39-16:12/93 16:45 13:57-14:16/19
15	05:53 20:54	06:24 20:21	06:57 19:29	07:30 08:14-08:40/26 18:37 17:53-18:13/20		07:08 07:54-08:29/35 15:43-16:32/49 16:56 08:45-09:05/20		07:39 08:34-09:44/70 14:39-16:12/93 16:45 13:57-14:18/21
16	05:54 20:53	06:25 20:20	06:58 19:27	07:31 08:13-08:39/26 18:35 17:54-18:11/17		07:09 07:58-08:28/30 15:41-16:30/49 16:55 08:34-09:07/33		07:40 08:34-09:44/70 14:39-16:12/93 16:46 13:57-14:18/21
17	05:55 20:53	06:26 20:18	06:59 19:25	07:32 08:14-08:40/26 18:33 17:55-18:11/16		07:10 07:59-08:28/29 15:39-16:29/50 16:54 08:32-09:08/36		07:41 08:35-09:45/70 14:40-16:13/93 16:46 13:57-14:19/22
18	05:56 20:52	06:27 20:17	07:00 19:23	07:33 08:14-08:39/25 18:32 17:56-18:09/13		07:11 08:00-08:29/29 15:39-16:29/50 16:53 08:31-09:10/39		07:42 08:36-09:46/70 14:40-16:14/94 16:46 13:57-14:21/24
19	05:57 20:51	06:28 20:15	07:01 19:21	07:34 08:14-08:38/24 18:30 17:58-18:07/9		07:13 08:00-08:28/28 15:38-16:28/50 16:53 08:30-09:11/41		07:42 08:36-09:46/70 14:40-16:13/93 16:47 13:57-14:21/24
20	05:57 20:50	06:29 20:14	07:02 19:20	07:35 08:14-08:38/24 18:29 18:01-18:05/4		07:14 08:01-09:12/71 16:52 15:37-16:27/50		07:43 08:36-09:47/71 14:41-16:14/93 16:47 13:58-14:22/24
21	05:58 20:50	06:30 20:12	07:03 19:18	07:37 08:15-08:37/22 18:27		07:15 08:02-09:14/72 16:51 15:37-16:27/50		07:43 08:36-09:47/71 14:41-16:14/93 16:47 13:57-14:22/25
22	05:59 20:49	06:31 20:11	07:04 19:16	07:38 08:16-08:36/20 18:26		07:16 08:02-09:15/73 15:37-16:26/49 16:50 15:27-15:35/8		07:44 08:37-09:48/71 14:42-16:15/93 16:48 13:58-14:23/25
23	06:00 20:48	06:32 20:09	07:05 19:14	07:39 08:17-08:34/17 18:24 08:54-09:02/8		07:17 08:03-09:15/72 16:50 15:24-16:25/61		07:44 08:37-09:48/71 14:42-16:15/93 16:48 13:59-14:23/24
24	06:01 20:47	06:33 20:08	07:06 19:13	07:40 08:20-08:33/13 18:23 08:51-09:06/15		07:19 08:04-09:16/72 16:49 15:22-16:24/62		07:45 08:39-09:49/70 14:43-16:16/93 16:49 14:00-14:24/24
25	06:02 20:46	06:34 20:06	07:07 19:11	07:41 08:23-08:29/6 18:21 08:49-09:08/19		07:20 08:06-09:17/71 16:49 15:18-16:23/65		07:45 08:39-09:49/70 14:43-16:16/93 16:50 14:00-14:24/24
26	06:03 20:45	06:35 20:04	07:08 19:09	07:43 08:47-09:09/22 18:20		07:21 08:06-08:26/20 15:15-16:19/64 16:48 08:27-09:18/51		07:46 08:39-09:49/70 14:44-16:17/93 16:50 14:01-14:23/22
27	06:04 20:44	06:36 20:03	07:09 19:07	07:44 08:45-09:10/25 18:18 17:22-17:28/6		07:22 08:08-08:26/18 14:47-14:57/10 16:48 08:27-09:18/51 15:13-16:18/65		07:46 08:40-09:50/70 14:45-16:18/93 16:51 14:02-14:24/22
28	06:05 20:43	06:38 20:01	07:11 19:06	07:45 08:45-09:11/26 18:17 17:19-17:32/13		07:23 08:09-08:25/16 14:44-14:59/15 16:47 08:27-09:19/52 15:12-16:17/65		07:46 08:40-09:50/70 14:45-16:18/93 16:52 14:03-14:24/21
29	06:06 20:42	06:39 20:00	07:12 19:04	07:46 08:44-09:12/28 18:16 17:16-17:33/17		07:24 08:10-08:23/13 14:42-15:01/19 16:47 08:27-09:19/52 15:11-16:15/64		07:46 08:40-09:49/69 14:46-16:19/93 16:52 14:04-14:24/20
30	06:07 20:41	06:40 19:56	07:13 19:02	07:48 08:43-09:12/29 17:15-17:34/19 18:14 16:58-17:11/13		07:25 08:13-08:23/10 14:41-15:03/22 16:46 08:28-09:20/52 15:11-16:13/62		07:47 08:40-09:49/69 14:46-16:19/93 16:53 14:05-14:23/18
31	06:08 20:40	06:41 19:55		07:49 08:43-09:13/30 18:13 16:56-17:36/40				07:47 08:41-09:49/68 14:47-16:20/93 16:54 14:07-14:23/16
Potential sun hours	464	431	375	343		294		283
Sum of minutes with flicker	0	0	0	977		3278		5306

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 11:06 AM / 34

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110WTG: 50 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (141)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	January		February		March		April		May		June		July		August		September		October		November		December	
1	07:47	09:02-09:30/28	07:32	06:54	07:01	06:14	05:43						05:44	06:25-06:38/13	06:09	06:42	07:14	06:50					07:27	08:50-09:15/25
	16:55		17:31	18:07	19:43	20:15	20:47						20:59		20:39	19:53	19:00	17:12					16:46	
2	07:47	09:02-09:31/29	07:31	06:53	07:00	06:12	05:43						05:44	06:26-06:38/12	06:10	06:43	07:15	06:51					07:28	08:50-09:16/26
	16:56		17:32	18:08	19:44	20:17	20:48						20:59		20:38	19:51	18:59	17:10					16:46	
3	07:47	09:03-09:31/28	07:30	06:51	06:58	06:11	05:43						05:45	06:26-06:37/11	06:11	06:44	07:16	06:53					07:29	08:50-09:17/27
	16:57		17:33	18:09	19:45	20:18	20:48						20:58		20:37	19:49	18:57	17:09					16:45	
4	07:47	09:03-09:32/29	07:29	06:49	06:56	06:10	05:42						05:45	06:28-06:36/8	06:12	06:45	07:17	06:54					07:30	08:50-09:17/27
	16:58		17:35	18:10	19:46	20:19	20:49						20:58		20:36	19:48	18:55	17:08					16:45	
5	07:47	09:04-09:32/28	07:28	06:48	06:54	06:08	05:42						05:46	06:29-06:35/6	06:13	06:46	07:18	06:55					07:31	08:50-09:18/28
	16:59		17:36	18:11	19:47	20:20	20:50						20:58		20:35	19:46	18:53	17:07					16:45	
6	07:47	09:05-09:32/27	07:27	06:46	06:53	06:07	05:41						05:47		06:14	06:47	07:19	06:56					07:32	08:51-09:18/27
	17:00		17:37	18:13	19:48	20:21	20:50						20:58		20:33	19:44	18:52	17:06					16:45	
7	07:47	09:05-09:33/28	07:25	06:44	06:51	06:06	05:41	06:24-06:29/5					05:47		06:15	06:48	07:20	06:58					07:33	08:51-09:19/28
	17:01		17:39	18:14	19:49	20:22	20:51						20:57		20:32	19:43	18:50	17:04					16:45	
8	07:47	09:06-09:33/27	07:24	07:43	06:49	06:05	05:41	06:22-06:30/8					05:48		06:16	06:49	07:22	06:59					07:34	08:51-09:20/29
	17:02		17:40	19:15	19:51	20:23	20:52						20:57		20:31	19:41	18:48	17:03					16:45	
9	07:47	09:06-09:33/27	07:23	07:41	06:48	06:03	05:41	06:22-06:31/9					05:49		06:17	06:50	07:23	07:00					07:35	08:52-09:20/28
	17:03		17:41	19:16	19:52	20:24	20:52						20:57		20:29	19:39	18:47	17:02					16:45	
10	07:47	09:07-09:33/26	07:22	07:39	06:46	06:02	05:40	06:21-06:32/11					05:49		06:18	06:51	07:24	07:01					07:35	08:52-09:21/29
	17:04		17:42	19:17	19:53	20:25	20:53						20:56		20:28	19:37	18:45	17:01					16:45	
11	07:46	09:08-09:33/25	07:21	07:38	06:44	06:01	05:40	06:21-06:33/12					05:50		06:19	06:52	07:25	07:03					07:36	08:53-09:22/29
	17:05		17:44	19:19	19:54	20:26	20:54						20:56		20:27	19:36	18:43	17:00					16:45	
12	07:46	09:09-09:33/24	07:19	07:36	06:43	06:00	05:40	06:21-06:34/13					05:51		06:21	06:53	07:26	07:04					07:37	08:52-09:21/29
	17:06		17:45	19:20	19:55	20:28	20:54						20:55		20:25	19:34	18:42	16:59					16:45	
13	07:46	09:10-09:33/23	07:18	07:34	06:41	05:59	05:40	06:20-06:35/15					05:52		06:22	06:54	07:27	07:05					07:38	08:53-09:22/29
	17:07		17:46	19:21	19:56	20:29	20:55						20:55		20:24	19:32	18:40	16:58					16:45	
14	07:45	09:10-09:32/22	07:17	07:33	06:39	05:58	05:40	06:20-06:35/15					05:52		06:23	06:56	07:28	07:06					07:39	08:53-09:23/30
	17:08		17:48	19:22	19:57	20:30	20:55						20:54		20:23	19:30	18:38	16:57					16:45	
15	07:45	09:12-09:32/20	07:15	07:31	06:38	05:57	05:40	06:20-06:36/16					05:53		06:24	06:57	07:30	07:08					07:39	08:54-09:23/29
	17:09		17:49	19:23	19:59	20:31	20:56						20:54		20:21	19:29	18:37	16:56					16:45	
16	07:44	09:13-09:31/18	07:14	07:29	06:36	05:56	05:40	06:20-06:36/16					05:54		06:25	06:58	07:31	07:09					07:40	08:54-09:23/29
	17:11		17:50	19:24	20:00	20:32	20:56						20:53		20:20	19:27	18:35	16:55					16:46	
17	07:44	09:15-09:31/16	07:12	07:27	06:35	05:55	05:40	06:20-06:36/16					05:55		06:26	06:59	07:32	07:10					07:41	08:55-09:24/29
	17:12		17:52	19:26	20:00	20:33	20:57						20:53		20:18	19:25	18:34	16:54					16:46	
18	07:43	09:16-09:29/13	07:11	07:26	06:33	05:54	05:40	06:20-06:37/17					05:56		06:27	07:00	07:33	07:11					07:42	08:55-09:25/30
	17:13		17:53	19:27	20:01	20:34	20:57						20:52		20:17	19:23	18:32	16:53					16:46	
19	07:43	09:18-09:27/9	07:10	07:24	06:31	05:53	05:40	06:20-06:37/17					05:57		06:28	07:01	07:34	07:13					07:42	08:55-09:25/30
	17:14		17:54	19:28	20:02	20:35	20:57						20:51		20:15	19:21	18:30	16:53					16:47	
20	07:42		07:08	07:22	06:30	05:52	05:40	06:20-06:37/17					05:58		06:29	07:02	07:35	07:14					07:43	08:56-09:26/30
	17:15		17:55	19:29	20:03	20:36	20:58						20:50		20:14	19:20	18:29	16:52					16:47	
21	07:41		07:07	07:20	06:28	05:51	05:40	06:20-06:37/17					05:58		06:30	07:03	07:37	07:15					07:43	08:56-09:26/30
	17:17		17:57	19:30	20:04	20:37	20:58						20:50		20:12	19:18	18:27	16:51					16:47	
22	07:41		07:05	07:19	06:27	05:50	05:41	06:21-06:38/17					05:59		06:31	07:04	07:38	07:16					07:44	08:57-09:27/30
	17:18		17:58	19:31	20:05	20:38	20:58						20:49		20:11	19:16	18:26	16:51					16:48	
23	07:40		07:04	07:17	06:25	05:49	05:41	06:21-06:38/17					06:00		06:32	07:05	07:39	07:17	08:55-09:04/9				07:44	08:57-09:27/30
	17:19		17:59	19:32	20:06	20:39	20:58						20:48		20:09	19:14	18:24	16:50					16:48	
24	07:39		07:02	07:15	06:24	05:49	05:41	06:21-06:38/17					06:01		06:33	07:06	07:40	07:19	08:53-09:06/13				07:45	08:58-09:28/30
	17:20		18:00	19:34	20:08	20:40	20:58						20:47		20:08	19:13	18:23	16:49					16:49	
25	07:39		07:01	07:13	06:22	05:48	05:41	06:22-06:38/16					06:02		06:34	07:07	07:41	07:20	08:53-09:09/16				07:45	08:58-09:28/30
	17:22		18:02	19:35	20:09	20:41	20:59						20:46		20:06	19:11	18:21	16:49					16:50	
26	07:38		06:59	07:12	06:21	05:47	05:42	06:22-06:38/16					06:03		06:35	07:08	07:43	07:21	08:52-09:10/18				07:46	08:59-09:28/29
	17:23		18:03	19:36	20:10	20:42	20:59						20:45		20:04	19:09	18:20	16:48					16:50	
27	07:37		06:57	07:10	06:19	05:46	05:42	06:22-06:38/16					06:04		06:36	07:09	07:44	07:22	08:51-09:11/20				07:46	09:00-09:29/29
	17:24		18:04	19:37	20:11	20:42	20:59						20:44		20:03	19:07	18:18	16:48					16:51	
28	07:36		06:56	07:08	06:18	05:46	05:42	06:23-06:38/15					06:05		06:38	07:11	07:45	07:23	08:50-09:12/22				07:46	09:00-09:29/29
	17:25		18:05	19:38	20:12	20:43	20:59						20:43		20:01	19:06	18:17	16:47					16:52	
29	07:35			07:07	06:16	05:45	05:43	06:23-06:38/15					06:06		06:39	07:12	07:46	07:24	08:50-09:13/23				07:46	09:00-09:29/29
	17:27			19:39	20:13	20:44	20:59						20:42		20:00	19:04	18:16	16:47					16:52	
30	07:34			07:05	06:15	05:45	05:43	06:25-06:38/13					06:07		06:40	07:13	07:48	07:25	08:51-09:15/24				07:47	09:01-09:30/29
	17:28			19:40	20:14	20:45	20:59						20:41		19:56	19:02	18:14	16:46					16:53	
31	07:33			07:03		05:44							06:08		06:41		07:49						07:47	09:01-09:30/29

Project:

2015-08-31_Arkwright Summit_SFA

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EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110WTG: 51 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (149)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

January			February			March			April			May			June		
1	07:47	15:38-16:05/27	07:32	06:54					07:01	18:28-18:55/27	06:14	18:42-19:18/36	05:43	19:39-20:20/41			
	16:55		17:31	18:06					19:43	18:55-19:16/21	20:15	19:18-19:53/35	20:47				
2	07:47	15:39-16:06/27	07:31	06:53					07:00	18:29-18:53/24	06:12	18:43-19:16/33	05:43	19:39-20:20/41			
	16:56		17:32	18:08					19:44	18:53-19:16/23	20:16	19:16-19:53/37	20:47				
3	07:47	15:39-16:06/27	07:30	06:51					06:58	18:30-18:51/21	06:11	18:44-19:15/31	05:42	19:39-20:21/42			
	16:57		17:33	18:09					19:45	18:51-19:15/24	20:18	19:15-19:55/40	20:48				
4	07:47	15:40-16:07/27	07:29	06:49					06:56	18:32-18:47/15	06:10	18:46-19:13/27	05:42	19:39-20:21/42			
	16:58		17:35	18:10					19:46	18:47-19:14/27	20:19	19:13-19:56/43	20:49				
5	07:47	15:40-16:07/27	07:28	06:48					06:54	18:42-19:15/33	06:08	18:48-19:11/23	05:42	19:39-20:21/42			
	16:59		17:36	18:11					19:47	19:15-19:17/2	20:20	19:11-19:57/46	20:50				
6	07:47	15:41-16:08/27	07:27	06:46					06:53	18:42-19:14/32	06:07	18:50-19:08/18	05:41	19:40-20:22/42			
	17:00		17:37	18:13					19:48	19:14-19:19/5	20:21	19:08-19:58/50	20:50				
7	07:47	15:41-16:08/27	07:25	06:44					06:51	18:42-19:13/31	06:06	18:54-19:04/10	05:41	19:39-20:22/43			
	17:01		17:38	18:14					19:49	19:13-19:20/7	20:22	19:06-19:59/53	20:51				
8	07:47	15:41-16:08/27	07:24	07:43					06:49	18:43-19:13/30	06:05	19:07-19:42/35	05:41	19:40-20:22/42			
	17:02		17:40	19:15					19:51	19:13-19:22/9	20:23	19:37-20:00/23	20:52				
9	07:47	15:42-16:09/27	07:23	07:41					06:48	18:44-19:11/27	06:03	19:09-19:41/32	05:40	19:40-20:23/43			
	17:03		17:41	19:16					19:52	19:11-19:23/12	20:24	19:36-20:01/25	20:52				
10	07:46	15:43-16:09/26	07:22	07:39					06:46	18:43-19:09/26	06:02	19:10-19:38/28	05:40	19:41-20:23/42			
	17:04		17:42	19:17					19:53	19:09-19:23/14	20:25	19:34-20:02/28	20:53				
11	07:46	15:44-16:10/26	07:20	07:38					06:44	18:43-19:08/25	06:01	19:12-19:37/25	05:40	19:41-20:24/43			
	17:05		17:44	19:19					19:54	19:08-19:24/16	20:26	19:33-20:03/30	20:54				
12	07:46	15:44-16:09/25	07:19	07:36					06:43	18:41-19:05/24	06:00	19:13-19:32/19	05:40	19:41-20:24/43			
	17:06		17:45	19:20					19:55	19:05-19:24/19	20:27	19:31-20:04/33	20:54				
13	07:46	15:45-16:10/25	07:18	07:34	18:42-18:51/9				06:41	18:40-19:01/21	05:59	19:16-19:30/14	05:40	19:42-20:25/43			
	17:07		17:46	19:21					19:56	19:01-19:24/23	20:29	19:29-20:05/36	20:55				
14	07:45	15:45-16:09/24	07:17	07:33	18:37-18:54/17				06:39	18:40-19:26/46	05:58	19:26-20:06/40	05:40	19:42-20:25/43			
	17:08		17:48	19:22					19:57	19:26-19:29/3	20:30		20:55				
15	07:45	15:47-16:10/23	07:15	07:31	18:34-18:56/22				06:38	18:39-19:26/47	05:57	19:26-20:07/41	05:40	19:42-20:25/43			
	17:09		17:49	19:23					19:58	19:26-19:33/7	20:31		20:56				
16	07:44	15:47-16:09/22	07:14	07:29	18:33-18:58/25				06:36	18:39-19:27/48	05:56	19:26-20:08/42	05:40	19:42-20:25/43			
	17:10		17:50	19:24					20:00	19:27-19:36/9	20:32		20:56				
17	07:44	15:49-16:09/20	07:12	07:27	18:31-18:59/28				06:35	18:38-19:26/48	05:55	19:27-20:09/42	05:40	19:43-20:26/43			
	17:12		17:51	19:26					20:00	19:26-19:37/11	20:33		20:56				
18	07:43	15:49-16:08/19	07:11	07:26	18:29-19:00/31				06:33	18:37-19:26/49	05:54	19:27-20:10/43	05:40	19:43-20:26/43			
	17:13		17:53	19:27					20:01	19:26-19:38/12	20:34		20:57				
19	07:43	15:50-16:07/17	07:10	07:24	18:28-19:00/32				06:31	18:38-19:26/48	05:53	19:28-20:11/43	05:40	19:43-20:26/43			
	17:14		17:54	19:28					20:02	19:26-19:40/14	20:35		20:57				
20	07:42	15:53-16:07/14	07:08	07:22	18:28-19:01/33				06:30	18:37-19:25/48	05:52	19:28-20:10/42	05:40	19:43-20:26/43			
	17:15		17:55	19:29					20:03	19:25-19:41/16	20:36	20:07-20:12/5	20:57				
21	07:41	15:55-16:06/11	07:07	07:20	18:26-19:01/35				06:28	18:37-19:25/48	05:51	19:29-20:12/43	05:40	19:43-20:26/43			
	17:17		17:57	19:30					20:04	19:25-19:42/17	20:37	20:10-20:12/2	20:58				
22	07:41	15:58-16:03/5	07:05	07:19	18:26-19:01/35				06:27	18:37-19:25/48	05:50	19:30-20:14/44	05:40	19:44-20:27/43			
	17:18		17:58	19:31					20:05	19:25-19:43/18	20:38	20:12-20:14/2	20:58				
23	07:40		07:04	07:17	18:25-19:02/37				06:25	18:38-19:25/47	05:49	19:31-20:14/43	05:41	19:44-20:27/43			
	17:19		17:59	19:32	19:02-19:06/4				20:06	19:25-19:44/19	20:39	20:13-20:15/2	20:58				
24	07:39		07:02	07:15	18:25-19:03/38				06:24	18:37-19:23/46	05:48	19:32-20:15/43	05:41	19:44-20:27/43			
	17:20		18:00	19:34	19:03-19:10/7				20:07	19:23-19:45/22	20:40		20:58				
25	07:38		07:01	07:13	18:25-19:02/37				06:22	18:38-19:23/45	05:48	19:33-20:15/42	05:41	19:44-20:27/43			
	17:22		18:02	19:35	19:02-19:12/10				20:09	19:23-19:46/23	20:41	20:15-20:16/1	20:58				
26	07:38		06:59	07:12	18:24-19:01/37				06:21	18:39-19:24/45	05:47	19:35-20:17/42	05:42	19:45-20:27/42			
	17:23		18:03	19:36	19:01-19:13/12				20:10	19:23-19:48/25	20:41		20:59				
27	07:37		06:57	07:10	18:24-19:00/36				06:19	18:39-19:23/44	05:46	19:37-20:17/40	05:42	19:44-20:27/43			
	17:24		18:04	19:37	19:00-19:14/14				20:11	19:22-19:48/26	20:42		20:59				
28	07:36		06:56	07:08	18:25-19:00/35				06:18	18:40-19:21/41	05:46	19:39-20:18/39	05:42	19:45-20:28/43			
	17:25		18:05	19:38	19:00-19:15/15				20:12	19:21-19:50/29	20:43		20:59				
29	07:35			07:06	18:25-18:59/34				06:16	18:40-19:19/39	05:45	19:38-20:18/40	05:43	19:45-20:28/43			
	17:27			19:39	18:59-19:16/17				20:13	19:19-19:50/31	20:44		20:59				
30	07:34			07:05	18:25-18:58/33				06:15	18:41-19:19/38	05:44	19:38-20:18/40	05:43	19:45-20:27/42			
	17:28			19:40	18:58-19:16/18				20:14	19:19-19:52/33	20:45		20:59				
31	07:33			07:03	18:26-18:56/30						05:44	19:39-20:19/40					
	17:29			19:42	18:56-19:15/19						20:46						
Potential sun hours	294		295		0		370		401		452		457		1278		
Sum of minutes with flicker	500		0		700		1626		1543		1278						

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

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Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110WTG: 51 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (149)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	July		August		September		October		November		December	
1	05:44	19:45-20:28/43	06:09	19:22-19:44/22	06:42	18:42-19:07/25	07:14	06:50			07:27	15:26-15:52/26
	20:59		20:39	19:42-20:14/32	19:53	19:07-19:23/16	19:00	17:12			16:46	
2	05:44	19:45-20:28/43	06:10	19:21-19:47/26	06:43	18:42-19:08/26	07:15	06:51			07:28	15:26-15:52/26
	20:58		20:38	19:43-20:12/29	19:51	19:08-19:22/14	18:59	17:10			16:46	
3	05:45	19:45-20:28/43	06:11	19:19-19:50/31	06:44	18:42-19:09/27	07:16	06:53			07:29	15:26-15:53/27
	20:58		20:37	19:45-20:11/26	19:49	19:09-19:21/12	18:57	17:09			16:45	
4	05:45	19:46-20:29/43	06:12	19:18-19:51/33	06:45	18:40-19:10/30	07:17	06:54			07:30	15:26-15:53/27
	20:58		20:36	19:46-20:10/24	19:48	19:10-19:19/9	18:55	17:08			16:45	
5	05:46	19:46-20:28/42	06:13	19:17-19:52/35	06:46	18:39-19:10/31	07:18	06:55			07:31	15:27-15:54/27
	20:58		20:34	19:47-20:09/22	19:46	19:10-19:17/7	18:53	17:07			16:45	
6	05:47	19:46-20:28/42	06:14	19:02-19:15/13	06:47	18:38-19:10/32	07:19	06:56			07:32	15:27-15:54/27
	20:58		20:33	19:16-20:08/52	19:44	19:10-19:15/5	18:52	17:05			16:45	
7	05:47	19:46-20:28/42	06:15	18:59-19:19/20	06:48	18:37-19:10/33	07:20	06:58			07:33	15:27-15:54/27
	20:57		20:32	19:19-20:07/48	19:43	19:10-19:12/2	18:50	17:04			16:45	
8	05:48	19:46-20:28/42	06:16	18:56-19:21/25	06:49	18:28-18:42/14	07:22	06:59			07:34	15:28-15:55/27
	20:57		20:31	19:21-20:06/45	19:41	18:42-19:09/27	18:48	17:03			16:45	
9	05:49	19:47-20:28/41	06:17	18:54-19:22/28	06:50	18:24-18:45/21	07:23	07:00			07:34	15:28-15:55/27
	20:57		20:29	19:22-20:04/42	19:39	18:45-19:09/24	18:47	17:02			16:45	
10	05:49	19:46-20:27/41	06:18	18:53-19:24/31	06:51	18:22-18:46/24	07:24	07:01			07:35	15:29-15:56/27
	20:56		20:28	19:24-20:03/39	19:37	18:46-19:09/23	18:45	17:01			16:45	
11	05:50	19:46-20:28/42	06:19	18:51-19:25/34	06:52	18:20-18:47/27	07:25	07:03			07:36	15:28-15:55/27
	20:56		20:27	19:25-20:02/37	19:36	18:47-19:08/21	18:43	17:00			16:45	
12	05:51	19:47-20:28/41	06:20	18:50-19:26/36	06:53	18:18-18:48/30	07:26	07:04			07:37	15:29-15:56/27
	20:55		20:25	19:26-20:00/34	19:34	18:48-19:08/20	18:42	16:59			16:45	
13	05:52	19:47-20:27/40	06:22	18:49-19:27/38	06:54	18:17-18:49/32	07:27	07:05			07:38	15:30-15:57/27
	20:55		20:24	19:27-19:59/32	19:32	18:49-19:07/18	18:40	16:58			16:45	
14	05:52	19:47-20:26/39	06:23	18:47-19:27/40	06:55	18:16-18:49/33	07:28	07:06			07:39	15:30-15:57/27
	20:54		20:23	19:27-19:58/31	19:30	18:49-19:06/17	18:38	16:57			16:45	
15	05:53	19:47-20:26/39	06:24	18:46-19:28/42	06:57	18:14-18:49/35	07:30	07:08			07:39	15:31-15:58/27
	20:54		20:21	19:28-19:56/28	19:29	18:49-19:05/16	18:37	16:56			16:45	
16	05:54	19:47-20:26/39	06:25	18:46-19:30/44	06:58	18:13-18:50/37	07:31	07:09			07:40	15:31-15:58/27
	20:53		20:20	19:29-19:55/26	19:27	18:50-19:03/13	18:35	16:55			16:46	
17	05:55	19:45-20:26/41	06:26	18:45-19:31/46	06:59	18:13-18:49/36	07:32	07:10			07:41	15:32-15:58/26
	20:53	20:26-20:27/1	20:18	19:30-19:54/24	19:25	18:49-19:02/13	18:33	16:54			16:46	
18	05:56	19:44-20:26/42	06:27	18:45-19:30/45	07:00	18:12-18:49/37	07:33	07:11			07:41	15:33-15:59/26
	20:52		20:17	19:30-19:53/23	19:23	18:49-19:00/11	18:32	16:53			16:46	
19	05:57	19:42-20:24/42	06:28	18:44-19:30/46	07:01	18:12-18:49/37	07:34	07:13			07:42	15:32-15:59/27
	20:51	20:24-20:25/1	20:15	19:30-19:51/21	19:21	18:49-18:57/8	18:30	16:53			16:47	
20	05:57	19:41-20:24/43	06:29	18:43-19:30/47	07:02	18:11-18:48/37	07:35	07:14	15:33-15:38/5		07:43	15:33-16:00/27
	20:50		20:14	19:30-19:50/20	19:20	18:48-18:54/6	18:29	16:52			16:47	
21	05:58	19:40-20:24/44	06:30	18:43-19:30/47	07:03	18:11-18:47/36	07:37	07:15	15:30-15:41/11		07:43	15:33-16:00/27
	20:50	20:22-20:24/2	20:12	19:30-19:48/18	19:18		18:27	16:51			16:47	
22	05:59	19:40-20:23/43	06:31	18:42-19:30/48	07:04	18:11-18:46/35	07:38	07:16	15:29-15:43/14		07:44	15:34-16:01/27
	20:49	20:21-20:23/2	20:11	19:30-19:47/17	19:16		18:26	16:50			16:48	
23	06:00	19:39-20:22/43	06:32	18:42-19:30/48	07:05	18:11-18:45/34	07:39	07:17	15:28-15:44/16		07:44	15:34-16:01/27
	20:48	20:19-20:22/3	20:09	19:30-19:45/15	19:14		18:24	16:50			16:48	
24	06:01	19:38-20:19/41	06:33	18:41-19:30/49	07:06	18:11-18:44/33	07:40	07:19	15:27-15:45/18		07:45	15:35-16:02/27
	20:47	20:16-20:22/6	20:08	19:30-19:43/13	19:13		18:23	16:49			16:49	
25	06:02	19:38-20:21/43	06:34	18:41-19:30/49	07:07	18:11-18:43/32	07:41	07:20	15:27-15:47/20		07:45	15:35-16:02/27
	20:46		20:06	19:30-19:42/12	19:11		18:21	16:49			16:50	
26	06:03	19:37-20:20/43	06:35	18:41-19:29/48	07:08	18:13-18:42/29	07:43	07:21	15:26-15:48/22		07:46	15:36-16:02/26
	20:45		20:04	19:29-19:40/11	19:09		18:20	16:48			16:50	
27	06:04	19:37-20:19/42	06:36	18:41-19:29/48	07:09	18:14-18:40/26	07:44	07:22	15:26-15:49/23		07:46	15:36-16:03/27
	20:44		20:03	19:29-19:38/9	19:07		18:18	16:48			16:51	
28	06:05	19:37-20:18/41	06:37	18:41-19:28/47	07:10	18:15-18:38/23	07:45	07:23	15:25-15:49/24		07:46	15:37-16:04/27
	20:43		20:01	19:28-19:35/7	19:06		18:17	16:47			16:52	
29	06:06	19:36-20:17/41	06:39	18:41-19:27/46	07:12	18:17-18:36/19	07:46	07:24	15:25-15:50/25		07:46	15:37-16:04/27
	20:42		20:00	19:27-19:30/3	19:04		18:16	16:47			16:52	
30	06:07	19:29-19:38/9	06:40	18:41-19:02/21	07:13	18:20-18:32/12	07:48	07:25	15:25-15:50/25		07:47	15:37-16:05/28
	20:41	19:37-20:17/40	19:56	19:02-19:25/23	19:02		18:14	16:46			16:53	
31	06:08	19:24-19:41/17	06:41	18:41-19:05/24			07:49				07:47	15:38-16:05/27
	20:40	19:40-20:15/35	19:55	19:05-19:24/19			18:13				16:54	
Potential sun hours	464		431		375		343	294			283	
Sum of minutes with flicker	1316		1916		1165		0	203			833	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 11:06 AM / 37

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110WTG: 57 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (129)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

January			February			March			April			May			June		
1	07:47	14:25-14:56/31	07:32	15:37-16:17/40	06:54	16:34-17:00/26	07:01		06:14		05:43						
	16:55	15:04-15:38/34	17:31		18:06		19:43		20:15		20:46						
2	07:47	14:26-14:56/30	07:31	15:37-16:18/41	06:52	16:34-16:58/24	06:59		06:12		05:43						
	16:56	15:04-15:38/34	17:32		18:08		19:44		20:16		20:47						
3	07:47	14:27-14:56/29	07:30	15:37-16:18/41	06:51	16:36-16:57/21	06:58		06:11		05:42						
	16:57	15:05-15:39/34	17:33		18:09		19:45		20:17		20:48						
4	07:47	14:29-14:56/27	07:29	15:37-16:17/40	06:49	16:38-16:55/17	06:56		06:10		05:42						
	16:58	15:05-15:39/34	17:35		18:10		19:46		20:19		20:49						
5	07:47	14:30-14:56/26	07:28	15:38-16:17/39	06:48	16:40-16:51/11	06:54		06:08		05:42						
	16:59	15:06-15:39/33	17:36		18:11		19:47		20:20		20:50						
6	07:47	14:31-14:56/25	07:26	15:39-16:17/38	06:46		06:53		06:07		05:41						
	17:00	15:07-15:40/33	17:37		18:12		19:48		20:21		20:50						
7	07:47	14:33-14:56/23	07:25	15:39-16:16/37	06:44	17:18-17:29/11	06:51		06:06		05:41						
	17:01	15:08-15:40/32	17:38		18:14		19:49		20:22		20:51						
8	07:47	14:34-14:54/20	07:24	15:41-16:16/35	07:43	18:15-18:31/16	06:49		06:05		05:41						
	17:02	15:08-15:40/32	17:40		19:15		19:50		20:23		20:52						
9	07:46	14:36-14:54/18	07:23	15:41-16:15/34	07:41	18:12-18:32/20	06:48		06:03		05:40						
	17:03	15:09-15:40/31	17:41		19:16		19:52		20:24		20:52						
10	07:46	14:38-14:53/15	15:45-15:55/10	07:22	15:42-16:14/32	07:39	18:12-18:34/22	06:46	06:02		05:40						
	17:04	15:10-15:40/30	17:42		19:17		19:53		20:25		20:53						
11	07:46	14:41-14:50/9	15:43-15:57/14	07:20	15:44-16:13/29	07:38	18:10-18:34/24	06:44	06:01		05:40						
	17:05	15:10-15:40/30	17:44		19:18		19:54		20:26		20:53						
12	07:46	15:11-15:40/29	07:19	15:45-16:12/27	07:36	18:09-18:34/25	06:43	19:09-19:13/4	06:00		05:40						
	17:06	15:42-16:00/18	17:45		19:20		19:55		20:27		20:54						
13	07:45	15:13-15:40/27	07:18	15:47-16:10/23	07:34	18:09-18:35/26	06:41	19:04-19:16/12	05:59		05:40						
	17:07	15:42-16:02/20	17:46	16:42-16:53/11	19:21		19:56		20:28		20:54						
14	07:45	15:13-15:41/28	07:16	15:50-16:09/19	07:32	18:08-18:35/27	06:39	19:02-19:19/17	05:58		05:40						
	17:08	15:41-16:03/22	17:48	16:39-16:56/17	19:22		19:57		20:29		20:55						
15	07:45	15:15-15:41/26	07:15	15:52-16:05/13	07:31	18:08-18:35/27	06:38	19:00-19:20/20	05:57		05:40						
	17:09	15:41-16:05/24	17:49	16:37-16:58/21	19:23		19:58		20:30		20:55						
16	07:44	15:16-15:40/24	07:14	16:36-17:00/24	07:29	18:07-18:35/28	06:36	18:58-19:20/22	05:56		05:40						
	17:10	15:40-16:06/26	17:50		19:24	18:35-18:36/1	19:59		20:31		20:56						
17	07:44	15:17-15:39/22	07:12	16:34-17:00/26	07:27	18:07-18:35/28	06:34	18:58-19:21/23	05:55		05:40						
	17:12	15:39-16:06/27	17:51		19:25	18:35-18:37/2	20:01		20:33		20:56						
18	07:43	15:19-15:37/18	07:11	16:34-17:01/27	07:26	18:06-18:34/28	06:33	18:56-19:21/25	05:54		05:40						
	17:13	15:38-16:08/30	17:53		19:27	18:34-18:37/3	20:01		20:34		20:57						
19	07:42	15:20-15:36/16	07:09	16:32-17:02/30	07:24	18:05-18:33/28	06:31	18:56-19:22/26	05:53		05:40						
	17:14	15:37-16:09/32	17:54		19:28	18:33-18:37/4	20:02		20:35		20:57						
20	07:42	15:24-15:35/11	07:08	16:32-17:03/31	07:22	18:05-18:31/26	06:30	18:55-19:21/26	05:52		05:40						
	17:15	15:38-16:11/33	17:55		19:29	18:31-18:36/5	20:03		20:36		20:57						
21	07:41	15:37-16:11/34	07:06	16:31-17:02/31	07:20	18:05-18:31/26	06:28	18:56-19:22/26	05:51		05:40						
	17:17		17:56		19:30	18:31-18:37/6	20:04		20:37		20:58						
22	07:41	15:36-16:12/36	07:05	16:32-17:03/31	07:19	18:05-18:28/23	06:27	18:55-19:21/26	05:50		05:41						
	17:18		17:58		19:31	18:28-18:36/8	20:05		20:38		20:58						
23	07:40	15:36-16:13/37	07:03	16:31-17:03/32	07:17	18:05-18:25/20	06:25	18:55-19:21/26	05:49		05:41						
	17:19		17:59		19:32	18:25-18:35/10	20:06		20:38		20:58						
24	07:39	15:36-16:13/37	07:02	16:31-17:03/32	07:15	18:05-18:34/29	06:24	18:55-19:20/25	05:48		05:41						
	17:20		18:00		19:33		20:07		20:39		20:58						
25	07:38	15:36-16:15/39	07:00	16:31-17:02/31	07:13	18:06-18:34/28	06:22	18:56-19:20/24	05:48		05:41						
	17:22		18:01		19:35		20:08		20:40		20:58						
26	07:37	15:36-16:15/39	06:59	16:32-17:03/31	07:12	18:06-18:32/26	06:21	18:56-19:18/22	05:47		05:42						
	17:23		18:03		19:36		20:10		20:41		20:58						
27	07:37	15:36-16:16/40	06:57	16:32-17:02/30	07:10	18:07-18:31/24	06:19	18:57-19:17/20	05:46		05:42						
	17:24		18:04		19:37		20:11		20:42		20:58						
28	07:36	15:36-16:16/40	06:56	16:32-17:00/28	07:08	18:08-18:29/21	06:18	18:58-19:17/19	05:46		05:42						
	17:25		18:05		19:38		20:12		20:43		20:58						
29	07:35	15:36-16:17/41			07:06	18:10-18:27/17	06:16	18:59-19:14/15	05:45		05:43						
	17:27				19:39		20:13		20:44		20:58						
30	07:34	15:36-16:17/41			07:05	18:13-18:23/10	06:15	19:02-19:12/10	05:44		05:43						
	17:28				19:40		20:14		20:45		20:58						
31	07:33	15:36-16:17/41			07:03				05:44								
	17:29				19:41				20:46								
Potential sun hours	294		295		370		401		452		457						
Sum of minutes with flicker	1492		921		698		388		0		0						

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 11:06 AM / 38

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110**WTG:** 57 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (129)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	05:44 20:58	06:09 20:39	06:42 19:53	07:14 17:48-18:14/26 19:00	06:50 15:12-15:44/32 17:12	07:26 14:23-14:32/9 15:25-15:39/14 16:46 14:52-15:22/30
2	05:44 20:58	06:10 20:38	06:43 19:51	07:15 17:48-18:13/25 18:58	06:51 15:10-15:45/35 17:10	07:27 14:20-14:35/15 15:27-15:38/11 16:46 14:52-15:22/30
3	05:45 20:58	06:11 20:37	06:44 19:49	07:16 17:49-18:12/23 18:57	06:52 15:09-15:45/36 17:09	07:28 14:20-14:38/18 15:32-15:35/3 16:45 14:53-15:24/31
4	05:45 20:58	06:12 20:36	06:45 19:48	07:17 17:49-18:10/21 18:55	06:54 15:09-15:46/37 17:08	07:29 14:19-14:39/20 16:45 14:53-15:25/32
5	05:46 20:58	06:13 20:34	06:46 19:46	07:18 17:51-18:08/17 18:53	06:55 15:08-15:47/39 17:07	07:30 14:18-14:41/23 16:45 14:53-15:25/32
6	05:47 20:57	06:14 20:33	06:47 19:44	07:19 17:52-18:06/14 18:52	06:56 15:08-15:47/39 17:05	07:31 14:17-14:42/25 16:45 14:53-15:26/33
7	05:47 20:57	06:15 20:32	06:48 19:42	07:20 17:57-18:03/6 18:50	06:57 15:08-15:48/40 17:04	07:32 14:17-14:43/26 16:45 14:53-15:26/33
8	05:48 20:57	06:16 20:31	06:49 19:41	07:21 17:19-17:24/5 18:48	06:59 15:07-15:48/41 17:03	07:33 14:17-14:44/27 16:45 14:53-15:27/34
9	05:49 20:57	06:17 20:29	06:50 19:39	07:23 17:14-17:28/14 18:46	07:00 15:07-15:47/40 17:02	07:34 14:17-14:45/28 16:45 14:54-15:28/34
10	05:49 20:56	06:18 20:28	06:51 19:37	07:24 17:11-17:30/19 18:45	07:01 15:07-15:48/41 17:01	07:35 14:16-14:45/29 16:45 14:53-15:27/34
11	05:50 20:56	06:19 20:27	06:52 19:35	07:25 17:09-17:31/22 18:43	07:02 15:07-15:48/41 17:00	07:36 14:16-14:46/30 16:45 14:54-15:28/34
12	05:51 20:55	06:20 19:12-19:17/5 20:25	06:53 19:34	07:26 17:07-17:32/25 18:41	07:04 15:07-15:48/41 16:59	07:37 14:16-14:47/31 16:45 14:54-15:29/35
13	05:52 20:55	06:22 19:09-19:21/12 20:24	06:54 18:05-18:14/9 19:32	07:27 17:07-17:34/27 18:40	07:05 15:08-15:48/40 16:58	07:38 14:16-14:48/32 16:45 14:55-15:29/34
14	05:52 20:54	06:23 19:06-19:22/16 20:22	06:55 18:01-18:17/16 19:30	07:28 17:05-17:34/29 18:38	07:06 15:08-15:48/40 16:57	07:38 14:16-14:49/33 16:45 14:55-15:30/35
15	05:53 20:54	06:24 19:05-19:24/19 20:21	06:56 17:58-18:19/21 19:28	07:29 17:04-17:34/30 18:37	07:07 15:08-15:48/40 16:56	07:39 14:16-14:49/33 16:45 14:55-15:30/35
16	05:54 20:53	06:25 19:04-19:24/20 20:20	06:58 17:56-18:20/24 19:27	07:31 17:03-17:34/31 18:35	07:09 15:09-15:48/39 16:55	07:40 14:16-14:50/34 16:46 14:56-15:31/35
17	05:55 20:52	06:26 19:02-19:25/23 20:18	06:59 17:55-18:20/25 19:25	07:32 17:03-17:34/31 18:33	07:10 15:09-15:48/39 16:54	07:41 14:17-14:51/34 16:46 14:56-15:31/35
18	05:56 20:52	06:27 19:02-19:25/23 20:17	07:00 17:53-18:21/28 19:23	07:33 17:03-17:35/32 18:32	07:11 15:10-15:47/37 16:53	07:41 14:17-14:51/34 16:46 14:56-15:31/35
19	05:57 20:51	06:28 19:01-19:26/25 20:15	07:01 17:52-18:21/29 19:21	07:34 17:02-17:34/32 18:30	07:12 15:11-15:48/37 16:53	07:42 14:17-14:52/35 16:47 14:57-15:32/35
20	05:57 20:50	06:29 19:01-19:27/26 20:14	07:02 17:51-18:10/19 19:20	07:35 17:02-17:34/32 18:29	07:14 15:11-15:47/36 16:52	07:43 14:18-14:53/35 16:47 14:58-15:33/35
21	05:58 20:49	06:30 19:01-19:27/26 20:12	07:03 17:50-18:13/23 19:18	07:36 17:02-17:33/31 18:27	07:15 15:12-15:46/34 16:51	07:43 14:18-14:53/35 16:47 14:58-15:33/35
22	05:59 20:49	06:31 19:00-19:26/26 20:11	07:04 17:50-18:14/24 19:16	07:38 17:03-17:33/30 18:26	07:16 15:00-15:11/11 16:50	07:44 14:19-14:54/35 16:48 14:59-15:34/35
23	06:00 20:48	06:32 19:00-19:26/26 20:09	07:05 17:49-18:15/26 19:14	07:39 17:03-17:32/29 18:24	07:17 14:57-15:13/16 16:50	07:44 14:19-14:54/35 16:48 14:59-15:34/35
24	06:01 20:47	06:33 19:00-19:26/26 20:07	07:06 17:49-18:16/27 19:12	07:40 17:04-17:31/27 18:23	07:18 14:56-15:14/18 16:49	07:45 14:19-14:54/35 16:49 14:59-15:34/35
25	06:02 20:46	06:34 19:00-19:25/25 20:06	07:07 17:48-18:16/28 19:11	07:41 17:05-17:30/25 18:21	07:20 14:55-15:17/22 16:49	07:45 14:21-14:55/34 16:50 15:00-15:35/35
26	06:03 20:45	06:35 19:00-19:24/24 20:04	07:08 17:48-18:17/29 19:09	07:43 17:06-17:29/23 18:20	07:21 14:55-15:19/24 16:48	07:45 14:21-14:55/34 16:50 15:00-15:35/35
27	06:04 20:44	06:36 19:01-19:23/22 20:03	07:09 17:50-18:18/28 19:07	07:44 16:21-16:35/14 18:18	07:22 14:54-15:20/26 16:48	07:46 14:21-14:55/34 16:51 15:01-15:35/34
28	06:05 20:43	06:37 19:02-19:21/19 20:01	07:10 17:49-18:17/28 19:05	07:45 16:18-16:38/20 18:17	07:23 14:53-15:21/28 16:47	07:46 14:23-14:56/33 16:52 15:02-15:37/35
29	06:06 20:42	06:39 19:03-19:20/17 19:58	07:11 17:49-18:16/27 19:04	07:46 16:16-16:40/24 18:16	07:24 14:53-15:20/27 16:47	07:46 14:23-14:56/33 16:52 15:02-15:37/35
30	06:07 20:41	06:40 19:05-19:17/12 19:56	07:13 17:48-18:15/27 19:02	07:47 16:14-16:42/28 18:14	07:25 14:52-15:21/29 16:46	07:46 14:24-14:56/32 16:53 15:03-15:37/34
31	06:08 20:40	06:41 19:09-19:12/3 19:54		07:49 16:12-16:42/30 18:13		07:47 14:24-14:56/32 16:54 15:03-15:37/34
Potential sun hours	463	431	375	343	294	283
Sum of minutes with flicker	0	395	478	788	1239	2004

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

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Licensed user:

EDR

217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110WTG: 66 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (120)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

January			February			March			April			May			June		
1	07:47	08:27-09:06/39	15:33-16:05/32	07:32	08:04-08:31/27	06:54	07:39-08:22/43	07:01	08:12-08:40/28	06:14					05:43	06:13-06:36/23	
	16:55	09:06-09:16/10		17:31		18:06		19:43		20:15					20:47		
2	07:47	08:28-09:06/38	15:34-16:06/32	07:31	08:04-08:31/27	06:52	07:30-07:40/10	07:00	08:14-08:37/23	06:12					05:43	06:11-06:37/26	
	16:56	09:06-09:16/10		17:32		18:08	07:40-08:21/41	19:44		20:16					20:47		
3	07:47	08:28-09:07/39	15:35-16:06/31	07:30	08:05-08:31/26	06:51	07:25-07:46/21	06:58	08:17-08:33/16	06:11					05:42	06:11-06:38/27	
	16:57	09:07-09:16/9		17:33		18:09	07:46-08:21/35	19:45		20:17					20:48		
4	07:47	08:28-09:08/40	15:36-16:07/31	07:29	08:05-08:31/26	06:49	07:22-07:49/27	06:56		06:10					05:42	06:10-06:39/29	
	16:58	09:08-09:16/8		17:35		18:10	07:49-08:19/30	19:46		20:19					20:49		
5	07:47	08:29-09:08/39	15:38-16:07/29	07:28	08:05-08:30/25	06:48	07:19-07:50/31	06:54		06:08					05:42	06:09-06:40/31	
	16:59	09:08-09:16/8		17:36		18:11	07:50-08:18/28	19:47		20:20					20:50		
6	07:47	08:30-09:09/39	15:39-16:08/29	07:26	08:06-08:30/24	06:46	07:17-07:53/36	06:53		06:07					05:41	06:09-06:41/32	
	17:00	09:09-09:16/7		17:37		18:13	07:53-08:17/24	19:48		20:21					20:50		
7	07:47	08:30-09:09/39	15:40-16:09/29	07:25	08:07-08:30/23	06:44	07:15-07:54/39	06:51		06:06					05:41	06:09-06:42/33	
	17:01	09:09-09:16/7		17:38		18:14	07:54-08:15/21	19:49		20:22					20:51		
8	07:47	08:30-09:09/39	15:39-16:08/29	07:24	08:08-08:29/21	07:43	08:13-08:55/42	06:49		06:05					05:41	06:08-06:42/34	
	17:02	09:09-09:15/6		17:40		19:15	08:55-09:13/18	19:50		20:23					20:52		
9	07:47	08:31-09:09/38	15:40-16:09/29	07:23	08:09-08:27/18	07:41	08:12-08:56/44	06:48		06:03					05:41	06:08-06:43/35	
	17:03	09:09-09:15/6		17:41		19:16	08:56-09:11/15	19:52		20:24					20:52		
10	07:46	08:31-09:10/39	15:41-16:10/29	07:22	08:00-08:04/4	07:39	08:11-08:57/46	06:46		06:02					05:40	06:08-06:44/36	
	17:04	09:10-09:14/4		17:42	08:11-08:26/15	19:17	08:57-09:08/11	19:53		20:25					20:53		
11	07:46	08:31-09:10/39	15:41-16:09/28	07:20	07:55-08:10/15	07:38	08:09-08:57/48	06:44		06:01					05:40	06:08-06:44/36	
	17:05	09:10-09:12/2		17:44	08:13-08:23/10	19:18	08:57-09:03/6	19:54		20:26					20:53		
12	07:46	08:32-09:10/38		07:19	07:51-08:12/21	07:36	08:08-08:56/48	06:43		06:00					05:40	06:08-06:45/37	
	17:06	15:42-16:10/28		17:45		19:20		19:55		20:27					20:54		
13	07:45	08:33-09:10/37		07:18	07:49-08:15/26	07:34	08:08-08:57/49	06:41		05:59					05:40	06:08-06:45/37	
	17:07	15:43-16:10/27		17:46		19:21		19:56		20:28					20:55		
14	07:45	08:33-09:10/37		07:16	07:48-08:17/29	07:32	08:07-08:57/50	06:39		05:58					05:40	06:08-06:46/38	
	17:08	15:43-16:10/27		17:48		19:22		19:57		20:29					20:55		
15	07:45	08:34-09:10/36		07:15	07:46-08:18/32	07:31	08:06-08:57/51	06:38		05:57					05:40	06:08-06:46/38	
	17:09	15:44-16:11/27		17:49		19:23		19:58		20:30					20:55		
16	07:44	08:34-09:10/36		07:14	07:45-08:20/35	07:29	08:06-08:58/52	06:36		05:56					05:40	06:08-06:47/39	
	17:10	15:44-16:10/26		17:50		19:24		19:59		20:32					20:56		
17	07:44	08:36-09:10/34		07:12	07:43-08:20/37	07:27	08:05-08:57/52	06:35		05:55					05:40	06:08-06:47/39	
	17:12	15:45-16:10/25		17:51		19:25		20:01		20:33					20:56		
18	07:43	08:36-09:10/34		07:11	07:43-08:21/38	07:26	08:05-08:57/52	06:33		05:54					05:40	06:08-06:47/39	
	17:13	15:46-16:10/24		17:53		19:27		20:01		20:34					20:57		
19	07:43	08:36-09:09/33		07:09	07:43-08:22/39	07:24	08:04-08:56/52	06:31		05:53					05:40	06:08-06:47/39	
	17:14	15:47-16:09/22		17:54		19:28		20:02		20:35					20:57		
20	07:42	08:10-08:20/10	15:49-16:09/20	07:08	07:41-08:23/42	07:22	08:05-08:56/51	06:30		05:52					05:40	06:08-06:47/39	
	17:15	08:38-09:10/32		17:55		19:29		20:03		20:36					20:57		
21	07:41	08:08-08:22/14	15:50-16:08/18	07:06	07:41-08:23/42	07:20	08:04-08:55/51	06:28		05:51					05:40	06:08-06:47/39	
	17:17	08:39-09:09/30		17:57		19:30		20:04		20:37					20:58		
22	07:41	08:07-08:23/16	15:51-16:07/16	07:05	07:40-08:23/43	07:19	08:04-08:54/50	06:27		05:50					05:41	06:09-06:48/39	
	17:18	08:39-09:08/29		17:58		19:31		20:05		20:38					20:58		
23	07:40	08:06-08:24/18	15:53-16:06/13	07:03	07:39-08:23/44	07:17	08:04-08:53/49	06:25		05:49					05:41	06:09-06:48/39	
	17:19	08:40-09:07/27		17:59		19:32		20:06		20:39					20:58		
24	07:39	08:06-08:26/20	15:56-16:03/7	07:02	07:40-08:24/44	07:15	08:05-08:53/48	06:24		05:49					05:41	06:09-06:48/39	
	17:20	08:42-09:07/25		18:00		19:33		20:07		20:39					20:58		
25	07:38	08:05-08:27/22		07:00	07:39-08:23/44	07:13	08:05-08:52/47	06:22		05:48					05:41	06:10-06:49/39	
	17:22	08:44-09:06/22		18:02		19:35		20:08		20:40					20:58		
26	07:38	08:05-08:28/23		06:59	07:39-08:23/44	07:12	08:05-08:50/45	06:21		05:47					05:42	06:10-06:49/39	
	17:23	08:45-09:05/20		18:03		19:36		20:10		20:41					20:58		
27	07:37	08:04-08:29/25		06:57	07:39-08:23/44	07:10	08:06-08:49/43	06:19		05:46					05:42	06:10-06:48/38	
	17:24	08:48-09:03/15		18:04		19:37		20:11		20:42					20:58		
28	07:36	08:04-08:29/25		06:56	07:40-08:23/43	07:08	08:07-08:48/41	06:18		05:46	06:21-06:27/6				05:42	06:11-06:49/38	
	17:25	08:51-08:59/8		18:05		19:38		20:12		20:43					20:59		
29	07:35	08:04-08:30/26				07:06	08:08-08:46/38	06:16		05:45	06:17-06:30/13				05:43	06:11-06:49/38	
	17:27					19:39		20:13		20:44					20:59		
30	07:34	08:04-08:30/26				07:05	08:08-08:44/36	06:15		05:44	06:15-06:33/18				05:43	06:12-06:49/37	
	17:28					19:40		20:14		20:45					20:58		
31	07:33	08:04-08:31/27				07:03	08:10-08:42/32			05:44	06:13-06:34/21						
	17:29					19:41				20:46							
Potential sun hours			294				401				452				457		
Sum of minutes with flicker			1858				1553				58				1072		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

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Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110WTG: 66 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (120)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	July		August		September		October		November		December	
1	05:44	06:12-06:48/36	06:09	06:42			07:14	07:47-08:36/49	06:50	07:40-07:56/16	07:26	08:13-08:52/39 15:23-15:51/28
	20:58		20:39	19:53			19:00		17:12		16:46	08:52-08:54/2
2	05:44	06:13-06:49/36	06:10	06:43			07:15	07:48-08:36/48	06:51	07:38-07:57/19	07:27	08:14-08:53/39 15:23-15:52/29
	20:58		20:38	19:51			18:58	08:36-08:39/3	17:10		16:46	08:53-08:57/4
3	05:45	06:13-06:48/35	06:11	06:44			07:16	07:48-08:35/47	06:52	07:37-07:58/21	07:28	08:15-08:53/38 15:24-15:53/29
	20:58		20:37	19:49			18:57	08:35-08:44/9	17:09		16:45	08:53-08:59/6
4	05:45	06:14-06:48/34	06:12	06:45			07:17	07:49-08:33/44	06:54	07:36-07:59/23	07:30	08:15-08:54/39 15:25-15:53/28
	20:58		20:36	19:48			18:55	08:33-08:47/14	17:08		16:45	08:54-09:00/6
5	05:46	06:14-06:47/33	06:13	06:46			07:18	07:49-08:32/43	06:55	07:35-08:00/25	07:31	08:15-08:54/39 15:25-15:54/29
	20:58		20:34	19:46			18:53	08:32-08:49/17	17:07		16:45	08:54-09:01/7
6	05:47	06:15-06:48/33	06:14	06:47			07:19	07:51-08:31/40	06:56	07:35-08:00/25	07:32	08:16-08:55/39 15:25-15:54/29
	20:58		20:33	19:44			18:52	08:31-08:51/20	17:05		16:45	08:55-09:02/7
7	05:47	06:15-06:46/31	06:15	06:48			07:20	07:52-08:29/37	06:57	07:35-08:01/26	07:32	08:16-08:55/39 15:25-15:55/30
	20:57		20:32	19:42			18:50	08:29-08:52/23	17:04		16:45	08:55-09:03/8
8	05:48	06:16-06:46/30	06:16	06:49			07:21	07:53-08:27/34	06:59	07:34-08:01/27	07:33	08:16-08:56/40 15:25-15:55/30
	20:57		20:31	19:41			18:48	08:27-08:53/26	17:03		16:45	08:56-09:04/8
9	05:49	06:18-06:46/28	06:17	06:50	08:11-08:26/15		07:23	07:55-08:25/30	07:00	07:35-08:02/27	07:34	08:17-08:56/39 15:24-15:55/31
	20:57		20:29	19:39			18:47	08:25-08:53/28	17:02		16:45	08:56-09:05/9
10	05:49	06:18-06:45/27	06:18	06:51	08:07-08:30/23		07:24	07:57-08:22/25	07:01	07:35-08:02/27	07:35	08:17-08:56/39 15:23-15:55/32
	20:56		20:28	19:37			18:45	08:22-08:54/32	17:01		16:45	08:56-09:05/9
11	05:50	06:20-06:44/24	06:19	06:52	08:04-08:32/28		07:25	08:00-08:17/17	07:02	07:35-08:02/27	07:36	08:17-08:56/39 15:23-15:55/32
	20:56		20:27	19:35			18:43	08:17-08:54/37	17:00		16:45	08:56-09:06/10
12	05:51	06:21-06:43/22	06:21	06:53	08:02-08:34/32		07:26	08:14-08:55/41	07:04	07:36-08:02/26	07:37	08:18-08:57/39 15:24-15:56/32
	20:55		20:25	19:34			18:42		16:59		16:45	08:57-09:07/10
13	05:52	06:23-06:42/19	06:22	06:54	08:00-08:35/35		07:27	08:13-08:55/42	07:05	07:36-08:02/26	07:38	08:19-08:57/38 15:24-15:57/33
	20:55		20:24	19:32			18:40		16:58		16:45	08:57-09:08/11
14	05:52	06:24-06:40/16	06:23	06:55	07:58-08:36/38		07:28	08:12-08:55/43	07:06	07:36-08:01/25	07:39	08:19-08:58/39 15:24-15:57/33
	20:54		20:22	19:30			18:38		16:57	08:23-08:31/8	16:45	08:58-09:09/11
15	05:53	06:27-06:38/11	06:24	06:57	07:56-08:37/41		07:29	08:11-08:55/44	07:07	07:37-08:02/25	07:39	08:19-08:58/39 15:24-15:57/33
	20:54		20:21	19:28			18:37		16:56	08:21-08:36/15	16:45	08:58-09:09/11
16	05:54		06:25	06:58	07:55-08:38/43		07:31	08:11-08:55/44	07:09	07:38-08:01/23	07:40	08:20-08:58/38 15:24-15:58/34
	20:53		20:20	19:27			18:35		16:55	08:18-08:38/20	16:46	08:58-09:10/12
17	05:55		06:26	06:59	07:54-08:38/44		07:32	08:11-08:55/44	07:10	07:38-08:00/22	07:41	08:21-08:59/38 15:25-15:58/33
	20:52		20:18	19:25			18:33		16:54	08:17-08:39/22	16:46	08:59-09:11/12
18	05:56		06:27	07:00	07:53-08:39/46		07:33	08:11-08:55/44	07:11	07:40-08:00/20 15:30-15:37/7	07:41	08:20-08:59/39 15:25-15:58/33
	20:52		20:17	19:23			18:32		16:53	08:15-08:40/25	16:46	08:59-09:11/12
19	05:57		06:28	07:01	07:51-08:39/48		07:34	08:11-08:54/43	07:12	07:41-07:59/18 15:28-15:41/13	07:42	08:21-09:00/39 15:25-15:59/34
	20:51		20:15	19:21			18:30		16:53	08:15-08:42/27	16:47	09:00-09:13/13
20	05:57		06:29	07:02	07:51-08:40/49		07:35	08:11-08:54/43	07:14	07:42-07:58/16 15:26-15:42/16	07:43	08:22-09:01/39 15:26-16:00/34
	20:50		20:14	19:20			18:29		16:52	08:14-08:43/29	16:47	09:01-09:14/13
21	05:58		06:30	07:03	07:50-08:40/50		07:37	08:12-08:54/42	07:15	07:43-07:57/14 15:25-15:43/18	07:43	08:22-09:01/39 15:26-16:00/34
	20:49		20:12	19:18			18:27		16:51	08:14-08:44/30	16:47	09:01-09:14/13
22	05:59		06:31	07:04	07:49-08:40/51		07:38	08:12-08:53/41	07:16	07:46-07:56/10 15:25-15:45/20	07:44	08:23-09:02/39 15:27-16:01/34
	20:49		20:11	19:16			18:26		16:50	08:14-08:46/32	16:48	09:02-09:15/13
23	06:00		06:32	07:05	07:48-08:40/52		07:39	08:12-08:52/40	07:17	08:13-08:46/33	07:44	08:23-09:02/39 15:27-16:01/34
	20:48		20:09	19:14			18:24		16:50	15:24-15:46/22	16:48	09:02-09:15/13
24	06:01		06:33	07:06	07:48-08:39/51		07:40	08:13-08:51/38	07:18	08:13-08:47/34	07:45	08:23-09:02/39 15:27-16:01/34
	20:47		20:07	19:12			18:23		16:49	15:24-15:47/23	16:49	09:02-09:15/13
25	06:02		06:34	07:07	07:47-08:39/52		07:41	08:14-08:50/36	07:20	08:13-08:47/34	07:45	08:24-09:03/39 15:29-16:02/33
	20:46		20:06	19:11			18:21		16:49	15:23-15:48/25	16:50	09:03-09:15/12
26	06:03		06:35	07:08	07:48-08:40/52		07:43	08:15-08:49/34	07:21	08:13-08:49/36	07:45	08:25-09:03/38 15:29-16:02/33
	20:45		20:04	19:09			18:20		16:48	15:24-15:49/25	16:50	09:03-09:15/12
27	06:04		06:36	07:09	07:48-08:39/51		07:44	08:16-08:47/31	07:22	08:13-08:49/36	07:46	08:25-09:03/38 15:29-16:02/33
	20:44		20:03	19:07			18:18		16:48	15:23-15:50/27	16:51	09:03-09:15/12
28	06:05		06:37	07:10	07:47-08:38/51		07:45	08:18-08:46/28	07:23	08:13-08:50/37	07:46	08:26-09:04/38 15:31-16:04/33
	20:43		20:01	19:05			18:17		16:47	15:23-15:50/27	16:52	09:04-09:16/12
29	06:06		06:39	07:12	07:47-08:38/51		07:46	08:19-08:44/25	07:24	08:13-08:50/37	07:46	08:26-09:05/39 15:31-16:04/33
	20:42		19:58	19:04			18:16		16:47	15:23-15:50/27	16:52	09:05-09:16/11
30	06:07		06:40	07:13	07:47-08:37/50		07:47	08:21-08:42/21	07:25	08:13-08:51/38	07:46	08:26-09:05/39 15:32-16:04/32
	20:41		19:56	19:02			18:14		16:46	15:23-15:51/28	16:53	09:05-09:16/11
31	06:08		06:41				07:49	08:24-08:38/14			07:47	08:27-09:05/38 15:32-16:05/33
	20:40		19:54				18:13	08:42-08:53/11			16:54	09:05-09:16/11
Potential sun hours	463		431	375			343		294		283	
Sum of minutes with flicker	415		0	953			1372		1259		2508	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

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Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110WTG: 69 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (151)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117		541	386	285 8,759

Idle start wind speed: Cut in wind speed from power curve

	January		February		March		April		May		June		July		August		September		October		November		December	
1	07:47	15:45-15:59/14	07:32	08:25-08:46/21	06:54	07:01	06:14	05:43	05:44	06:09	06:42	07:14							06:50	07:48-08:23/35	07:27			
	16:55		17:31	08:46-08:52/6	18:07	19:43	20:15	20:47	20:59	20:39	19:53	19:00							17:12		16:46			
2	07:47	15:46-15:58/12	07:31	08:24-08:48/24	06:53	07:00	06:12	05:43	05:44	06:10	06:43	07:15							06:51	07:48-08:22/34	07:28			
	16:56		17:32	08:48-08:51/3	18:08	19:44	20:17	20:48	20:59	20:38	19:51	18:59							17:10		16:46			
3	07:47	15:47-15:58/11	07:30	08:23-08:49/26	06:51	06:58	06:11	05:42	05:45	06:11	06:44	07:16							06:53	07:49-08:22/33	07:29			
	16:57		17:33	08:49-08:51/2	18:09	19:45	20:18	20:48	20:58	20:37	19:50	18:57							17:09		16:45			
4	07:47	15:48-15:58/10	07:29	08:22-08:50/28	06:49	06:56	06:10	05:42	05:45	06:12	06:45	07:17							06:54	07:49-08:21/32	07:30			
	16:58		17:35	08:50-08:51/1	18:10	19:46	20:19	20:49	20:58	20:36	19:48	18:55							17:08		16:45			
5	07:47	15:51-15:57/6	07:28	08:21-08:51/30	06:48	06:54	06:08	05:42	05:46	06:13	06:46	07:18							06:55	07:50-08:20/30	07:31			
	16:59		17:36		18:11	19:47	20:20	20:50	20:58	20:35	19:46	18:53							17:07		16:45			
6	07:47		07:27	08:20-08:51/31	06:46	06:53	06:07	05:41	05:47	06:14	06:47	07:19							06:56	07:51-08:20/29	07:32			
	17:00		17:37		18:13	19:48	20:21	20:51	20:58	20:33	19:44	18:52							17:06		16:45			
7	07:47		07:25	08:19-08:52/33	06:44	06:51	06:06	05:41	05:47	06:15	06:48	07:20							06:58	07:52-08:20/28	07:33	15:38-15:43/5		
	17:01		17:39		18:14	19:49	20:22	20:51	20:57	20:32	19:43	18:50							17:04		16:45			
8	07:47		07:24	08:19-08:53/34	07:43	06:49	06:05	05:41	05:48	06:16	06:49	07:22							06:59	07:53-08:19/26	07:34	15:37-15:45/8		
	17:02		17:40		19:15	19:51	20:23	20:52	20:57	20:31	19:41	18:48							17:03	08:19-08:21/2	16:45			
9	07:47		07:23	08:19-08:53/34	07:41	06:48	06:03	05:41	05:49	06:17	06:50	07:23							07:00	07:55-08:18/23	07:35	15:36-15:47/11		
	17:03		17:41		19:16	19:52	20:24	20:52	20:57	20:29	19:39	18:47							17:02	08:18-08:22/4	16:45			
10	07:47		07:22	08:18-08:53/35	07:39	06:46	06:02	05:40	05:49	06:18	06:51	07:24							07:01	07:56-08:16/20	07:35	15:36-15:48/12		
	17:04		17:42		19:17	19:53	20:25	20:53	20:56	20:28	19:37	18:45							17:01	08:16-08:23/7	16:45			
11	07:46		07:21	08:18-08:53/35	07:38	06:44	06:01	05:40	05:50	06:19	06:52	07:25							07:03	07:58-08:14/16	07:36	15:36-15:50/14		
	17:05		17:44		19:19	19:54	20:26	20:54	20:56	20:27	19:36	18:43							17:00	08:14-08:23/9	16:45			
12	07:46		07:19	08:19-08:54/35	07:36	06:43	06:00	05:40	05:51	06:21	06:53	07:26							07:04	07:59-08:12/13	07:37	15:35-15:50/15		
	17:06		17:45		19:20	19:55	20:28	20:54	20:55	20:25	19:34	18:42							16:59	08:12-08:24/12	16:45			
13	07:46		07:18	08:18-08:53/35	07:34	06:41	05:59	05:40	05:52	06:22	06:54	07:27							07:05	07:59-08:24/25	07:38	15:35-15:51/16		
	17:07		17:46		19:21	19:56	20:29	20:55	20:55	20:24	19:32	18:40							16:58		16:45			
14	07:45		07:17	08:18-08:53/35	07:33	06:39	05:58	05:40	05:52	06:23	06:56	07:28							07:06	07:59-08:23/24	07:39	15:35-15:52/17		
	17:08		17:48		19:22	19:57	20:30	20:55	20:54	20:23	19:30	18:38							16:57		16:45			
15	07:45		07:15	08:18-08:52/34	07:31	06:38	05:57	05:40	05:53	06:24	06:57	07:30							07:08	08:00-08:24/24	07:39	15:36-15:53/17		
	17:09		17:49		19:23	19:59	20:31	20:56	20:54	20:21	19:29	18:37							16:56		16:45			
16	07:44		07:14	08:19-08:52/33	07:29	06:36	05:56	05:40	05:54	06:25	06:58	07:31							07:09	08:00-08:24/24	07:40	15:35-15:53/18		
	17:11		17:50		19:24	20:00	20:32	20:56	20:53	20:20	19:27	18:35							16:55		16:46			
17	07:44	08:33-08:40/7	07:12	08:20-08:52/32	07:27	06:35	05:55	05:40	05:55	06:26	06:59	07:32							07:10	08:00-08:23/23	07:41	15:36-15:54/18		
	17:12		17:52		19:26	20:00	20:33	20:57	20:53	20:18	19:25	18:34							16:54		16:46			
18	07:43	08:31-08:42/11	07:11	08:20-08:51/31	07:26	06:33	05:54	05:40	05:56	06:27	07:00	07:33	09:00-09:12/12						07:11	08:02-08:24/22	07:42	15:36-15:55/19		
	17:13		17:53		19:27	20:01	20:34	20:57	20:52	20:17	19:23	18:32							16:53		16:46			
19	07:43	08:30-08:45/15	07:10	08:21-08:50/29	07:24	06:31	05:53	05:40	05:57	06:28	07:01	07:34	08:56-09:15/19						07:13	08:02-08:23/21	07:42	15:36-15:55/19		
	17:14		17:54		19:28	20:02	20:35	20:57	20:51	20:15	19:21	18:30							16:53		16:47			
20	07:42	08:29-08:46/17	07:08	08:21-08:49/28	07:22	06:30	05:52	05:40	05:57	06:29	07:02	07:35	08:54-09:17/23						07:14	08:03-08:23/20	07:43	15:37-15:56/19		
	17:15		17:55		19:29	20:03	20:36	20:58	20:50	20:14	19:20	18:29							16:52		16:47			
21	07:41	08:28-08:47/19	07:07	08:23-08:48/25	07:20	06:28	05:51	05:40	05:58	06:30	07:03	07:37	08:53-09:19/26						07:15	08:04-08:23/19	07:43	15:37-15:56/19		
	17:17		17:57		19:30	20:04	20:37	20:58	20:50	20:12	19:18	18:27							16:51		16:47			
22	07:41	08:28-08:48/20	07:05	08:24-08:45/21	07:19	06:27	05:50	05:41	05:59	06:31	07:04	07:38	08:52-09:20/28						07:16	08:05-08:22/17	07:44	15:38-15:57/19		
	17:18		17:58		19:31	20:05	20:38	20:58	20:49	20:11	19:16	18:26							16:51		16:48			
23	07:40	08:28-08:49/21	07:04	08:27-08:44/17	07:17	06:25	05:49	05:41	06:00	06:32	07:05	07:39	08:50-09:20/30						07:17	08:06-08:21/15	07:44	15:38-15:57/19		
	17:19		17:59		19:32	20:06	20:39	20:58	20:48	20:09	19:14	18:24							16:50		16:48			
24	07:39	08:28-08:50/22	07:02	08:29-08:39/10	07:15	06:24	05:49	05:41	06:01	06:33	07:06	07:40	08:50-09:22/32						07:19	08:08-08:19/11	07:45	15:39-15:58/19		
	17:20		18:00		19:34	20:08	20:40	20:58	20:47	20:08	19:13	18:23							16:49		16:49			
25	07:39	08:27-08:50/23	07:01		07:13	06:22	05:48	05:41	06:02	06:34	07:07	07:41	08:49-09:22/33						07:20	08:11-08:18/7	07:45	15:39-15:58/19		
	17:22		18:02		19:35	20:09	20:41	20:59	20:46	20:06	19:11	18:21							16:49		16:50			
26	07:38	08:27-08:51/24	06:59		07:12	06:21	05:47	05:42	06:03	06:35	07:08	07:43	08:48-09:22/34						07:21		07:46	15:40-15:58/18		
	17:23		18:03		19:36	20:10	20:42	20:59	20:45	20:04	19:09	18:20							16:48		16:50			
27	07:37	08:27-08:51/24	06:57		07:10	06:19	05:46	05:42	06:04	06:36	07:09	07:44	08:48-09:22/34						07:22		07:46	15:41-15:59/18		
	17:24		18:04		19:37	20:11	20:42	20:59	20:44	20:03	19:07	18:18							16:48		16:51			
28	07:36	08:27-08:52/25	06:56		07:08	06:18	05:46	05:42	06:05	06:38	07:11	07:45	08:48-09:23/35						07:23		07:46	15:41-15:59/18		
	17:25		18:05		19:38	20:12	20:43	20:59	20:43	20:01	19:06	18:17							16:47		16:52			
29	07:35	08:27-08:52/25			07:07	06:16	05:45	05:43	06:06	06:39	07:12	07:46	08:48-09:23/35						07:24		07:46	15:42-15:59/17		
	17:27				19:39	20:13	20:44	20:59	20:42	20:00	19:04	18:16							16:47		16:52			
30	07:34	08:27-08:40/13			07:05	06:15	05:45	05:43	06:07	06:40	07:13	07:48	08:47-09:23/3											

Project:

2015-08-31_Arkwright Summit_SFA

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(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110WTG: 93 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (117)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
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1	07:47	07:32	06:54	07:01	06:14	05:43	05:44	06:09	06:42	07:14	06:50	07:26
	16:55	17:31	18:06	19:42	20:15	20:46	20:58	20:39	19:53	19:00	17:12	16:46
2	07:47	07:31	06:52	06:59	06:12	05:43	05:44	06:10	06:43	07:15	06:51	07:27
	16:56	17:32	18:08	19:44	20:16	20:47	20:58	20:38	19:51	18:58	17:10	16:46
3	07:47	07:30	06:51	06:58	06:11	05:42	05:45	06:11	06:44	07:16	06:52	07:28
	16:57	17:33	18:09	19:45	20:17	20:48	20:58	20:37	19:49	18:57	17:09	16:45
4	07:47	07:29	06:49	06:56	06:10	05:42	05:45	06:12	06:45	07:17	06:54	07:29
	16:58	17:35	18:10	19:46	20:18	20:49	20:58	20:35	19:48	18:55	17:08	16:45
5	07:47	07:28	06:48	06:54	06:08	05:42	05:46	06:13	06:46	07:18	06:55	07:30
	16:59	17:36	18:11	19:47	20:20	20:49	20:58	20:34	19:46	18:53	17:07	16:45
6	07:47	07:26	06:46	06:53	06:07	05:41	05:47	06:14	06:47	07:19	06:56	07:31
	17:00	17:37	18:12	19:48	20:21	20:50	20:57	20:33	19:44	18:52	17:05	16:45
7	07:47	07:25	06:44	06:51	06:06	05:41	05:47	06:15	06:48	07:20	06:57	07:32
	17:01	17:38	18:14	19:49	20:22	20:51	20:57	20:32	19:42	18:50	17:04	16:45
8	07:47	07:24	07:43	06:49	06:05	05:41	05:48	06:16	06:49	07:21	06:59	07:33
	17:02	17:40	19:15	19:50	20:23	20:52	20:57	20:31	19:41	18:48	17:03	16:45
9	07:46	07:23	07:41	06:48	06:03	05:41	05:49	06:17	06:50	07:23	07:00	07:34
	17:03	17:41	19:16	19:52	20:24	20:52	20:56	20:29	19:39	18:46	17:02	16:45
10	07:46	07:22	07:39	06:46	06:02	05:40	05:49	06:18	06:51	07:24	07:01	07:35
	17:04	17:42	19:17	19:53	20:25	20:53	20:56	20:28	19:37	18:45	17:01	16:45
11	07:46	07:20	07:38	06:44	06:01	05:40	05:50	06:19	06:52	07:25	07:02	07:36
	17:05	17:44	19:18	19:54	20:26	20:53	20:56	20:27	19:35	18:43	17:00	16:45
12	07:46	07:19	07:36	06:43	06:00	05:40	05:51	06:20	06:53	07:26	07:04	07:37
	17:06	17:45	19:20	19:55	20:27	20:54	20:55	20:25	19:34	18:41	16:59	16:45
13	07:45	07:18	07:34	06:41	05:59	05:40	05:52	06:22	06:54	07:27	07:05	07:38
	17:07	17:46	19:21	19:56	20:28	20:54	20:55	20:24	19:32	18:40	16:58	16:45
14	07:45	07:16	07:32	06:39	05:58	05:40	05:52	06:23	06:55	07:28	07:06	07:38
	17:08	17:48	19:22	19:57	20:29	20:55	20:54	20:22	19:30	18:38	16:57	16:45
15	07:44	07:15	07:31	06:38	05:57	05:40	05:53	06:24	06:56	07:29	07:07	07:39
	17:09	17:49	19:23	19:58	20:30	20:55	20:54	20:21	19:28	18:37	16:56	16:45
16	07:44	07:14	07:29	06:36	05:56	05:40	05:54	06:25	06:58	07:31	07:09	07:40
	17:10	17:50	19:24	19:59	20:31	20:56	20:53	20:20	19:27	18:35	16:55	16:46
17	07:44	07:12	07:27	06:34	05:55	05:40	05:55	06:26	06:59	07:32	07:10	07:41
	17:12	17:51	19:25	20:01	20:32	20:56	20:52	20:18	19:25	18:33	16:54	16:46
18	07:43	07:11	07:26	06:33	05:54	05:40	05:56	06:27	07:00	07:33	07:11	07:41
	17:13	17:53	19:27	20:01	20:33	20:57	20:52	20:17	19:23	18:32	16:53	16:46
19	07:42	07:09	07:24	06:31	05:53	05:40	05:57	06:28	07:01	07:34	07:12	07:42
	17:14	17:54	19:28	20:02	20:34	20:57	20:51	20:15	19:21	18:30	16:53	16:47
20	07:42	07:08	07:22	06:30	05:52	05:40	05:57	06:29	07:02	07:35	07:14	07:42
	17:15	17:55	19:29	20:03	20:35	20:57	20:50	20:14	19:20	18:29	16:52	16:47
21	07:41	07:06	07:20	06:28	05:51	05:40	05:58	06:30	07:03	07:36	07:15	07:43
	17:17	17:56	19:30	20:04	20:36	20:57	20:49	20:12	19:18	18:27	16:51	16:47
22	07:40	07:05	07:19	06:27	05:50	05:41	05:59	06:31	07:04	07:38	07:16	07:44
	17:18	17:58	19:31	20:05	20:37	20:58	20:49	20:11	19:16	18:26	16:50	16:48
23	07:40	07:03	07:17	06:25	05:49	05:41	06:00	06:32	07:05	07:39	07:17	07:44
	17:19	17:59	19:32	20:06	20:38	20:58	20:48	20:09	19:14	18:24	16:50	16:48
24	07:39	07:02	07:15	06:24	05:48	05:41	06:01	06:33	07:06	07:40	07:18	07:44
	17:20	18:00	19:33	20:07	20:39	20:58	20:47	20:07	19:12	18:23	16:49	16:49
25	07:38	07:00	07:13	06:22	05:48	05:41	06:02	06:34	07:07	07:41	07:19	07:45
	17:22	18:01	19:35	20:08	20:40	20:58	20:46	20:06	19:11	18:21	16:49	16:50
26	07:37	06:59	07:12	06:21	05:47	05:42	06:03	06:35	07:08	07:42	07:21	07:45
	17:23	18:03	19:36	20:10	20:41	20:58	20:45	20:04	19:09	18:20	16:48	16:50
27	07:37	06:57	07:10	06:19	05:46	05:42	06:04	06:36	07:09	07:44	07:22	07:46
	17:24	18:04	19:37	20:11	20:42	20:58	20:44	20:03	19:07	18:18	16:48	16:51
28	07:36	06:56	07:08	06:18	05:46	05:42	06:05	06:37	07:10	07:45	07:23	07:46
	17:25	18:05	19:38	20:12	20:43	20:58	20:43	20:01	19:05	18:17	16:47	16:52
29	07:35		07:06	06:16	05:45	05:43	06:06	06:38	07:11	07:46	07:24	07:46
	17:27		19:39	20:13	20:44	20:58	20:42	19:58	19:04	18:16	16:47	16:52
30	07:34		07:05	06:15	05:44	05:43	06:07	06:40	07:13	07:47	07:25	07:46
	17:28		19:40	20:14	20:45	20:58	20:41	19:56	19:02	18:14	16:46	16:53
31	07:33		07:03		05:44		06:08	06:41		07:49		07:47
	17:29		19:41		20:46		20:40	19:54		18:13		16:54
Potential sun hours	294	295	370	401	452	457	463	431	375	343	294	283
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

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Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110WTG: 95 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (119)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

[January	[February	[March	[April	[May	[June	[July	[August	[September	[October	[November	[December
----------	-----------	--------	--------	------	-------	-------	---------	------------	----------	-----------	-----------

1	07:47	07:32	06:54	07:01	06:14	05:43	05:44	06:09	06:42	07:14	17:40-18:08/28	06:50	07:26
	16:55	17:31	18:06	19:42	20:15	20:46	20:58	20:39	19:53	19:00		17:12	16:46
2	07:47	07:31	06:52	06:59	06:12	05:43	05:44	06:10	06:43	07:15	17:39-18:07/28	06:51	07:27
	16:56	17:32	18:08	19:44	20:16	20:47	20:58	20:38	19:51	18:58		17:10	16:46
3	07:47	07:30	06:51	06:58	06:11	05:42	05:45	06:11	06:44	07:16	17:39-18:06/27	06:52	07:28
	16:57	17:33	18:09	19:45	20:17	20:48	20:58	20:37	19:49	18:57		17:09	16:45
4	07:47	07:29	06:49	06:56	06:10	05:42	05:45	06:12	06:45	07:17	17:39-18:05/26	06:54	07:29
	16:58	17:34	18:10	19:46	20:18	20:49	20:58	20:35	19:48	18:55		17:08	16:45
5	07:47	07:27	06:47	06:54	06:08	05:42	05:46	06:13	06:46	07:18	17:40-18:04/24	06:55	07:30
	16:59	17:36	18:11	19:47	20:20	20:49	20:58	20:34	19:46	18:53		17:07	16:45
6	07:47	07:26	06:46	06:53	06:07	05:41	05:47	06:14	06:47	07:19	17:40-18:02/22	06:56	07:31
	17:00	17:37	18:12	19:48	20:21	20:50	20:57	20:33	19:44	18:51		17:05	16:45
7	07:47	07:25	06:44	06:51	06:06	05:41	05:47	06:15	06:48	07:20	17:43-18:02/19	06:57	07:32
	17:01	17:38	18:14	19:49	20:22	20:51	20:57	20:32	19:42	18:50		17:04	16:45
8	07:47	07:24	07:43	06:49	06:04	05:41	05:48	06:16	06:49	07:21	17:44-17:59/15	06:59	07:33
	17:02	17:40	19:15	19:50	20:23	20:51	20:57	20:30	19:41	18:48		17:03	16:45
9	07:46	07:23	07:41	06:48	06:03	05:40	05:49	06:17	06:50	07:22	17:47-17:55/8	07:00	07:34
	17:03	17:41	19:16	19:51	20:24	20:52	20:56	20:29	19:39	18:46		17:02	16:45
10	07:46	07:22	07:39	06:46	06:02	05:40	05:49	06:18	06:51	07:24		07:01	07:35
	17:04	17:42	19:17	19:53	20:25	20:53	20:56	20:28	19:37	18:45		17:01	16:45
11	07:46	07:20	07:37	06:44	06:01	05:40	05:50	06:19	06:52	07:25		07:02	07:36
	17:05	17:44	19:18	19:54	20:26	20:53	20:56	20:26	19:35	18:43		17:00	16:45
12	07:46	07:19	07:36	06:43	06:00	05:40	05:51	06:20	06:53	07:26		07:04	07:37
	17:06	17:45	19:20	19:55	20:27	20:54	20:55	20:25	19:34	18:41		16:59	16:45
13	07:45	07:18	07:34	06:41	05:59	05:40	05:52	06:21	06:54	07:27	18:12-18:21/9	07:05	07:38
	17:07	17:46	19:21	19:56	20:28	20:54	20:55	20:24	19:32	18:40		16:58	16:45
14	07:45	07:16	07:32	06:39	05:58	05:40	05:52	06:23	06:55	07:28	18:09-18:23/14	07:06	07:38
	17:08	17:48	19:22	19:57	20:29	20:55	20:54	20:22	19:30	18:38		16:57	16:45
15	07:44	07:15	07:31	06:38	05:57	05:40	05:53	06:24	06:56	07:29	18:06-18:25/19	07:07	07:39
	17:09	17:49	19:23	19:58	20:30	20:55	20:53	20:21	19:28	18:37		16:56	16:45
16	07:44	07:14	07:29	06:36	05:56	05:40	05:54	06:25	06:57	07:30	18:04-18:26/22	07:09	07:40
	17:10	17:50	19:24	19:59	20:31	20:56	20:53	20:19	19:27	18:35		16:55	16:45
17	07:43	07:12	07:27	06:34	05:55	05:40	05:55	06:26	06:59	07:32	18:03-18:26/23	07:10	07:41
	17:12	17:51	19:25	20:00	20:32	20:56	20:52	20:18	19:25	18:33		16:54	16:46
18	07:43	07:11	07:25	06:33	05:54	05:40	05:56	06:27	07:00	07:33	18:02-18:27/25	07:11	07:41
	17:13	17:53	19:27	20:00	20:33	20:56	20:52	20:17	19:23	18:32		16:53	16:46
19	07:42	07:09	07:24	06:31	05:53	05:40	05:57	06:28	07:01	07:34	18:01-18:27/26	07:12	07:42
	17:14	17:54	19:28	20:02	20:34	20:57	20:51	20:15	19:21	18:30		16:53	16:46
20	07:42	07:08	07:22	06:30	05:52	05:40	05:57	06:29	07:02	07:35	18:00-18:27/27	07:13	07:42
	17:15	17:55	19:29	20:03	20:35	20:57	20:50	20:14	19:19	18:29		16:52	16:47
21	07:41	07:06	07:20	06:28	05:51	05:40	05:58	06:30	07:03	07:36	17:59-18:27/28	07:15	07:43
	17:16	17:56	19:30	20:04	20:36	20:57	20:49	20:12	19:18	18:27		16:51	16:47
22	07:40	07:05	07:18	06:27	05:50	05:40	05:59	06:31	07:04	07:38	17:51-18:04/13	07:16	07:43
	17:18	17:58	19:31	20:05	20:37	20:58	20:49	20:10	19:16	18:26	18:04-18:26/22	16:50	16:48
23	07:40	07:03	07:17	06:25	05:49	05:41	06:00	06:32	07:05	07:39	17:48-18:06/18	07:17	07:44
	17:19	17:59	19:32	20:06	20:38	20:58	20:48	20:09	19:14	18:24	18:06-18:25/19	16:50	16:48
24	07:39	07:02	07:15	06:24	05:48	05:41	06:01	06:33	07:06	07:40	17:46-18:07/21	07:18	07:44
	17:20	18:00	19:33	20:07	20:39	20:58	20:47	20:07	19:12	18:23	18:07-18:25/18	16:49	16:49
25	07:38	07:00	07:13	06:22	05:48	05:41	06:02	06:34	07:07	07:41	17:44-18:08/24	07:19	07:45
	17:21	18:01	19:35	20:08	20:40	20:58	20:46	20:06	19:11	18:21	18:08-18:24/16	16:49	16:50
26	07:37	06:59	07:12	06:21	05:47	05:42	06:03	06:35	07:08	07:42	17:43-18:09/26	07:21	07:45
	17:23	18:03	19:36	20:09	20:41	20:58	20:45	20:04	19:09	18:20	18:09-18:22/13	16:48	16:50
27	07:37	06:57	07:10	06:19	05:46	05:42	06:04	06:36	07:09	07:44	17:41-18:09/28	07:22	07:46
	17:24	18:04	19:37	20:11	20:42	20:58	20:44	20:03	19:07	18:18	18:09-18:21/12	16:48	16:51
28	07:36	06:56	07:08	06:18	05:46	05:42	06:05	06:37	07:10	07:45	17:40-18:09/29	07:23	07:46
	17:25	18:05	19:38	20:12	20:43	20:58	20:43	20:01	19:05	18:17	18:09-18:19/10	16:47	16:52
29	07:35		07:06	06:16	05:45	05:43	06:06	06:38	07:11	07:46	17:41-18:10/29	07:24	07:46
	17:27		19:39	20:13	20:44	20:58	20:42	19:58	19:04	18:16	18:10-18:17/7	16:47	16:52
30	07:34		07:05	06:15	05:44	05:43	06:07	06:40	07:12	07:47	17:40-18:09/29	07:25	07:46
	17:28		19:40	20:14	20:45	20:58	20:41	19:56	19:02	18:14	18:09-18:13/4	16:46	16:53
31	07:33		07:03		05:44		06:08	06:41		07:49			07:46
	17:29		19:41		20:46		20:40	19:54		18:13			16:54
Potential sun hours	294	295	370	401	452	457	463	431	375	343		294	283
Sum of minutes with flicker	0	0	718	0	0	0	0	0	531	197		0	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

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Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110WTG: 96 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (123)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

January		February		March		April		May		June	
1	07:47 16:55	07:32 17:31	15:59-16:24/25	06:54 18:06	16:19-16:51/32	07:01 19:42		06:14 20:15	19:04-19:26/22	05:43 20:46	
2	07:47 16:56	07:31 17:32	15:58-16:26/28	06:52 18:08	16:19-16:50/31	06:59 19:44		06:12 20:16	19:02-19:26/24	05:43 20:47	
3	07:47 16:57	07:30 17:33	15:56-16:26/30	06:51 18:09	16:20-16:48/28	06:58 19:45		06:11 20:17	19:01-19:27/26	05:42 20:48	
4	07:47 16:58	07:29 17:34	15:56-16:27/31	06:49 18:10	16:21-16:48/27	06:56 19:46		06:10 20:18	19:01-19:28/27	05:42 20:49	
5	07:47 16:59	07:27 17:36	15:55-16:28/33	06:47 18:11	16:23-16:46/23	06:54 19:47		06:08 20:20	19:00-19:28/28	05:42 20:49	
6	07:47 16:59	07:26 17:37	15:55-16:29/34	06:46 18:12	16:24-16:43/19	06:53 19:48		06:07 20:21	18:59-19:28/29	05:41 20:50	
7	07:47 17:00	07:25 17:38	15:55-16:30/35	06:44 18:14	16:28-16:41/13	06:51 19:49		06:06 20:22	18:59-19:29/30	05:41 20:51	
8	07:47 17:02	07:24 17:40	15:54-16:30/36	07:42 19:15		06:49 19:50		06:04 20:23	18:59-19:29/30	05:41 20:51	
9	07:46 17:03	07:23 17:41	15:54-16:30/36	07:41 19:16		06:48 19:51		06:03 20:24	18:59-19:29/30	05:40 20:52	
10	07:46 17:04	07:21 17:42	15:54-16:31/37	07:39 19:17		06:46 19:53		06:02 20:25	18:59-19:29/30	05:40 20:53	
11	07:46 17:05	07:20 17:44	15:55-16:31/36	07:37 19:18		06:44 19:54		06:01 20:26	18:59-19:29/30	05:40 20:53	
12	07:46 17:06	07:19 17:45	15:54-16:31/37	07:36 19:20		06:43 19:55		06:00 20:27	19:00-19:29/29	05:40 20:54	
13	07:45 17:07	07:18 17:46	15:55-16:32/37	07:34 19:21		06:41 19:56		05:59 20:28	19:00-19:29/29	05:40 20:54	
14	07:45 17:08	07:16 17:47	15:54-16:31/37	07:32 19:22		06:39 19:57		05:58 20:29	18:59-19:28/29	05:40 20:55	
15	07:44 17:09	07:15 17:49	15:55-16:31/36	07:31 19:23		06:38 19:58		05:57 20:30	19:01-19:28/27	05:40 20:55	
16	07:44 17:10	07:14 17:50	15:56-16:31/35	07:29 19:24		06:36 19:59		05:56 20:31	19:01-19:28/27	05:40 20:56	
17	07:43 17:12	07:12 17:51	15:56-16:30/34	07:27 19:25		06:34 20:00		05:55 20:32	19:01-19:27/26	05:40 20:56	
18	07:43 17:13	07:11 17:53	15:57-16:30/33	07:25 19:26		06:33 20:00		05:54 20:33	19:02-19:26/24	05:40 20:56	
19	07:42 17:14	07:09 17:54	15:58-16:28/30	07:24 19:28		06:31 20:02		05:53 20:34	19:03-19:26/23	05:40 20:57	
20	07:42 17:15	07:08 17:55	16:00-16:27/27	07:22 19:29		06:30 20:03		05:52 20:35	19:03-19:25/22	05:40 20:57	
21	07:41 17:16	07:06 17:56	16:01-16:25/24	07:20 19:30		06:28 20:04		05:51 20:36	19:04-19:24/20	05:40 20:57	
22	07:40 17:18	07:05 17:58	16:03-16:24/21	07:18 19:31		06:27 20:05		05:50 20:37	19:05-19:23/18	05:40 20:58	
23	07:40 17:19	07:03 17:59	16:06-16:21/15	07:17 19:32		06:25 20:06		05:49 20:38	19:07-19:22/15	05:41 20:58	
24	07:39 17:20	07:02 18:00	16:17-16:53/36	07:15 19:33		06:24 20:07		05:48 20:39	19:08-19:21/13	05:41 20:58	
25	07:38 17:21	07:00 18:01	16:17-16:53/36	07:13 19:34		06:22 20:08		05:48 20:40	19:10-19:18/8	05:41 20:58	
26	07:37 17:23	06:59 18:03	16:18-16:53/35	07:12 19:36		06:21 20:09		05:47 20:41		05:42 20:58	
27	07:36 17:24	06:57 18:04	16:18-16:52/34	07:10 19:37		06:19 20:11		05:46 20:42		05:42 20:58	
28	07:36 17:25	16:06-16:15/9	06:56 18:05	16:17-16:51/34	07:08 19:38	06:18 20:12	19:10-19:20/10	05:46 20:43		05:42 20:58	
29	07:35 17:27	16:03-16:19/16			07:06 19:39	06:16 20:13	19:07-19:22/15	05:45 20:44		05:43 20:58	
30	07:34 17:28	16:01-16:21/20			07:05 19:40	06:15 20:14	19:05-19:24/19	05:44 20:45		05:43 20:58	
31	07:33 17:29	16:00-16:23/23			07:03 19:41			05:44 20:46			
Potential sun hours		294	295	370	401	452	616	457	0		
Sum of minutes with flicker		68	1145	173	44						

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

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Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110**WTG:** 96 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (123)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

July		August		September		October		November		December	
1	05:44	06:09	19:09-19:39/30	06:42	07:14			06:50	15:24-16:01/37	07:26	
	20:58	20:39		19:53	19:00			17:12		16:46	
2	05:44	06:10	19:09-19:39/30	06:43	07:15			06:51	15:24-16:00/36	07:27	
	20:58	20:38		19:51	18:58			17:10		16:46	
3	05:45	06:11	19:09-19:39/30	06:44	07:16			06:52	15:24-15:59/35	07:28	
	20:58	20:37		19:49	18:57			17:09		16:45	
4	05:45	06:12	19:09-19:39/30	06:45	07:17			06:54	15:25-16:00/35	07:29	
	20:58	20:35		19:47	18:55			17:08		16:45	
5	05:46	06:13	19:09-19:38/29	06:46	07:18			06:55	15:25-15:59/34	07:30	
	20:58	20:34		19:46	18:53			17:07		16:45	
6	05:47	06:14	19:09-19:38/29	06:47	07:19	17:06-17:14/8		06:56	15:25-15:58/33	07:31	
	20:57	20:33		19:44	18:51			17:05		16:45	
7	05:47	06:15	19:09-19:38/29	06:48	07:20	17:02-17:18/16		06:57	15:27-15:58/31	07:32	
	20:57	20:32		19:42	18:50			17:04		16:45	
8	05:48	06:16	19:09-19:37/28	06:49	07:21	16:59-17:20/21		06:59	15:27-15:57/30	07:33	
	20:57	20:30		19:41	18:48			17:03		16:45	
9	05:49	06:17	19:10-19:36/26	06:50	07:22	16:57-17:22/25		07:00	15:28-15:56/28	07:34	
	20:56	20:29		19:39	18:46			17:02		16:45	
10	05:49	06:18	19:10-19:36/26	06:51	07:24	16:55-17:22/27		07:01	15:30-15:55/25	07:35	
	20:56	20:28		19:37	18:45			17:01		16:45	
11	05:50	06:19	19:11-19:34/23	06:52	07:25	16:53-17:23/30		07:02	15:31-15:54/23	07:36	
	20:56	20:26		19:35	18:43			17:00		16:45	
12	05:51	06:20	19:12-19:33/21	06:53	07:26	16:52-17:24/32		07:04	15:32-15:52/20	07:37	
	20:55	20:25		19:34	18:41			16:59		16:45	
13	05:52	06:21	19:13-19:32/19	06:54	07:27	16:52-17:25/33		07:05	15:35-15:51/16	07:38	
	20:55	20:24		19:32	18:40			16:58		16:45	
14	05:52	06:23	19:15-19:29/14	06:55	07:28	16:51-17:25/34		07:06	15:38-15:47/9	07:38	
	20:54	20:22		19:30	18:38			16:57		16:45	
15	05:53	06:24	19:18-19:26/8	06:56	07:29	16:50-17:25/35		07:07		07:39	
	20:53	20:21		19:28	18:37			16:56		16:45	
16	05:54	06:25		06:57	07:30	16:49-17:25/36		07:09		07:40	
	20:53	20:19		19:27	18:35			16:55		16:45	
17	05:55	06:26		06:58	07:32	16:48-17:24/36		07:10		07:40	
	20:52	20:18		19:25	18:33			16:54		16:46	
18	05:56	19:22-19:27/5	06:27	07:00	07:33	16:40-16:50/10		07:11		07:41	
	20:52	20:17		19:23	18:32	16:50-17:25/35		16:53		16:46	
19	05:57	19:19-19:29/10	06:28	07:01	07:34	16:36-16:53/17		07:12		07:42	
	20:51	20:15		19:21	18:30	16:53-17:24/31		16:53		16:46	
20	05:57	19:17-19:31/14	06:29	07:02	07:35	16:33-16:55/22		07:13		07:42	
	20:50	20:14		19:19	18:29	16:55-17:23/28		16:52		16:47	
21	05:58	19:16-19:32/16	06:30	07:03	07:36	16:31-16:56/25		07:15		07:43	
	20:49	20:12		19:18	18:27	16:56-17:23/27		16:51		16:47	
22	05:59	19:15-19:34/19	06:31	07:04	07:38	16:30-16:58/28		07:16		07:43	
	20:49	20:10		19:16	18:26	16:58-17:23/25		16:50		16:48	
23	06:00	19:14-19:35/21	06:32	07:05	07:39	16:28-16:59/31		07:17		07:44	
	20:48	20:09		19:14	18:24	16:59-17:22/23		16:50		16:48	
24	06:01	19:14-19:36/22	06:33	07:06	07:40	16:27-17:00/33		07:18		07:44	
	20:47	20:07		19:12	18:23	17:00-17:20/20		16:49		16:49	
25	06:02	19:13-19:37/24	06:34	07:07	07:41	16:26-17:00/34		07:19		07:45	
	20:46	20:06		19:11	18:21	17:00-17:19/19		16:49		16:50	
26	06:03	19:12-19:37/25	06:35	07:08	07:42	16:26-17:01/35		07:21		07:45	
	20:45	20:04		19:09	18:20	17:01-17:18/17		16:48		16:50	
27	06:04	19:12-19:38/26	06:36	07:09	07:44	16:25-17:01/36		07:22		07:46	
	20:44	20:03		19:07	18:18	17:01-17:16/15		16:48		16:51	
28	06:05	19:10-19:37/27	06:37	07:10	07:45	16:24-17:01/37		07:23		07:46	
	20:43	20:01		19:05	18:17	17:01-17:14/13		16:47		16:52	
29	06:06	19:10-19:38/28	06:38	07:11	07:46	16:24-17:02/38		07:24		07:46	
	20:42	19:58		19:04	18:16	17:02-17:12/10		16:47		16:52	
30	06:07	19:10-19:38/28	06:39	07:12	07:47	16:24-17:00/36		07:25		07:46	
	20:41	19:56		19:02	18:14	17:03-17:07/4		16:46		16:53	
31	06:08	19:09-19:39/30	06:41		07:49	16:23-17:00/37				07:46	
	20:40	19:54			18:13					16:54	
Potential sun hours	463	431		375	343			294		283	
Sum of minutes with flicker	295	372		0	1019			392		0	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 11:06 AM / 46

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110WTG: 97 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (118)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	January		February		March		April		May		June	
1	07:47	14:10-14:44/34	07:32	15:03-15:12/9	06:54	07:01			06:14	18:19-19:11/52	05:43	
	16:55	14:44-15:18/34	17:31		18:06	19:42			20:15		20:46	
2	07:47	14:11-14:44/33	07:31		06:52	06:59			06:12	18:19-19:08/49	05:43	
	16:56	14:44-15:19/35	17:32		18:08	19:44			20:16		20:47	
3	07:47	14:12-14:44/32	07:30		06:51	06:58			06:11	18:19-19:02/43	05:42	
	16:57	14:44-15:19/35	17:33		18:09	19:45			20:17		20:48	
4	07:47	14:13-14:44/31	07:29		06:49	06:56			06:09	18:19-19:02/43	05:42	
	16:58	14:44-15:20/36	17:34		18:10	19:46			20:18		20:49	
5	07:47	14:14-14:44/30	07:27		06:47	06:54			06:08	18:18-19:01/43	05:42	
	16:59	14:44-15:20/36	17:36		18:11	19:47			20:19		20:49	
6	07:47	14:15-14:44/29	07:26		06:46	06:53			06:07	18:19-19:01/42	05:41	
	16:59	14:44-15:21/37	17:37		18:12	19:48			20:21		20:50	
7	07:47	14:16-14:43/27	07:25		06:44	06:51			06:06	18:19-19:01/42	05:41	
	17:00	14:43-15:20/37	17:38		18:14	19:49			20:22		20:51	
8	07:47	14:17-14:42/25	07:24		07:42	06:49			06:04	18:20-19:01/41	05:41	
	17:02	14:42-15:21/39	17:40		19:15	19:50			20:23		20:51	
9	07:46	14:19-14:42/23	07:23		07:41	06:47			06:03	18:20-19:00/40	05:40	
	17:03	14:42-15:22/40	17:41		19:16	19:51			20:24		20:52	
10	07:46	14:21-14:42/21	07:21		07:39	06:46			06:02	18:21-19:00/39	05:40	
	17:04	14:42-15:22/40	17:42		19:17	19:53			20:25		20:53	
11	07:46	14:22-14:40/18	07:20		07:37	06:44			06:01	18:22-19:00/38	05:40	
	17:05	14:40-15:22/42	17:44		19:18	19:54			20:26		20:53	
12	07:46	14:25-14:39/14	07:19		07:36	06:43	19:06-19:10/4		06:00	18:22-18:59/37	05:40	
	17:06	14:39-15:23/44	17:45		19:20	19:55			20:27		20:54	
13	07:45	14:29-14:33/4	07:18		07:34	06:41	19:01-19:13/12		05:59	18:23-18:58/35	05:40	
	17:07	14:37-15:23/46	17:46		19:21	19:56			20:28		20:54	
14	07:45	14:38-15:23/45	07:16		07:32	06:39	19:00-19:16/16		05:58	18:23-18:57/34	05:40	
	17:08		17:47		19:22	19:57			20:29		20:55	
15	07:44	14:38-15:23/45	07:15		07:31	06:38	18:58-19:16/18		05:57	18:25-18:57/32	05:40	
	17:09		17:49		19:23	19:58			20:30		20:55	
16	07:44	14:39-15:24/45	07:14		07:29	06:36	18:56-19:17/21		05:56	18:26-18:56/30	05:40	
	17:10		17:50		19:24	19:59			20:31		20:56	
17	07:43	14:39-15:23/44	07:12		07:27	06:34	18:35-18:50/15		05:55	18:27-18:55/28	05:40	
	17:12		17:51		19:25	20:00	18:55-19:18/23		20:32		20:56	
18	07:43	14:41-15:24/43	07:11		07:25	06:33	18:32-18:53/21		05:54	18:28-18:54/26	05:40	
	17:13		17:53		19:26	20:00	18:54-19:18/24		20:33		20:56	
19	07:42	14:41-15:24/43	07:09		07:24	06:31	18:30-19:18/48		05:53	18:29-18:53/24	05:40	
	17:14		17:54		19:28	20:02			20:34		20:57	
20	07:42	14:41-15:23/42	07:08		07:22	06:30	18:27-19:18/51		05:52	18:30-18:51/21	05:40	
	17:15		17:55		19:29	20:03			20:35		20:57	
21	07:41	14:43-15:24/41	07:06		07:20	06:28	18:26-19:18/52		05:51	18:32-18:49/17	05:40	
	17:16		17:56		19:30	20:04			20:36		20:57	
22	07:40	14:44-15:24/40	07:05		07:18	06:27	18:24-19:18/54		05:50	18:34-18:47/13	05:40	
	17:18		17:58		19:31	20:05			20:37		20:58	
23	07:40	14:44-15:23/39	07:03		07:17	06:25	18:24-19:18/54		05:49	18:37-18:45/8	05:41	
	17:19		17:59		19:32	20:06			20:38		20:58	
24	07:39	14:45-15:23/38	07:02		07:15	06:24	18:22-19:17/55		05:48		05:41	
	17:20		18:00		19:33	20:07			20:39		20:58	
25	07:38	14:46-15:22/36	07:00		07:13	06:22	18:22-19:16/54		05:48		05:41	
	17:21		18:01		19:34	20:08	19:16-19:17/1		20:40		20:58	
26	07:37	14:49-15:22/33	06:59		07:12	06:21	18:20-19:14/54		05:47		05:42	
	17:23		18:03		19:36	20:09	19:14-19:16/2		20:41		20:58	
27	07:36	14:50-15:21/31	06:57		07:10	06:19	18:20-19:13/53		05:46		05:42	
	17:24		18:04		19:37	20:11	19:13-19:16/3		20:42		20:58	
28	07:36	14:51-15:20/29	06:56		07:08	06:18	18:20-19:12/52		05:46		05:42	
	17:25		18:05		19:38	20:12	19:12-19:15/3		20:43		20:58	
29	07:35	14:53-15:19/26			07:06	06:16	18:19-19:08/49		05:45		05:43	
	17:27				19:39	20:13	19:08-19:14/6		20:44		20:58	
30	07:34	14:56-15:18/22			07:05	06:15	18:19-19:13/54		05:44		05:43	
	17:28				19:40	20:14			20:45		20:58	
31	07:33	14:58-15:15/17			07:03				05:44			
	17:29				19:41				20:45			
Potential sun hours	294		295		370		401		452		457	
Sum of minutes with flicker	1481		9		0		799		777		0	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 11:06 AM / 47

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(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110**WTG:** 97 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (118)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

July		August		September		October	November		December	
1	05:44	06:09	18:32-19:09/37	06:42	07:14	06:50			07:26	14:05-14:22/17
	20:58	20:39		19:53	19:00	17:12			16:46	14:22-15:04/42
2	05:44	06:10	18:31-19:09/38	06:43	07:15	06:51			07:27	14:03-14:24/21
	20:58	20:38		19:51	18:58	17:10			16:46	14:24-15:05/41
3	05:45	06:11	18:30-19:10/40	06:44	07:16	06:52			07:28	14:02-14:25/23
	20:58	20:37		19:49	18:57	17:09			16:45	14:25-15:05/40
4	05:45	06:12	18:30-19:10/40	06:45	07:17	06:54			07:29	14:01-14:26/25
	20:58	20:35		19:47	18:55	17:08			16:45	14:26-15:05/39
5	05:46	06:13	18:29-19:10/41	06:46	07:18	06:55			07:30	14:01-14:28/27
	20:58	20:34		19:46	18:53	17:07			16:45	14:28-15:05/37
6	05:47	06:14	18:29-19:11/42	06:47	07:19	06:56			07:31	14:00-14:29/29
	20:57	20:33		19:44	18:51	17:05			16:45	14:29-15:06/37
7	05:47	06:15	18:28-19:11/43	06:48	07:20	06:57			07:32	14:00-14:30/30
	20:57	20:32		19:42	18:50	17:04			16:45	14:30-15:06/36
8	05:48	06:16	18:28-19:11/43	06:49	07:21	06:59			07:33	14:00-14:31/31
	20:57	20:30		19:41	18:48	17:03			16:45	14:31-15:07/36
9	05:49	06:17	18:28-19:11/43	06:50	07:22	07:00			07:34	14:00-14:32/32
	20:56	20:29		19:39	18:46	17:02			16:45	14:32-15:07/35
10	05:49	06:18	18:27-19:14/47	06:51	07:24	07:01	14:33-14:43/10		07:35	14:00-14:33/33
	20:56	20:28		19:37	18:45	17:01			16:45	14:33-15:08/35
11	05:50	06:19	18:27-19:18/51	06:52	07:25	07:02	14:29-14:46/17		07:36	14:00-14:34/34
	20:56	20:26		19:35	18:43	17:00			16:45	14:34-15:08/34
12	05:51	06:20	18:27-19:20/53	06:53	07:26	07:04	14:26-14:49/23		07:37	14:00-14:34/34
	20:55	20:25		19:34	18:41	16:59			16:45	14:34-15:09/35
13	05:52	06:21	18:27-19:21/54	06:54	07:27	07:05	14:25-14:51/26		07:38	14:01-14:35/34
	20:55	20:24		19:32	18:40	16:58			16:45	14:35-15:09/34
14	05:52	06:23	18:27-19:17/50	06:55	07:28	07:06	14:23-14:52/29		07:38	14:00-14:35/35
	20:54	20:22	19:17-19:22/5	19:30	18:38	16:57			16:45	14:35-15:09/34
15	05:53	06:24	18:27-19:19/52	06:56	07:29	07:07	14:22-14:53/31		07:39	14:00-14:36/36
	20:53	20:21	19:19-19:22/3	19:28	18:36	16:56			16:45	14:36-15:10/34
16	05:54	06:25	18:27-19:20/53	06:57	07:30	07:09	14:21-14:55/34		07:40	14:01-14:37/36
	20:53	20:19	19:20-19:23/3	19:27	18:35	16:55			16:45	14:37-15:10/33
17	05:55	06:26	18:27-19:21/54	06:58	07:32	07:10	14:20-14:56/36		07:40	14:02-14:38/36
	20:52	20:18	19:21-19:23/2	19:25	18:33	16:54			16:46	14:38-15:11/33
18	05:56	06:27	18:28-19:22/54	07:00	07:33	07:11	14:19-14:57/38		07:41	14:01-14:38/37
	20:52	20:17	19:22-19:23/1	19:23	18:32	16:53			16:46	14:38-15:11/33
19	05:57	06:28	18:28-19:22/54	07:01	07:34	07:12	14:19-14:58/39		07:42	14:02-14:39/37
	20:51	20:15	19:22-19:23/1	19:21	18:30	16:53			16:46	14:39-15:12/33
20	05:57	06:29	18:29-19:23/54	07:02	07:35	07:13	14:19-14:59/40		07:42	14:02-14:39/37
	20:50	20:13		19:19	18:29	16:52			16:47	14:39-15:12/33
21	05:58	18:45-18:56/11	06:30	18:29-19:23/54	07:03	07:36	07:15	14:18-14:59/41	07:43	14:03-14:40/37
	20:49	20:12		19:18	18:27	16:51			16:47	14:40-15:12/32
22	05:59	18:43-18:59/16	06:31	18:30-19:22/52	07:04	07:38	07:16	14:18-14:59/41	07:43	14:03-14:40/37
	20:48	20:10		19:16	18:26	16:50			16:48	14:40-15:12/32
23	06:00	18:42-19:01/19	06:32	18:31-19:21/50	07:05	07:39	07:17	14:18-15:01/43	07:44	14:04-14:41/37
	20:48	20:09		19:14	18:24	16:50			16:48	14:41-15:13/32
24	06:01	18:40-19:02/22	06:33	18:33-19:21/48	07:06	07:40	07:18	14:18-15:01/43	07:44	14:04-14:41/37
	20:47	20:07		19:12	18:23	16:49			16:49	14:41-15:14/33
25	06:02	18:39-19:04/25	06:34	18:36-18:56/20	07:07	07:41	07:19	14:17-15:01/44	07:45	14:05-14:42/37
	20:46	20:06	18:57-19:20/23	19:11	18:21	16:49			16:50	14:42-15:15/33
26	06:03	18:38-19:05/27	06:35	18:39-18:53/14	07:08	07:42	07:21	14:17-15:02/45	07:45	14:06-14:42/36
	20:45	20:04	18:57-19:20/23	19:09	18:20	16:48			16:50	14:42-15:15/33
27	06:04	18:37-19:06/29	06:36	18:59-19:19/20	07:09	07:44	07:22	14:18-15:03/45	07:45	14:06-14:42/36
	20:44	20:02		19:07	18:18	16:48			16:51	14:42-15:15/33
28	06:05	18:35-19:06/31	06:37	19:00-19:18/18	07:10	07:45	07:23	14:18-15:03/45	07:46	14:06-14:42/36
	20:43	20:01		19:05	18:17	16:47			16:52	14:42-15:15/33
29	06:06	18:34-19:07/33	06:38	19:01-19:16/15	07:11	07:46	07:24	14:11-14:14/3	07:46	14:08-14:43/35
	20:42	19:58		19:04	18:16	16:47	14:18-15:04/46		16:52	14:43-15:17/34
30	06:07	18:33-19:08/35	06:39	19:02-19:14/12	07:12	07:47	07:25	14:07-14:19/12	07:46	14:08-14:43/35
	20:41	19:56		19:02	18:14	16:46	14:19-15:04/45		16:53	14:43-15:17/34
31	06:08	18:32-19:08/36	06:41	19:06-19:09/3		07:49			07:46	14:09-14:43/34
	20:40	19:54			18:13				16:54	14:43-15:17/34
Potential sun hours	463		431		375	343	294		283	
Sum of minutes with flicker	284		1310		0	0	776		2098	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 11:06 AM / 48

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110WTG: 100 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (134)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

January		February		March		April		May		June	
1	07:47 15:30-15:57/27 16:55	07:32 17:31		06:54 07:14-07:28/14 18:06	07:01 19:43			06:14 06:34-06:38/4 20:15		05:43 20:47	
2	07:47 15:31-15:58/27 16:56	07:31 17:32		06:52 07:12-07:27/15 18:08	06:59 19:44			06:12 06:32-06:38/6 20:16		05:43 20:47	
3	07:47 15:31-15:58/27 16:57	07:30 17:33		06:51 07:11-07:27/16 18:09	06:58 19:45			06:11 06:31-06:38/7 20:17		05:42 20:48	
4	07:47 15:32-15:58/26 16:58	07:29 17:34		06:49 07:09-07:26/17 18:10	06:56 19:46			06:10 06:30-06:39/9 20:19		05:42 20:49	
5	07:47 15:32-15:59/27 16:59	07:28 17:36		06:48 07:07-07:24/17 18:11	06:54 19:47			06:08 06:29-06:39/10 20:20		05:42 20:50	
6	07:47 15:33-16:00/27 16:59	07:27 17:37		06:46 07:06-07:23/17 18:12	06:53 19:48			06:07 06:27-06:38/11 20:21		05:41 20:50	
7	07:47 15:34-16:00/26 17:00	07:25 17:38		06:44 07:04-07:21/17 18:14	06:51 19:49			06:06 06:26-06:38/12 20:22		05:41 20:51	
8	07:47 15:33-16:00/27 17:02	07:24 17:40		07:43 08:02-08:18/16 19:15	06:49 19:50			06:04 06:25-06:38/13 20:23		05:41 20:52	
9	07:47 15:34-16:00/26 17:03	07:23 17:41		07:41 08:01-08:12/11 19:16	06:48 19:52			06:03 06:24-06:38/14 20:24		05:40 20:52	
10	07:46 15:35-16:01/26 17:04	07:22 17:42		07:39 07:59-08:11/12 19:17	06:46 19:53			06:02 06:23-06:38/15 20:25		05:40 20:53	
11	07:46 15:35-16:00/25 17:05	07:20 17:44		07:38 07:57-08:11/14 19:18	06:44 19:54			06:01 06:22-06:37/15 20:26		05:40 20:53	
12	07:46 15:36-16:01/25 17:06	07:19 17:45		07:36 07:55-08:10/15 19:20	06:43 19:55			06:00 06:21-06:37/16 20:27		05:40 20:54	
13	07:45 15:37-16:01/24 17:07	07:18 17:46		07:34 07:54-08:10/16 19:21	06:41 19:56			05:59 06:20-06:36/16 20:28		05:40 20:55	
14	07:45 15:38-16:00/22 17:08	07:16 17:48		07:32 07:52-08:08/16 19:22	06:39 19:57			05:58 06:19-06:35/16 20:29		05:40 20:55	
15	07:45 15:39-16:01/22 17:09	07:15 17:49		07:31 07:50-08:07/17 19:23	06:38 19:58			05:57 06:18-06:35/17 20:31		05:40 20:55	
16	07:44 15:40-16:00/20 17:10	07:14 17:50		07:29 07:49-08:06/17 19:24	06:36 19:59			05:56 06:17-06:34/17 20:32		05:40 20:56	
17	07:44 15:41-16:00/19 17:12	07:12 17:51		07:27 07:51-08:03/12 19:25	06:34 20:01			05:55 06:16-06:32/16 20:33		05:40 20:56	
18	07:43 15:42-15:59/17 17:13	07:11 17:53		07:26 07:54-07:58/4 19:27	06:33 20:01			05:54 06:15-06:31/16 20:34		05:40 20:57	
19	07:43 15:44-15:58/14 17:14	07:09 17:54		07:24 18:06-18:30/24 19:28	06:31 20:02			05:53 06:14-06:29/15 20:35		05:40 20:57	
20	07:42 15:46-15:58/12 17:15	07:08 17:55		07:22 18:07-18:28/21 19:29	06:30 20:03			05:52 06:13-06:26/13 20:36		05:40 20:57	
21	07:41 15:49-15:55/6 17:16	07:06 17:56		07:20 18:09-18:27/18 19:30	06:28 20:04			05:51 06:13-06:25/12 20:37		05:40 20:58	
22	07:41 17:18	07:05 17:58		07:19 18:11-18:24/13 19:31	06:27 20:05			05:50 06:16-06:24/8 20:38		05:40 20:58	
23	07:40 17:19	07:03 07:24-07:25/1 17:59		07:17 18:15-18:19/4 19:32	06:25 20:06			05:49 20:39		05:41 20:58	
24	07:39 17:20	07:02 07:22-07:26/4 18:00		07:15 19:33	06:24 20:07			05:48 20:40		05:41 20:58	
25	07:38 17:21	07:00 07:20-07:26/6 18:01		07:13 19:35	06:22 20:08			05:48 20:40		05:41 20:58	
26	07:38 17:23	06:59 07:19-07:28/9 17:16-17:20/4 18:03		07:12 19:36	06:21 20:10			05:47 20:41		05:42 20:58	
27	07:37 17:24	06:57 07:17-07:27/10 17:19-17:20/1 18:04		07:10 19:37	06:19 20:11			05:46 20:42		05:42 20:59	
28	07:36 17:25	06:56 07:16-07:28/12 18:05		07:08 19:38	06:18 20:12			05:46 20:43		05:42 20:59	
29	07:35 17:27	18:05 16:58-17:21/23 17:27		07:06 19:39	06:16 20:13			05:45 20:44		05:43 20:59	
30	07:34 17:28	17:28		07:05 19:40	06:15 20:14	06:35-06:37/2		05:44 20:45		05:43 20:59	
31	07:33 17:29	17:29		07:03 19:41	06:14 20:46			05:44 20:46		05:44 20:59	
Potential sun hours		294		370	401	452		457		0	
Sum of minutes with flicker		472	131	898	2	278					

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 11:06 AM / 49

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110WTG: 100 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (134)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

July		August		September		October		November		December	
1	05:44	06:09	06:31-06:47/16	06:42		07:14	07:34-07:49/15	06:50		07:26	15:17-15:42/25
	20:58	20:39		19:53		19:00	17:37-18:13/36	17:12		16:46	
2	05:44	06:10	06:32-06:47/15	06:43		07:15	07:35-07:49/14	06:51		07:27	15:18-15:44/26
	20:58	20:38		19:51		18:58	17:36-18:12/36	17:10		16:46	
3	05:45	06:11	06:33-06:47/14	06:44		07:16	07:36-07:49/13	06:52		07:29	15:18-15:44/26
	20:58	20:37		19:49		18:57	17:34-18:11/37	17:09		16:45	
4	05:45	06:12	06:34-06:48/14	06:45		07:17	07:37-07:48/11	06:54		07:30	15:18-15:45/27
	20:58	20:36		19:48		18:55	17:33-18:10/37	17:08		16:45	
5	05:46	06:13	06:35-06:48/13	06:46		07:18	07:38-07:48/10	06:55		07:31	15:19-15:45/26
	20:58	20:34		19:46		18:53	17:33-18:08/35	17:07		16:45	
6	05:47	06:14	06:36-06:48/12	06:47		07:19	07:40-07:57/17	06:56		07:32	15:19-15:46/27
	20:58	20:33		19:44		18:52	17:32-18:06/34	17:05		16:45	
7	05:47	06:15	06:37-06:48/11	06:48		07:20	07:41-07:58/17	06:57		07:33	15:19-15:46/27
	20:57	20:32		19:42		18:50	17:32-18:04/32	17:04		16:45	
8	05:48	06:16	06:38-06:47/9	06:49		07:21	07:42-07:59/17	06:59		07:33	15:20-15:47/27
	20:57	20:31		19:41		18:48	17:31-18:00/29	17:03		16:45	
9	05:49	06:17	06:39-06:47/8	06:50		07:23	07:43-08:00/17	07:00		07:34	15:20-15:47/27
	20:57	20:29		19:39		18:46	17:31-17:59/28	17:02		16:45	
10	05:49	06:18	06:40-06:47/7	06:51		07:24	07:44-08:00/16	07:01		07:35	15:20-15:47/27
	20:56	20:28		19:37		18:45	17:30-17:58/28	17:01		16:45	
11	05:50	06:19	06:41-06:46/5	06:52		07:25	07:45-08:00/15	07:02		07:36	15:20-15:47/27
	20:56	20:27		19:35		18:43	17:30-17:57/27	17:00		16:45	
12	05:51	06:20	06:42-06:45/3	06:53		07:26	07:47-08:01/14	07:04		07:37	15:21-15:48/27
	20:55	20:25		19:34		18:41	17:30-17:56/26	16:59		16:45	
13	05:52	06:21	06:43-06:45/2	06:54		07:27	07:48-08:01/13	07:05		07:38	15:21-15:48/27
	20:55	20:24		19:32		18:40	17:31-17:55/24	16:58		16:45	
14	05:52	06:23		06:55		07:28	07:49-08:00/11	07:06		07:39	15:22-15:49/27
	20:54	20:23		19:30		18:38	17:31-17:54/23	16:57		16:45	
15	05:53	06:24		06:56		07:29	07:50-08:00/10 17:51-17:52/1	07:07		07:39	15:22-15:49/27
	20:54	20:21		19:28		18:37	17:32-17:51/19	16:56		16:45	
16	05:54	06:25		06:58		07:31	07:51-07:59/8	07:09		07:40	15:23-15:49/26
	20:53	20:20		19:27		18:35	17:33-17:51/18	16:55		16:45	
17	05:55	06:26		06:59		07:32	07:53-07:59/6	07:10		07:41	15:24-15:50/26
	20:52	20:18		19:25		18:33	17:34-17:48/14	16:54		16:46	
18	05:56	06:27		07:00		07:33	07:54-07:57/3	07:11		07:41	15:23-15:50/27
	20:52	20:17		19:23		18:32	17:38-17:45/7	16:53		16:46	
19	05:56	06:28		07:01		07:34		07:12		07:42	15:24-15:51/27
	20:51	20:15		19:21		18:30		16:53		16:46	
20	05:57	06:29		07:02		07:35		07:14		07:43	15:25-15:52/27
	20:50	20:14		19:20		18:29		16:52		16:47	
21	05:58	06:27-06:31/4	06:30	07:03	17:57-18:08/11	07:37		07:15	15:24-15:30/6	07:43	15:25-15:52/27
	20:50	20:12		19:18		18:27		16:51		16:47	
22	05:59	06:25-06:34/9	06:31	07:04	17:54-18:11/17	07:38		07:16	15:22-15:33/11	07:44	15:26-15:53/27
	20:49	20:11		19:16		18:26		16:50		16:48	
23	06:00	06:23-06:36/13	06:32	07:05	17:52-18:12/20	07:39		07:17	15:21-15:35/14	07:44	15:26-15:53/27
	20:48	20:09		19:14		18:24		16:50		16:48	
24	06:01	06:24-06:38/14	06:33	07:06	17:50-18:13/23	07:40		07:18	15:19-15:36/17	07:45	15:26-15:53/27
	20:47	20:07		19:12		18:23		16:49		16:49	
25	06:02	06:25-06:40/15	06:34	07:07	17:48-18:13/25	07:41		07:20	15:18-15:37/19	07:45	15:27-15:54/27
	20:46	20:06		19:11		18:21		16:49		16:50	
26	06:03	06:26-06:42/16	06:35	07:08	07:34-07:45/11	07:43		07:21	15:19-15:39/20	07:45	15:27-15:54/27
	20:45	20:04		19:09	17:47-18:13/26	18:20		16:48		16:50	
27	06:04	06:27-06:43/16	06:36	07:09	07:31-07:47/16	07:44		07:22	15:18-15:40/22	07:46	15:28-15:54/26
	20:44	20:03		19:07	17:47-18:14/27	18:18		16:48		16:51	
28	06:05	06:28-06:45/17	06:37	07:10	07:31-07:48/17	07:45		07:23	15:18-15:40/22	07:46	15:29-15:56/27
	20:43	20:01		19:05	17:45-18:14/29	18:17		16:47		16:52	
29	06:06	06:29-06:46/17	06:38	07:11	07:32-07:49/17	07:46		07:24	15:17-15:41/24	07:46	15:29-15:56/27
	20:42	19:58		19:04	17:41-18:14/33	18:16		16:47		16:52	
30	06:07	06:30-06:46/16	06:40	07:13	07:33-07:49/16	07:47		07:25	15:17-15:42/25	07:47	15:29-15:56/27
	20:41	19:56		19:02	17:39-18:13/34	18:14		16:46		16:53	
31	06:08	06:30-06:46/16	06:41			07:49				07:47	15:30-15:57/27
	20:40	19:54				18:13				16:54	
Potential sun hours	464	431		375		343		294	180	829	
Sum of minutes with flicker	153	129		322		718					

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

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Licensed user:

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US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110WTG: 101 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (144)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	
1	07:47 16:55	07:32 17:31	06:54 18:07	07:01 19:43	06:14 20:15	06:20-07:05/45 20:47 07:05-07:14/9	
2	07:47 16:56	07:31 17:32	06:53 18:08	07:00 19:44	06:12 20:16	06:32-07:20/48 05:43 06:20-07:05/45 20:47 07:05-07:12/7	
3	07:47 16:57	07:30 17:33	06:51 18:09	06:58 19:45	06:11 20:18	06:31-07:21/50 05:42 06:21-07:05/44 20:48 07:05-07:12/7	
4	07:47 16:58	07:29 17:35	06:49 18:10	17:44-17:48/4 19:46	06:10 20:19	06:31-06:54/23 06:51-07:22/31	05:42 06:20-07:04/44 20:49 07:04-07:10/6
5	07:47 16:59	07:28 17:36	06:48 18:11	17:41-17:49/8 19:47	06:08 20:20	06:30-06:57/27 06:55-07:22/27	05:42 06:11-06:17/6 07:04-07:10/6 20:50 06:21-07:04/43
6	07:47 17:00	07:27 17:37	06:46 18:13	17:40-17:51/11 19:48	06:07 20:21	06:29-06:58/29 06:56-07:22/26	05:41 06:10-06:19/9 07:05-07:09/4 20:50 06:22-07:05/43
7	07:47 17:01	07:25 17:39	17:08-17:14/6 18:14	06:44 19:49	06:06 20:22	06:29-07:00/31 06:58-07:22/24	05:41 06:09-06:20/11 07:05-07:08/3 20:51 06:22-07:05/43
8	07:47 17:02	07:24 17:40	17:07-17:16/9 19:15	07:43 19:51	06:05 20:23	06:29-07:00/31 06:59-07:22/23	05:41 06:07-06:21/14 20:52 06:22-07:04/42
9	07:47 17:03	07:23 17:41	17:05-17:17/12 19:16	07:41 19:52	06:03 20:24	06:29-07:02/33 07:01-07:23/22	05:41 06:07-06:22/15 20:52 06:23-07:03/40
10	07:46 17:04	07:22 17:42	17:04-17:18/14 19:17	07:39 19:53	06:02 20:25	07:07-07:25/18 07:19-19:30/11	05:40 06:07-07:03/56 20:53
11	07:46 17:05	07:21 17:44	17:04-17:20/16 19:19	07:38 19:54	06:01 20:26	06:27-07:03/36 07:06-07:27/21	05:40 06:07-06:23/16 20:54 06:24-07:03/39
12	07:46 17:06	07:19 17:45	17:04-17:22/18 19:20	07:36 19:55	06:00 20:27	06:27-07:03/39 07:05-07:27/22	05:40 06:07-07:03/56 20:54
13	07:46 17:07	07:18 17:46	17:03-17:23/20 19:21	07:34 19:56	05:59 20:29	06:23-07:04/41 07:04-07:22/18	05:40 06:07-07:03/56 20:55
14	07:45 17:08	07:17 17:48	17:03-17:24/21 19:22	07:33 19:57	05:58 20:30	06:22-07:04/42 07:04-07:22/18	05:40 06:07-07:03/56 20:55
15	07:45 17:09	07:15 17:49	17:02-17:25/23 19:23	07:31 19:58	05:57 20:31	06:21-07:04/43 07:04-07:22/18	05:40 06:07-07:03/56 20:56
16	07:44 17:10	07:14 17:50	17:03-17:27/24 19:24	07:29 20:00	05:56 20:32	06:20-07:05/45 07:05-07:22/17	05:40 06:07-07:03/56 20:56
17	07:44 17:12	07:12 17:51	17:04-17:27/23 19:26	07:27 20:00	05:55 20:33	06:20-07:05/45 07:05-07:21/16	05:40 06:07-07:03/56 20:56
18	07:43 17:13	07:11 17:53	17:03-17:26/23 19:27	07:26 20:01	05:54 20:34	06:19-07:05/46 07:05-07:21/16	05:40 06:07-07:03/56 20:57
19	07:43 17:14	07:10 17:54	17:05-17:25/20 19:28	07:24 20:02	05:53 20:35	06:19-07:05/46 07:05-07:20/15	05:40 06:07-07:03/56 20:57
20	07:42 17:15	07:08 17:55	17:05-17:24/19 19:29	07:22 20:03	05:52 20:36	06:18-07:05/47 07:05-07:20/15	05:40 06:07-07:03/56 20:57
21	07:41 17:17	07:07 17:57	17:07-17:23/16 19:30	07:20 20:04	05:51 20:37	06:18-07:05/47 07:05-07:19/14	05:40 06:07-07:03/56 20:58
22	07:41 17:18	07:05 17:58	17:09-17:20/11 19:31	07:19 20:05	05:50 20:38	06:19-07:06/47 07:06-07:20/14	05:41 06:08-07:04/56 20:58
23	07:40 17:19	07:04 17:59		07:17 19:32	05:49 20:39	06:18-07:06/48 07:06-07:19/13	05:41 06:08-07:04/56 20:58
24	07:39 17:20	07:02 18:00		07:15 19:34	05:49 20:40	06:18-07:05/47 07:05-07:18/13	05:41 06:08-07:04/56 20:58
25	07:38 17:22	07:01 18:02		07:13 19:35	05:48 20:41	06:19-07:06/47 07:06-07:18/12	05:41 06:09-07:05/56 20:58
26	07:38 17:23	06:59 18:03		07:12 19:36	05:47 20:42	06:19-07:06/47 07:06-07:17/11	05:42 06:09-07:05/56 20:59
27	07:37 17:24	06:57 18:04		07:10 19:37	05:46 20:42	06:18-07:05/47 07:05-07:16/11	05:42 06:09-07:05/56 20:59
28	07:36 17:25	06:56 18:05		07:08 19:38	05:46 20:43	06:19-07:06/47 07:06-07:16/10	05:42 06:10-07:06/56 20:59
29	07:35 17:27			07:07 19:39	05:45 20:44	06:19-07:05/46 07:05-07:15/10	05:43 06:10-07:06/56 20:59
30	07:34 17:28			07:05 19:40	05:44 20:45	06:20-07:06/46 07:06-07:15/9	05:43 06:11-07:07/56 20:59
31	07:33 17:29			07:03 19:42	05:44 20:46	06:19-07:05/46 07:05-07:14/9	
hrs	294	295	370	401	452	1761	1661
0		278	239	893			

Table layout: For each day in each month the following matrix apply

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Project:

2015-08-31_Arkwright Summit_SFA

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Licensed user:

EDR

217 Montgomery St.

US-SYRACUSE, NY 13202

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Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110WTG: 101 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (144)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

July		August		September		October		November		December	
1	05:44 06:11-07:07/56	06:09 06:35-07:13/38		06:42 07:05-07:26/21	07:14 18:15-18:38/23	06:50 16:34-16:48/14	07:27				
	20:59	20:39 07:13-07:33/20		19:53 19:17-19:31/14	19:00	17:12	16:46				
2	05:44 06:12-07:08/56	06:10 06:37-07:13/36		06:43 07:06-07:24/18	07:15 18:14-18:36/22	06:51 16:35-16:46/11	07:28				
	20:58	20:38 07:13-07:33/20		19:51 19:18-19:29/11	18:59	17:10	16:46				
3	05:45 06:12-06:27/15	06:11 06:39-07:13/34		06:44 07:07-07:23/16	07:16 18:13-18:34/21	06:53 16:37-16:46/9	07:29				
	20:58 06:28-07:08/40	20:37 07:12-07:33/21		19:49 19:19-19:27/8	18:57	17:09	16:45				
4	05:45 06:13-06:27/14	06:12 06:39-07:11/32		06:45 07:08-07:20/12	07:17 18:13-18:32/19	06:54 16:38-16:44/6	07:30				
	20:58 06:28-07:09/41	20:36 07:10-07:32/22		19:48 19:20-19:26/6	18:55	17:08	16:45				
5	05:46 06:14-06:26/12 07:10-07:12/2	06:13 06:39-07:09/30		06:46 07:13-07:15/2	07:18 18:13-18:30/17	06:55 16:41-16:42/1	07:31				
	20:58 06:28-07:10/42	20:34 07:08-07:32/24		19:46 19:22-19:24/2	18:53	17:07	16:45				
6	05:47 06:15-06:26/11 07:11-07:14/3	06:14 06:39-07:09/30		06:47	07:19 18:14-18:29/15	06:56	07:32				
	20:58 06:28-07:11/43	20:33 07:07-07:32/25		19:44	18:52	17:05	16:45				
7	05:47 06:16-06:24/8 07:10-07:15/5	06:15 06:40-07:07/27		06:48	07:20 18:15-18:27/12	06:58	07:33				
	20:57 06:27-07:10/43	20:32 07:05-07:31/26		19:43	18:50	17:04	16:45				
8	05:48 06:19-06:22/3 07:11-07:17/6	06:16 06:40-07:04/24		06:49	07:22 18:16-18:25/9	06:59	07:34				
	20:57 06:28-07:11/43	20:31 07:02-07:31/29		19:41	18:48	17:03	16:45				
9	05:49 06:28-07:12/44	06:17 06:41-07:30/49		06:50	07:23 18:17-18:24/7	07:00	07:35				
	20:57 07:12-07:19/7	20:29		19:39	18:47	17:02	16:45				
10	05:49 06:27-07:12/45	06:18 06:41-07:31/50		06:51	07:24 18:20-18:22/2	07:01	07:35				
	20:56 07:12-07:19/7	20:28		19:37	18:45	17:01	16:45				
11	05:50 06:28-07:12/44	06:19 06:42-07:30/48		06:52	07:25	07:03	07:36				
	20:56 07:12-07:21/9	20:27		19:36	18:43	17:00	16:45				
12	05:51 06:28-07:13/45	06:21 06:44-07:29/45		06:53	07:26	07:04	07:37				
	20:55 07:13-07:22/9	20:25		19:34	18:42	16:59	16:45				
13	05:52 06:28-07:14/46	06:22 06:45-07:28/43		06:54	07:27	07:05	07:38				
	20:55 07:14-07:23/9	20:24		19:32	18:40	16:58	16:45				
14	05:52 06:27-07:13/46	06:23 06:49-06:53/4 07:27-07:28/1		06:56	07:28	07:06	07:39				
	20:54 07:13-07:23/10	20:23 06:55-07:27/32		19:30	18:38	16:57	16:45				
15	05:53 06:27-07:14/47	06:24 06:54-07:26/32		06:57	07:30	07:08	07:39				
	20:54 07:14-07:24/10	20:21 07:26-07:27/1		19:29	18:37	16:56	16:45				
16	05:54 06:28-07:14/46	06:25 06:54-07:24/30		06:58	07:31	07:09	07:40				
	20:53 07:14-07:25/11	20:20 07:24-07:27/3		19:27	18:35	16:55	16:46				
17	05:55 06:28-07:15/47	06:26 06:54-07:22/28		06:59	07:32	07:10	07:41				
	20:53 07:15-07:26/11	20:18 07:22-07:27/5		19:25	18:33	16:54	16:46				
18	05:56 06:28-07:15/47	06:27 06:54-07:20/26		07:00	07:33	07:11	07:42				
	20:52 07:15-07:27/12	20:17 07:19-07:27/8		19:23	18:32	16:53	16:46				
19	05:57 06:28-07:16/48	06:28 06:54-07:16/22		07:01	07:34 17:42-17:49/7	07:13	07:42				
	20:51 07:16-07:28/12	20:15 07:15-07:26/11		19:21	18:30	16:53	16:47				
20	05:57 06:28-07:15/47	06:29 06:54-07:25/31		07:02	07:35 17:38-17:51/13	07:14	07:43				
	20:50 07:15-07:28/13	20:14 19:31-19:33/2		19:20	18:29	16:52	16:47				
21	05:58 06:28-07:15/47	06:30 06:54-07:25/31		07:03	07:37 17:37-17:54/17	07:15	07:43				
	20:50 07:15-07:29/14	20:12 19:26-19:37/11		19:18	18:27	16:51	16:47				
22	05:59 06:28-07:15/47	06:31 06:54-07:24/30 19:24-19:39/15		07:04	07:38 17:35-17:55/20	07:16	07:44				
	20:49 07:15-07:30/15	20:11 07:24-07:27/3		19:16	18:26	16:50	16:48				
23	06:00 06:29-07:16/47	06:32 06:55-07:23/28 19:22-19:40/18		07:05	07:39 17:34-17:55/21	07:17	07:44				
	20:48 07:16-07:30/14	20:09 07:23-07:28/5		19:14	18:24	16:50	16:48				
24	06:01 06:29-07:16/47	06:33 06:56-07:22/26 19:21-19:41/20		07:06	07:40 17:33-17:55/22	07:19	07:45				
	20:47 07:16-07:31/15	20:08 07:22-07:28/6		19:13	18:23	16:49	16:49				
25	06:02 06:30-07:16/46	06:34 06:58-07:20/22 19:20-19:41/21		07:07 18:25-18:31/6	07:41 17:33-17:57/24	07:20	07:45				
	20:46 07:16-07:31/15	20:06 07:20-07:29/9		19:11	18:21	16:49	16:50				
26	06:03 06:30-07:16/46	06:35 07:00-07:17/17 19:19-19:41/22		07:08 18:22-18:35/13	07:43 17:32-17:56/24	07:21	07:46				
	20:45 07:16-07:32/16	20:04 07:17-07:29/12		19:09	18:20	16:48	16:50				
27	06:04 06:31-07:15/44	06:36 07:05-07:13/8 19:18-19:39/21		07:09 18:20-18:36/16	07:44 17:32-17:55/23	07:22	07:46				
	20:44 07:15-07:32/17	20:03 07:13-07:29/16		19:07	18:18	16:48	16:51				
28	06:05 06:31-07:15/44	06:38 07:05-07:28/23		07:10 18:18-18:37/19	07:45 17:33-17:54/21	07:23	07:46				
	20:43 07:15-07:32/17	20:01 19:18-19:37/19		19:06	18:17	16:47	16:52				
29	06:06 06:32-07:15/43	06:39 07:05-07:28/23		07:12 18:17-18:38/21	07:46 17:32-17:52/20	07:24	07:46				
	20:42 07:15-07:33/18	20:00 19:17-19:36/19		19:04	18:16	16:47	16:52				
30	06:07 06:33-07:15/42	06:40 07:05-07:28/23		07:13 18:15-18:38/23	07:48 17:32-17:50/18	07:25	07:47				
	20:41 07:15-07:33/18	19:56 19:17-19:34/17		19:02	18:14	16:46	16:53				
31	06:08 06:34-07:14/40	06:41 07:05-07:27/22			07:49 17:34-17:50/16		07:47				
	20:40 07:14-07:33/19	19:55 19:17-19:32/15			18:13		16:54				
Potential sun hours	464	431		375	343	294	283				
Sum of minutes with flicker	1786	1402		208	393	41	0				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 11:06 AM / 52

Licensed user:

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(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110WTG: 102 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (146)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

January		February		March		April		May		June	
1	07:47 16:55	07:32 17:31	06:54 18:06	16:56-17:09/13	18:06	07:01 19:43	07:21-07:42/21	06:14 20:15	06:34-07:00/26	05:43 20:47	06:06-06:42/36
2	07:47 16:56	07:31 17:32	06:52 18:08	16:59-17:05/6	18:06	06:59 19:44	07:19-07:41/22	06:12 20:16	06:32-06:59/27	05:43 20:47	06:05-06:41/36
3	07:47 16:57	07:30 17:33	06:51 18:09	17:18-17:31/13	18:09	06:58 19:45	07:17-07:39/22	06:11 20:17	06:31-06:58/27	05:42 20:48	06:05-06:41/36
4	07:47 16:58	07:29 17:34	06:49 18:10	17:15-17:33/18	18:10	06:56 19:46	07:15-07:37/22	06:10 20:19	06:30-06:58/28	05:42 20:49	06:04-06:39/35
5	07:47 16:59	07:28 17:36	06:48 18:11	17:14-17:33/19	18:11	06:54 19:47	07:14-07:36/22	06:08 20:20	06:29-06:57/28	05:42 20:50	06:04-06:39/35
6	07:47 17:00	07:26 17:37	06:46 18:12	17:13-17:35/22	18:12	06:53 19:48	07:12-07:32/20	06:07 20:21	06:27-06:56/29	05:41 20:50	06:04-06:38/34
7	07:47 17:01	07:25 17:38	06:44 18:14	17:12-17:35/23	18:14	06:51 19:49	07:10-07:29/19	06:06 20:22	06:26-06:55/29	05:41 20:51	06:04-06:37/33
8	07:47 17:02	07:24 17:40	07:43 19:15	18:11-18:36/25	19:15	06:49 19:50	07:09-07:29/20	06:04 20:23	06:25-06:54/29	05:41 20:52	06:03-06:33/30
9	07:47 17:03	07:23 17:41	07:41 19:16	18:11-18:38/27	19:16	06:48 19:52	07:07-07:29/22	06:03 20:24	06:24-06:53/29	05:40 20:52	06:03-06:42/39
10	07:46 17:04	07:22 17:42	07:39 19:17	18:11-18:40/29	19:17	06:46 19:53	07:05-07:28/23	06:02 20:25	06:23-06:51/28	05:40 20:53	06:03-06:42/39
11	07:46 17:05	07:20 17:44	07:38 19:18	18:11-18:40/29	19:18	06:44 19:54	07:04-07:28/24	06:01 20:26	06:22-06:49/27	05:40 20:53	06:03-06:42/39
12	07:46 17:06	07:19 17:45	07:36 19:20	18:11-18:41/30	19:20	06:43 19:55	07:02-07:26/24	06:00 20:27	06:21-06:47/26	05:40 20:54	06:03-06:42/39
13	07:45 17:07	07:18 17:46	07:34 19:21	18:12-18:42/30	19:21	06:41 19:56	07:00-07:25/25	05:59 20:28	06:20-06:49/29	05:40 20:54	06:03-06:43/40
14	07:45 17:08	07:16 17:48	07:32 19:22	18:12-18:44/2	19:22	06:39 19:57	06:59-07:24/25	05:58 20:29	06:19-06:49/30	05:40 20:55	06:03-06:43/40
15	07:45 17:09	07:15 17:49	07:31 19:23	18:12-18:44/2	19:23	06:38 19:58	07:50-07:53/3	05:57 20:30	06:18-06:49/31	05:40 20:55	06:03-06:43/40
16	07:44 17:10	07:14 17:50	07:29 19:24	18:41-18:44/3	19:24	06:36 19:59	07:48-07:53/5	05:56 20:32	06:17-06:48/31	05:40 20:56	06:03-06:43/40
17	07:44 17:12	07:12 17:51	07:27 19:25	18:42-18:45/3	19:25	06:34 20:01	06:54-07:22/28	05:55 20:33	06:16-06:48/32	05:40 20:56	06:03-06:43/40
18	07:43 17:13	07:11 17:53	07:26 19:27	18:41-18:45/4	19:27	06:33 20:01	06:52-07:20/28	05:54 20:34	06:15-06:48/33	05:40 20:57	06:03-06:43/40
19	07:42 17:14	07:09 17:54	07:24 19:28	18:39-18:44/5	19:28	06:31 20:02	07:43-07:53/10	05:53 20:35	06:14-06:47/33	05:40 20:57	06:03-06:43/40
20	07:42 17:15	07:08 17:55	07:22 19:29	18:38-18:43/5	19:29	06:30 20:03	06:49-07:17/28	05:52 20:36	06:13-06:47/34	05:40 20:57	06:03-06:43/40
21	07:41 17:16	07:06 17:56	07:20 19:30	18:18-18:43/25	19:30	06:28 20:04	06:48-07:16/28	05:51 20:37	06:12-06:46/34	05:40 20:58	06:03-06:43/40
22	07:41 17:18	07:05 17:58	07:19 19:31	18:19-18:42/23	19:31	06:27 20:05	06:46-07:13/27	05:50 20:38	06:12-06:47/35	05:40 20:58	06:04-06:44/40
23	07:40 17:19	07:03 17:59	07:17 19:32	18:21-18:40/19	19:32	06:25 20:06	06:45-07:11/26	05:49 20:39	06:11-06:46/35	05:41 20:58	06:04-06:44/40
24	07:39 17:20	07:02 18:00	07:15 19:33	18:22-18:38/16	19:33	06:24 20:07	06:43-07:00/17	05:48 20:39	06:10-06:45/35	05:41 20:58	06:04-06:44/40
25	07:38 17:21	07:00 18:01	07:13 19:35	18:25-18:37/12	19:35	06:22 20:08	06:42-07:01/19	05:48 20:40	06:09-06:45/36	05:41 20:58	06:04-06:44/40
26	07:37 17:23	06:59 18:03	07:12 19:36	18:14-18:41/25	19:36	06:21 20:10	06:41-07:01/20	05:47 20:41	06:09-06:45/36	05:42 20:58	06:05-06:45/40
27	07:37 17:24	06:57 18:04	07:10 19:37	18:14-18:41/25	19:37	06:19 20:11	06:39-07:01/22	05:46 20:42	06:08-06:44/36	05:42 20:58	06:05-06:45/40
28	07:36 17:25	06:56 18:05	07:08 19:38	18:14-18:39/23	19:38	06:18 20:12	06:38-07:01/23	05:46 20:43	06:08-06:44/36	05:42 20:59	06:06-06:46/40
29	07:35 17:27		07:06 19:39	18:14-18:39/23	19:39	06:16 20:13	06:36-07:00/24	05:45 20:44	06:07-06:43/36	05:43 20:59	06:06-06:46/40
30	07:34 17:28		07:05 19:40	18:14-18:39/23	19:40	06:15 20:14	06:35-07:00/25	05:44 20:45	06:07-06:43/36	05:43 20:58	06:06-06:45/39
31	07:33 17:29		07:03 19:41	18:14-18:39/23	19:41			05:44 20:46	06:06-06:42/36		
Potential sun hours		294	295	370	401	401	1093	979	1171	457	
Sum of minutes with flicker		0	280	819	1093	979	1171				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 11:06 AM / 53

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110WTG: 102 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (146)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

July		August		September		October		November		December	
------	--	--------	--	-----------	--	---------	--	----------	--	----------	--

1	05:44	06:07-06:46/39	06:09	06:31-06:58/27	06:42	07:03-07:27/24	07:14	17:51-18:21/30	06:50	07:26
	20:58		20:39		19:53	19:10-19:12/2	19:00		17:12	16:46
2	05:44	06:07-06:46/39	06:10	06:32-07:00/28	06:43	07:04-07:27/23	07:15	17:50-18:19/29	06:51	07:27
	20:58		20:38		19:51		18:58		17:10	16:46
3	05:45	06:08-06:47/39	06:11	06:33-07:01/28	06:44	07:05-07:27/22	07:16	17:49-18:18/29	06:52	07:28
	20:58		20:37		19:49		18:57		17:09	16:45
4	05:45	06:09-06:48/39	06:12	06:34-07:03/29	06:45	07:06-07:26/20	07:17	17:48-18:16/28	06:54	07:29
	20:58		20:36		19:48		18:55		17:08	16:45
5	05:46	06:09-06:41/32	06:13	06:35-07:04/29	06:46	07:07-07:26/19	07:18	17:48-18:14/26	06:55	07:30
	20:58	06:41-06:47/6	20:34		19:46		18:53		17:07	16:45
6	05:47	06:10-06:43/33	06:14	06:36-07:05/29	06:47	07:08-07:27/19	07:19	17:48-18:11/23	06:56	07:31
	20:57	06:43-06:48/5	20:33		19:44		18:52	18:10-18:11/1	17:05	16:45
7	05:47	06:10-06:44/34	06:15	06:37-07:06/29	06:48	07:09-07:30/21	07:20	17:49-18:11/22	06:57	07:32
	20:57	06:44-06:48/4	20:32		19:42		18:50		17:04	16:45
8	05:48	06:11-06:46/35	06:16	06:38-07:06/28	06:49	07:10-07:32/22	07:21	17:49-18:10/21	06:59	07:33
	20:57	06:46-06:48/2	20:31		19:41		18:48		17:03	16:45
9	05:49	06:12-06:48/36	06:17	06:39-07:07/28	06:50	07:11-07:33/22	07:23	17:50-18:08/18	07:00	07:34
	20:57	06:48-06:49/1	20:29		19:39		18:46		17:02	16:45
10	05:49	06:12-06:48/36	06:18	06:40-07:07/27	06:51	07:12-07:34/22	07:24	17:51-18:06/15	07:01	07:35
	20:56		20:28		19:37		18:45		17:01	16:45
11	05:50	06:13-06:49/36	06:19	06:41-07:08/27	06:52	07:13-07:35/22	07:25	17:52-18:04/12	07:02	07:36
	20:56		20:27		19:35		18:43		17:00	16:45
12	05:51	06:14-06:50/36	06:20	06:42-07:08/26	06:53	07:14-07:35/21	07:26	17:30-17:40/10	07:04	07:37
	20:55		20:25		19:34		18:41		16:59	16:45
13	05:52	06:15-06:51/36	06:21	06:43-07:08/25	06:54	07:15-07:35/20	07:27	17:29-17:43/14	07:05	07:38
	20:55		20:24	19:13-19:17/4	19:32		18:40		16:58	16:45
14	05:52	06:15-06:51/36	06:23	06:44-07:08/24	06:55	07:16-07:35/19	07:28	17:27-17:44/17	07:06	07:39
	20:54		20:22	19:09-19:21/12	19:30		18:38		16:57	16:45
15	05:53	06:16-06:52/36	06:24	06:45-07:08/23	06:56	07:17-07:35/18	07:29	17:25-17:45/20	07:07	07:39
	20:54		20:21	19:07-19:23/16	19:28		18:37		16:56	16:45
16	05:54	06:17-06:53/36	06:25	06:47-07:08/21	06:58	07:18-07:35/17	07:31	17:24-17:45/21	07:09	07:40
	20:53		20:20	19:05-19:24/19	19:27		18:35		16:55	16:45
17	05:55	06:18-06:54/36	06:26	06:48-07:08/20	06:59	07:19-07:35/16	07:32	17:23-17:45/22	07:10	07:41
	20:52		20:18	19:04-19:25/21	19:25	07:34-07:35/1	18:33		16:54	16:46
18	05:56	06:19-06:55/36	06:27	06:49-07:07/18	07:00	07:20-07:35/15	07:33	17:23-17:46/23	07:11	07:41
	20:52		20:17	19:03-19:25/22	19:23	18:13-18:23/10	18:32		16:53	16:46
19	05:57	06:19-06:55/36	06:28	06:50-07:07/17	07:01	07:21-07:34/13 18:10-18:25/15	07:34	17:22-17:46/24	07:12	07:42
	20:51		20:15	19:02-19:26/24	19:21	07:34-07:35/1	18:30		16:53	16:46
20	05:57	06:20-06:55/35	06:29	06:51-07:17/26	07:02	07:22-07:33/11 18:08-18:26/18	07:35	17:22-17:46/24	07:14	07:43
	20:50		20:14	19:01-19:26/25	19:20	07:31-07:36/5	18:29		16:52	16:47
21	05:58	06:21-06:56/35	06:30	06:52-07:20/28	07:03	07:23-07:32/9 18:05-18:27/22	07:36	17:22-17:45/23	07:15	07:43
	20:49		20:12	19:00-19:26/26	19:18	07:30-07:36/6	18:27		16:51	16:47
22	05:59	06:22-06:57/35	06:31	06:53-07:21/28	07:04	07:24-07:30/6 18:03-18:28/25	07:38	17:23-17:45/22	07:16	07:44
	20:49		20:11	19:01-19:27/26	19:16	07:28-07:37/9	18:26		16:50	16:48
23	06:00	06:23-06:57/34	06:32	06:54-07:22/28	07:05	07:25-07:37/12 18:22-18:28/6	07:39	17:23-17:44/21	07:17	07:44
	20:48		20:09	19:01-19:27/26	19:14	18:01-18:22/21	18:24		16:50	16:48
24	06:01	06:24-06:58/34	06:33	06:55-07:23/28	07:06	07:26-07:37/11 18:23-18:28/5	07:40	17:23-17:43/20	07:18	07:45
	20:47		20:07	19:00-19:26/26	19:12	17:59-18:23/24	18:23		16:49	16:49
25	06:02	06:25-06:58/33	06:34	06:56-07:24/28	07:07	07:27-07:36/9 18:23-18:27/4	07:41	17:25-17:42/17	07:20	07:45
	20:46		20:06	19:00-19:26/26	19:11	17:58-18:23/25	18:21		16:49	16:50
26	06:03	06:26-06:58/32	06:35	06:57-07:25/28	07:08	07:29-07:37/8 18:23-18:27/4	07:43	17:26-17:40/14	07:21	07:45
	20:45		20:04	19:00-19:25/25	19:09	17:57-18:23/26	18:20		16:48	16:50
27	06:04	06:27-06:59/32	06:36	06:58-07:25/27	07:09	07:30-07:36/6 18:23-18:26/3	07:44	17:29-17:37/8	07:22	07:46
	20:44		20:03	19:01-19:24/23	19:07	17:56-18:23/27	18:18		16:48	16:51
28	06:05	06:28-06:59/31	06:37	06:59-07:25/26	07:10	07:31-07:35/4 18:23-18:26/3	07:45		07:23	07:46
	20:43		20:01	19:01-19:23/22	19:05	17:56-18:23/27	18:17		16:47	16:52
29	06:06	06:29-06:59/30	06:38	07:00-07:25/25	07:11	07:32-07:34/2 18:23-18:25/2	07:46		07:24	07:46
	20:42		19:58	19:02-19:22/20	19:04	17:54-18:23/29	18:16		16:47	16:52
30	06:07	06:30-06:59/29	06:40	07:01-07:26/25	07:13	17:52-18:22/30	07:47		07:25	07:46
	20:41		19:56	19:03-19:20/17	19:02	18:22-18:23/1	18:14		16:46	16:53
31	06:08	06:30-06:58/28	06:41	07:02-07:26/24			07:49			07:47
	20:40		19:54	19:05-19:17/12			18:13			16:54
Potential sun hours	463			375			343		294	283
Sum of minutes with flicker	1092	431	1196	799	554			0	0	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 11:06 AM / 54

Licensed user:

EDR

217 Montgomery St.

US-SYRACUSE, NY 13202

(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110**WTG:** 103 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (148)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

[January]**[February]****[March]****[April]****[May]****[June]**

1	07:47	08:16-09:05/49	09:14-10:13/59	15:38-16:09/31	07:32	08:11-08:33/22	16:27-16:52/25	06:54	07:57-08:10/13	07:01	06:14	05:43
	16:55	09:05-09:11/6	15:17-15:18/1		17:31	08:33-08:41/8		18:06		19:43	20:15	20:47
2	07:47	08:16-09:06/50	09:15-10:13/58		07:31	08:12-08:32/20	16:27-16:57/30	06:53		07:00	06:12	05:43
	16:56	09:06-09:12/6	15:38-16:09/31		17:32	08:32-08:41/9		18:08		19:44	20:16	20:47
3	07:47	08:16-09:06/50	09:16-10:14/58		07:30	08:13-08:32/19	16:27-16:59/32	06:51		06:58	06:11	05:42
	16:57	09:06-09:12/6	15:39-16:10/31		17:33	08:32-08:40/8		18:09		19:45	20:18	20:48
4	07:47	08:17-09:06/49	09:16-10:14/58		07:29	07:55-07:57/2	08:15-08:39/24	06:49		06:56	06:10	05:42
	16:58	09:06-09:13/7	15:39-16:10/31		17:34	08:01-08:09/8	16:27-17:01/34	18:10		19:46	20:19	20:49
5	07:47	08:17-09:07/50	09:17-10:14/57		07:28	07:50-08:12/22	16:26-17:01/35	06:48		06:54	06:08	05:42
	16:59	09:07-09:13/6	15:40-16:11/31		17:36	08:16-08:37/21		18:11		19:47	20:20	20:50
6	07:47	08:17-09:07/50	09:18-10:15/57		07:27	07:48-08:14/26	16:26-17:02/36	06:46		06:53	06:07	05:41
	16:59	09:07-09:14/7	15:40-16:12/32		17:37	08:23-08:35/12		18:13		19:48	20:21	20:50
7	07:47	08:18-09:08/50	09:19-10:15/56		07:25	07:47-08:16/29		06:44		06:51	06:06	05:41
	17:00	09:08-09:14/6	15:41-16:12/31		17:38	16:27-17:03/36		18:14		19:49	20:22	20:51
8	07:47	08:16-09:08/52	09:19-10:14/55		07:24	07:46-08:18/32		07:43		06:49	06:04	05:41
	17:01	09:08-09:14/6	15:41-16:12/31		17:40	16:28-17:04/36		19:15		19:51	20:23	20:52
9	07:47	08:15-09:08/53	09:20-10:15/55		07:23	07:45-08:19/34		07:41		06:48	06:03	05:40
	17:03	09:08-09:15/7	15:41-16:13/32		17:41	16:27-17:04/37		19:16		19:52	20:24	20:52
10	07:46	08:14-09:08/54	09:21-10:15/54		07:22	07:45-08:20/35		07:39		06:46	06:02	05:40
	17:04	09:08-09:15/7	15:42-16:13/31		17:42	16:28-17:04/36		19:17		19:53	20:25	20:53
11	07:46	08:14-09:09/55	09:22-10:15/53		07:20	07:44-08:21/37		07:38		06:44	06:01	05:40
	17:05	09:09-09:16/7	15:43-16:14/31		17:44	16:30-17:05/35		19:18		19:54	20:26	20:54
12	07:46	08:13-09:08/55	09:22-10:15/53		07:19	07:45-08:22/37		07:36		06:43	06:00	05:40
	17:06	09:08-09:15/7	15:43-16:14/31		17:45	16:30-17:04/34		19:20		19:55	20:27	20:54
13	07:45	08:13-09:09/56	09:23-10:15/52		07:18	07:44-08:22/38		07:34		06:41	05:59	05:40
	17:07	09:09-09:16/7	15:44-16:14/30		17:46	16:32-17:04/32		19:21		19:56	20:28	20:55
14	07:45	08:12-09:08/56	09:23-10:14/51		07:16	07:44-08:23/39		07:32		06:39	05:58	05:40
	17:08	09:08-09:16/8	15:44-16:14/30		17:48	16:35-17:04/29		19:22		19:57	20:30	20:55
15	07:45	08:11-09:09/58	09:25-10:15/50		07:15	07:44-08:23/39		07:31		06:38	05:57	05:40
	17:09	09:09-09:16/7	15:45-16:15/30		17:49	16:42-17:02/20		19:23		19:58	20:31	20:56
16	07:44	08:10-09:08/58	09:25-10:14/49		07:14	07:45-08:23/38		07:29		06:36	05:56	05:40
	17:10	09:08-09:16/8	15:45-16:14/29		17:50	16:43-17:02/19		19:24		20:00	20:32	20:56
17	07:44	08:10-09:08/58	09:27-10:14/47		07:12	07:46-08:24/38		07:27		06:34	05:55	05:40
	17:12	09:08-09:16/8	15:46-16:15/29		17:51	16:44-17:00/16		19:25		20:00	20:33	20:56
18	07:43	08:09-09:07/58	09:27-10:13/46		07:11	07:46-08:23/37		07:26		06:33	05:54	05:40
	17:13	09:07-09:16/9	15:47-16:14/27		17:53	16:46-16:58/12		19:27		20:01	20:34	20:57
19	07:43	08:08-09:06/58	09:28-10:12/44		07:09	07:47-08:23/36		07:24		06:31	05:53	05:40
	17:14	09:06-09:15/9	15:47-16:14/27		17:54	16:51-16:55/4		19:28		20:02	20:35	20:57
20	07:42	08:08-09:06/58	09:30-10:12/42		07:08	07:47-08:23/36		07:22		06:30	05:52	05:40
	17:15	09:06-09:15/9	15:49-16:14/25		17:55			19:29		20:03	20:36	20:57
21	07:41	08:08-09:05/57	09:31-10:11/40		07:07	07:47-08:23/36		07:20		06:28	05:51	05:40
	17:16	09:05-09:15/10	15:50-16:14/24		17:56			19:30		20:04	20:37	20:58
22	07:41	08:07-09:03/56	09:32-10:10/38		07:05	07:47-08:22/35		07:19		06:27	05:50	05:40
	17:18	09:03-09:14/11	15:50-16:13/23		17:58			19:31		20:05	20:38	20:58
23	07:40	08:07-09:00/53	09:33-10:08/35		07:04	07:48-08:21/33		07:17		06:25	05:49	05:41
	17:19	09:00-09:13/13	15:52-16:12/20		17:59			19:32		20:06	20:39	20:58
24	07:39	08:08-09:13/65	15:54-16:12/18		07:02	07:49-08:20/31		07:15		06:24	05:48	05:41
	17:20	09:36-10:08/32			18:00			19:34		20:07	20:40	20:58
25	07:38	08:08-09:11/63	15:56-16:10/14		07:00	07:49-08:18/29		07:13		06:22	05:48	05:41
	17:21	09:37-10:06/29	16:34-16:42/8		18:02			19:35		20:09	20:41	20:58
26	07:38	08:08-08:48/40	09:40-10:04/24	16:32-16:44/12	06:59	07:51-08:17/26		07:12		06:21	05:47	05:42
	17:23	08:52-09:10/18	15:59-16:08/9		18:03			19:36		20:10	20:41	20:59
27	07:37	08:08-08:47/39	09:43-10:01/18		06:57	07:52-08:15/23		07:10		06:19	05:46	05:42
	17:24	08:54-09:07/13	16:30-16:46/16		18:04			19:37		20:11	20:42	20:59
28	07:36	08:08-08:46/38	09:48-09:56/8		06:56	07:54-08:13/19		07:08		06:18	05:46	05:42
	17:25	09:00-09:02/2	16:29-16:48/19		18:05			19:38		20:12	20:43	20:59
29	07:35	08:09-08:45/36						07:06		06:16	05:45	05:43
	17:27	16:28-16:49/21						19:39		20:13	20:44	20:59
30	07:34	08:09-08:42/33						07:05		06:15	05:44	05:43
	17:28	16:27-16:50/23						19:40		20:14	20:45	20:59
31	07:33	08:10-08:33/23	16:27-16:51/24					07:03			05:44	
	17:29	08:33-08:42/9						19:41			20:46	
hrs	294				295			370		401	452	457
ker	3910				1476			13		0	0	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 11:06 AM / 55

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110**WTG:** 103 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (148)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117		541	386	285 8,759

Idle start wind speed: Cut in wind speed from power curve

	[July]	[August]	[September]	[October]	[November]	[December]
1	05:44 20:59 05:44 20:58	06:09 20:39 06:10 20:58	06:42 19:53 06:43 19:51	07:14 19:00 07:15 18:58	06:50 17:12 06:51 17:10	07:26 16:46 07:28 16:46
2	05:45 20:58 05:45 20:58	06:11 20:37 06:12 20:36	06:44 19:49 06:45 19:48	07:16 18:57 07:17 18:55	06:53 17:09 06:54 17:08	07:29 16:45 07:30 16:45
3	05:46 20:58 05:46 20:58	06:13 20:34 06:14 20:33	06:46 19:46 06:47 19:44	07:18 18:53 07:19 18:52	06:55 17:07 06:56 17:05	07:31 16:45 07:32 16:45
4	05:47 20:58 05:47 20:58	06:14 20:33 06:15 20:32	06:47 19:44 06:48 19:43	07:19 18:52 07:20 18:50	06:56 17:07 06:57 17:04	07:32 16:45 07:33 16:45
5	05:48 20:58 05:48 20:58	06:16 20:31 06:17 20:29	06:49 19:41 06:50 19:39	07:22 18:48 07:23 18:46	06:59 17:03 07:00 17:02	07:34 16:45 07:35 16:45
6	05:49 20:58 05:49 20:58	06:17 20:30 06:18 20:28	06:51 19:41 06:52 19:37	07:24 18:48 07:25 18:45	07:01 17:03 07:02 17:01	07:35 16:45 07:36 16:45
7	05:50 20:58 05:50 20:58	06:19 20:27 06:20 20:25	06:52 19:36 06:53 19:34	07:25 18:43 07:26 18:41	07:03 17:00 07:04 16:59	07:36 16:45 07:37 16:45
8	05:51 20:58 05:51 20:58	06:20 20:26 06:21 20:24	06:53 19:34 06:54 19:32	07:26 18:40 07:27 18:40	07:04 17:00 07:05 16:58	07:37 16:45 07:38 16:45
9	05:52 20:58 05:52 20:58	06:21 20:25 06:22 20:23	06:54 19:33 06:55 19:30	07:27 18:39 07:28 18:38	07:05 17:00 07:06 16:57	07:38 16:45 07:39 16:45
10	05:53 20:58 05:53 20:58	06:22 20:24 06:23 20:22	06:55 19:32 06:56 19:29	07:28 18:38 07:29 18:37	07:06 17:00 07:07 16:58	07:39 16:45 07:40 16:45
11	05:54 20:58 05:54 20:58	06:23 20:23 06:24 20:21	06:56 19:30 06:57 19:28	07:29 18:37 07:30 18:35	07:07 17:00 07:08 16:59	07:40 16:45 07:41 16:45
12	05:55 20:58 05:55 20:58	06:24 20:22 06:25 20:20	06:57 19:29 06:58 19:27	07:30 18:36 07:31 18:35	07:08 17:00 07:09 16:59	07:41 16:45 07:42 16:45
13	05:56 20:58 05:56 20:58	06:25 20:21 06:26 20:19	06:58 19:28 06:59 19:25	07:31 18:35 07:32 18:33	07:09 17:00 07:10 16:59	07:42 16:45 07:43 16:45
14	05:57 20:58 05:57 20:58	06:26 20:20 06:27 20:18	06:59 19:27 07:00 19:23	07:32 18:34 07:33 18:32	07:10 17:00 07:11 16:59	07:43 16:45 07:44 16:45
15	05:58 20:58 05:58 20:58	06:27 20:19 06:28 20:17	07:00 19:26 07:01 19:21	07:33 18:33 07:34 18:30	07:11 17:00 07:12 16:59	07:44 16:45 07:45 16:45
16	05:59 20:58 05:59 20:58	06:28 20:18 06:29 20:16	07:01 19:25 07:02 19:20	07:34 18:32 07:35 18:29	07:12 17:00 07:13 16:58	07:45 16:45 07:46 16:45
17	06:00 20:58 06:00 20:58	06:29 20:17 06:30 20:15	07:02 19:24 07:03 19:21	07:35 18:31 07:36 18:28	07:13 17:00 07:14 16:59	07:46 16:45 07:47 16:45
18	06:01 20:58 06:01 20:58	06:30 20:16 06:31 20:14	07:03 19:23 07:04 19:20	07:36 18:30 07:37 18:27	07:14 17:00 07:15 16:58	07:47 16:45 07:48 16:45
19	06:02 20:58 06:02 20:58	06:31 20:15 06:32 20:13	07:04 19:22 07:05 19:19	07:37 18:29 07:38 18:27	07:15 17:00 07:16 16:59	07:48 16:45 07:49 16:45
20	06:03 20:58 06:03 20:58	06:32 20:14 06:33 20:12	07:05 19:21 07:06 19:18	07:38 18:28 07:39 18:26	07:16 17:00 07:17 16:59	07:49 16:45 07:50 16:45
21	06:04 20:58 06:04 20:58	06:33 20:13 06:34 20:11	07:06 19:20 07:07 19:17	07:39 18:27 07:40 18:25	07:17 17:00 07:18 16:58	07:50 16:45 07:51 16:45
22	06:05 20:58 06:05 20:58	06:34 20:12 06:35 20:10	07:07 19:19 07:08 19:16	07:40 18:26 07:41 18:24	07:18 17:00 07:19 16:57	07:51 16:45 07:52 16:45
23	06:06 20:58 06:06 20:58	06:35 20:11 06:36 20:09	07:08 19:18 07:09 19:15	07:41 18:25 07:42 18:23	07:19 17:00 07:20 16:56	07:52 16:45 07:53 16:45
24	06:07 20:58 06:07 20:58	06:36 20:10 06:37 20:08	07:09 19:17 07:10 19:14	07:42 18:24 07:43 18:22	07:20 17:00 07:21 16:55	07:53 16:45 07:54 16:45
25	06:08 20:58 06:08 20:58	06:37 20:09 06:38 20:07	07:10 19:16 07:11 19:13	07:43 18:23 07:44 18:21	07:21 17:00 07:22 16:54	07:54 16:45 07:55 16:45
26	06:09 20:58 06:09 20:58	06:38 20:08 06:39 20:06	07:11 19:15 07:12 19:12	07:44 18:22 07:45 18:20	07:22 17:00 07:23 16:53	07:55 16:45 07:56 16:45
27	06:10 20:58 06:10 20:58	06:39 20:07 06:40 20:05	07:12 19:14 07:13 19:11	07:45 18:21 07:46 18:19	07:23 17:00 07:24 16:52	07:56 16:45 07:57 16:45
28	06:11 20:58 06:11 20:58	06:40 20:06 06:41 20:04	07:13 19:13 07:14 19:10	07:46 18:20 07:47 18:18	07:24 17:00 07:25 16:51	07:57 16:45 07:58 16:45
29	06:12 20:58 06:12 20:58	06:41 20:05 06:42 20:03	07:14 19:12 07:15 19:09	07:47 18:19 07:48 18:17	07:25 17:00 07:26 16:50	07:58 16:45 07:59 16:45
30	06:13 20:58 06:13 20:58	06:42 20:04 06:43 20:02	07:15 19:11 07:16 19:08	07:48 18:18 07:49 18:16	07:26 17:00 07:27 16:49	07:59 16:45 08:00 16:45
31	06:14 20:58 06:14 20:58	06:43 20:03 06:44 20:01	07:16 19:10 07:17 19:07	07:49 18:17 07:50 18:15	07:27 17:00 07:28 16:48	08:01 16:45 08:02 16:45
Potential sun hours	464	431	375	343	294	283
Sum of minutes with flicker	0	0	0	851	2986	4767

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

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Licensed user:

EDR

217 Montgomery St.

US-SYRACUSE, NY 13202

(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110**WTG:** 105 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (115)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

January		February		March		April		May		June	
1	07:47 14:52-15:51/59	07:32 14:55-16:17/82	16:45-16:49/4	06:54		07:01 18:11-18:53/42	06:14 19:09-19:40/31	05:43			
	16:55 15:51-16:09/18	17:31 16:19-16:45/26		18:06		19:42	20:15	20:46			
2	07:47 14:53-15:52/59	07:31 14:56-16:17/81	16:46-16:50/4	06:52		06:59 18:11-18:54/43	06:12 19:07-19:40/33	05:43			
	16:56 15:52-16:09/17	17:32 16:18-16:46/28		18:08		19:44	20:16	20:47			
3	07:47 14:53-15:54/61	07:30 14:56-16:17/81	16:47-16:51/4	06:51	17:14-17:25/11	06:58 18:09-18:55/46	06:11 19:07-19:40/33	05:42			
	16:57 15:54-16:10/16	17:33 16:18-16:47/29		18:09		19:45	20:17	20:48			
4	07:47 14:53-15:55/62	07:29 14:56-16:48/112		06:49	17:10-17:28/18	06:56 18:08-18:55/47	06:10 19:07-19:41/34	05:42			
	16:58 15:55-16:10/15	17:34 16:47-16:51/4		18:10		19:46	20:19	20:49			
5	07:47 14:53-15:57/64	07:28 14:57-16:49/112		06:48	17:08-17:29/21	06:54 18:08-18:56/48	06:08 19:07-19:41/34	05:42			
	16:59 15:57-16:11/14	17:36 16:48-16:53/5		18:11		19:47	20:20	20:50			
6	07:47 14:53-15:58/65	07:26 14:58-16:49/111		06:46	17:06-17:37/31	06:53 18:07-18:56/49	06:07 19:06-19:41/35	05:41			
	17:00 15:58-16:12/14	17:37 16:48-16:55/7		18:12		19:48	20:21	20:50			
7	07:47 14:52-15:59/67	07:25 14:59-16:50/111		06:44	17:05-17:39/34	06:51 18:06-18:56/50	06:06 19:06-19:41/35	05:41			
	17:01 15:59-16:11/12	17:38 16:49-16:56/7		18:14		19:49	20:22	20:51			
8	07:47 14:53-16:00/67	07:24 15:00-16:50/110		07:43	18:03-18:40/37	06:49 18:06-18:56/50	06:05 19:06-19:41/35	05:41			
	17:02 16:00-16:12/12	17:40 16:49-16:57/8		19:15		19:50	20:23	20:52			
9	07:46 14:53-16:02/69	07:23 15:00-16:14/74	16:49-16:58/9	07:41	18:02-18:41/39	06:48 18:05-18:56/51	06:03 19:06-19:41/35	05:40			
	17:03 16:02-16:13/11	17:41 16:16-16:50/34		19:16		19:52	20:24	20:52			
10	07:46 14:53-16:03/70	07:22 15:01-16:14/73	16:49-16:59/10	07:39	18:02-18:43/41	06:46 18:05-18:56/51	06:02 19:07-19:41/34	05:40			
	17:04 16:03-16:13/10	17:42 16:16-16:50/34		19:17		19:53	20:25	20:53			
11	07:46 14:52-16:04/72	07:20 15:03-16:13/70	16:49-16:59/10	07:38	18:01-18:43/42	06:44 18:05-18:56/51	06:01 19:07-19:41/34	05:40			
	17:05 16:04-16:13/9	17:44 16:17-16:50/33		19:18		19:54	20:26	20:53			
12	07:46 14:53-16:05/72	07:19 15:03-16:11/68	16:48-16:59/11	07:36	18:01-18:43/42	06:43 18:05-18:55/50	06:00 19:07-19:40/33	05:40			
	17:06 16:05-16:14/9	17:45 16:17-16:49/32		19:20		19:55	20:27	20:54			
13	07:45 14:53-16:07/74	07:18 15:05-16:10/65	16:48-17:00/12	07:34	18:01-18:43/42	06:41 18:04-18:55/51	05:59 19:08-19:40/32	05:40			
	17:07 16:07-16:14/7	17:46 16:17-16:49/32		19:21		19:56	20:28	20:54			
14	07:45 14:53-16:07/74	07:16 15:07-16:09/62	16:48-17:00/12	07:32	18:01-18:43/42	06:39 18:05-18:55/50	05:58 19:08-19:40/32	05:40			
	17:08 16:07-16:14/7	17:48 16:19-16:49/30		19:22		19:57	20:29	20:55			
15	07:45 14:53-16:09/76	07:15 15:08-16:06/58	16:47-16:59/12	07:31	18:00-18:42/42	06:38 18:05-18:54/49	05:57 19:08-19:39/31	05:40			
	17:09 16:09-16:15/6	17:49 16:19-16:48/29		19:23		19:58	20:30	20:55			
16	07:44 14:53-16:09/76	07:14 15:10-16:04/54	16:46-16:59/13	07:29	18:00-18:42/42	06:36 18:04-18:53/49	05:56 19:09-19:39/30	05:40			
	17:10 16:09-16:15/6	17:50 16:20-16:47/27		19:24		19:59	20:31	20:56			
17	07:44 14:52-16:10/78	07:12 15:12-15:45/33	16:21-16:45/24	07:27	18:02-18:42/40	06:34 18:05-18:53/48	05:55 19:10-19:38/28	05:40			
	17:12 16:10-16:14/4	17:51 15:52-15:58/6	16:44-16:58/14	19:25	18:42-18:43/1	20:01	20:33	20:56			
18	07:43 14:53-16:11/78	07:11 15:15-15:44/29	16:43-16:58/15	07:26	18:02-18:41/39	06:33 18:05-18:51/46	05:54 19:10-19:37/27	05:40			
	17:13 16:11-16:15/4	17:53 16:23-16:43/20		19:27	18:41-18:43/2	20:01	20:34	20:57			
19	07:42 14:52-16:12/80	07:09 15:17-15:40/23	16:40-16:57/17	07:24	18:03-18:39/36	06:31 18:06-18:51/45	05:53 19:11-19:36/25	05:40			
	17:14 16:12-16:14/2	17:54 16:25-16:40/15		19:28	18:39-18:42/3	20:02	20:35	20:57			
20	07:42 14:52-16:12/80	07:08 15:22-15:36/14	16:36-16:56/20	07:22	18:04-18:37/33	06:30 18:07-18:50/43	05:52 19:12-19:35/23	05:40			
	17:15 16:12-16:13/1	17:55 16:30-16:36/6		19:29	18:37-18:42/5	20:03	20:36	20:57			
21	07:41 14:53-16:13/80	07:06 16:36-16:54/18		07:20	18:06-18:35/29	06:28 18:08-18:49/41	05:51 19:13-19:34/21	05:40			
	17:16	17:56		19:30	18:35-18:42/7	20:04	20:37	20:58			
22	07:41 14:53-16:13/80	07:05 16:39-16:52/13		07:19	18:08-18:41/33	06:27 18:08-18:47/39	05:50 19:15-19:34/19	05:40			
	17:18	17:58		19:31		20:05	20:38	20:58			
23	07:40 14:53-16:13/80	07:03 16:42-16:48/6		07:17	18:12-18:40/28	06:25 18:10-18:46/36	05:49 19:16-19:33/17	05:41			
	17:19	17:59		19:32		20:06	20:38	20:58			
24	07:39 14:53-16:14/81	07:02		07:15	18:12-18:39/27	06:24 18:10-18:44/34	05:48 19:17-19:31/14	05:41			
	17:20	18:00		19:33		20:07 19:21-19:29/8	20:39	20:58			
25	07:38 14:54-16:15/81	07:00		07:13	18:13-18:38/25	06:22 18:12-18:43/31	05:48 19:19-19:28/9	05:41			
	17:22	18:01		19:35		20:08 19:17-19:33/16	20:40	20:58			
26	07:37 14:54-16:16/82	06:59		07:12	18:14-18:43/29	06:21 18:13-18:41/28	05:47	05:42			
	17:23	18:03		19:36		20:10 19:14-19:34/20	20:41	20:58			
27	07:37 14:54-16:16/82	06:57		07:10	18:16-18:46/30	06:19 18:16-18:39/23	05:46	05:42			
	17:24 16:26-16:34/8	18:04		19:37		20:11 19:13-19:36/23	20:42	20:58			
28	07:36 14:54-16:16/82	16:38-16:39/1		07:08	18:18-18:48/30	06:18 18:19-18:36/17	05:46	05:42			
	17:25 16:23-16:38/15	18:05		19:38		20:12 19:12-19:38/26	20:43	20:58			
29	07:35 14:54-16:17/83	16:41-16:44/3		07:06	18:17-18:50/33	06:16 18:23-18:31/8	05:45	05:43			
	17:27 16:22-16:41/19			19:39		20:13 19:10-19:38/28	20:44	20:58			
30	07:34 14:54-16:17/83	16:42-16:46/4		07:05	18:15-18:51/36	06:15 19:09-19:39/30	05:44	05:43			
	17:28 16:20-16:42/22			19:40		20:14	20:45	20:58			
31	07:33 14:55-16:17/82	16:44-16:48/4		07:03	18:13-18:52/39		05:44				
	17:29 16:19-16:44/25			19:41			20:46				
Potential sun hours		294		295		370		401		457	
Sum of minutes with flicker		2594		2049		989		1367		714	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

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Licensed user:

EDR

217 Montgomery St.

US-SYRACUSE, NY 13202

(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110**WTG:** 105 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (115)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	05:44 20:58	06:09 19:17-19:50/33 20:39	06:42 18:04-18:55/51 19:53	07:14 17:40-18:22/42 19:00	06:50 14:31-15:44/73 17:12 15:46-16:20/34	07:26 14:34-15:46/72 16:46 15:46-15:55/9
2	05:44 20:58	06:10 19:16-19:50/34 20:38	06:43 18:04-18:55/51 19:51	07:15 17:40-18:22/42 18:58	06:51 14:30-15:44/74 17:10 15:46-16:20/34	07:27 14:35-15:45/70 16:46 15:45-15:56/11
3	05:45 20:58	06:11 19:16-19:51/35 20:37	06:44 18:03-18:54/51 19:49	07:16 17:40-18:21/41 18:57	06:52 14:28-16:19/111 17:09 16:18-16:26/8	07:28 14:37-15:46/69 16:45 15:46-15:57/11
4	05:45 20:58	06:12 19:16-19:51/35 20:35	06:45 18:03-18:53/50 19:48	07:17 17:40-18:19/39 18:55	06:54 14:28-16:20/112 17:08 16:19-16:26/7	07:29 14:38-15:45/67 16:45 15:45-15:57/12
5	05:46 20:58	06:13 19:16-19:51/35 20:34	06:46 18:03-18:53/50 19:46	07:18 17:40-18:18/38 18:53	06:55 14:27-16:19/112 17:07 16:18-16:24/6	07:30 14:38-15:45/67 16:45 15:45-15:57/12
6	05:47 20:57	06:14 19:16-19:50/34 20:33	06:47 18:03-18:52/49 19:44	07:19 17:40-18:16/36 18:52	06:56 14:27-16:18/111 17:05 16:17-16:22/5	07:31 14:39-15:44/65 16:45 15:44-15:58/14
7	05:47 20:57	06:15 19:16-19:50/34 20:32	06:48 18:03-18:51/48 19:42	07:20 17:42-18:14/32 18:50	06:57 14:27-16:19/112 17:04 16:18-16:22/4	07:32 14:40-15:44/64 16:45 15:44-15:58/14
8	05:48 20:57	06:16 19:16-19:50/34 20:31	06:49 18:03-18:50/47 19:41	07:21 17:42-18:09/27 18:48	06:59 14:26-16:17/111 17:03 16:17-16:21/4	07:33 14:41-15:43/62 16:45 15:43-15:58/15
9	05:49 20:56	06:17 19:16-19:49/33 20:29	06:50 18:03-18:49/46 19:39	07:23 17:44-18:03/19 18:46	07:00 14:26-15:47/81 17:02 15:48-16:16/28	07:34 14:41-15:42/61 16:45 15:42-15:58/16
10	05:49 20:56	06:18 19:16-19:49/33 20:28	06:51 18:04-18:48/44 19:37	07:24 17:46-18:01/15 18:45	07:01 14:26-15:48/82 17:01 15:50-16:16/26	07:35 14:42-15:41/59 16:45 15:41-15:58/17
11	05:50 20:56	06:19 19:16-19:48/32 20:27	06:52 18:04-18:46/42 19:35	07:25 17:50-17:56/6 18:43	07:02 14:26-15:48/82 17:00 15:50-16:14/24	07:36 14:42-15:41/59 16:45 15:41-15:59/18
12	05:51 20:55	06:20 19:17-19:48/31 20:25	06:53 18:05-18:45/40 19:34	07:26 17:50-17:56/6 18:41	07:04 14:25-15:48/83 16:59 15:51-16:13/22	07:37 14:43-15:40/57 16:45 15:40-15:59/19
13	05:52 20:55	06:22 19:17-19:47/30 20:24	06:54 18:06-18:43/37 19:32	07:27 17:50-17:56/6 18:40	07:05 14:26-15:48/82 16:58 15:54-16:12/18	07:38 14:44-15:28/44 16:45 15:29-15:39/10
14	05:52 20:54	06:23 18:29-18:40/11 20:22	06:55 18:07-18:41/34 19:30	07:28 17:50-17:56/6 18:38	07:06 14:26-15:48/82 16:57 15:55-16:10/15	07:39 14:45-15:28/43 16:45 15:37-16:00/23
15	05:53 20:54	06:24 18:25-18:44/19 20:21	06:56 18:09-18:38/29 19:28	07:29 17:50-17:56/6 18:37	07:07 14:26-15:48/82 16:56 15:58-16:06/8	07:39 14:45-15:28/43 16:45 15:37-16:00/23
16	05:54 20:53	06:25 18:22-18:46/24 20:20	06:58 18:05-18:36/31 19:27	07:31 17:50-17:56/6 18:35	07:09 14:27-15:49/82 16:55	07:40 14:46-15:28/42 16:46 15:38-16:00/22
17	05:55 20:52	06:26 18:20-18:48/28 20:18	06:59 18:03-18:32/29 19:25	07:32 17:50-17:56/6 18:33	07:10 14:27-15:48/81 16:54	07:41 14:47-15:29/42 16:46 15:39-16:01/22
18	05:56 19:31-19:37/6 20:52	06:27 18:18-18:49/31 20:17	07:00 18:01-18:25/24 19:23	07:33 17:50-17:56/6 18:32	07:11 14:27-15:48/81 16:53	07:41 14:47-15:29/42 16:46 15:39-16:01/22
19	05:57 19:28-19:39/11 20:51	06:28 18:16-18:50/34 20:15	07:01 18:00-18:26/26 19:21	07:34 17:12-17:21/9 18:30	07:12 14:28-15:48/80 16:53	07:42 14:48-15:29/41 16:47 15:39-16:02/23
20	05:57 19:26-19:41/15 20:50	06:29 18:15-18:52/37 20:14	07:02 17:58-18:26/28 19:20	07:35 17:09-17:24/15 18:29	07:14 14:28-15:48/80 16:52	07:42 14:48-15:29/41 16:47 15:39-16:02/23
21	05:58 19:25-19:43/18 20:49	06:30 18:14-18:53/39 20:12	07:03 17:55-18:26/31 19:18	07:36 17:06-17:25/19 18:27	07:15 14:28-15:48/80 16:51	07:43 14:49-15:30/41 16:47 15:40-16:03/23
22	05:59 19:24-19:44/20 20:49	06:31 18:12-18:54/42 20:11	07:04 17:51-18:19/28 19:16	07:38 15:51-16:08/17 18:26	07:16 14:29-15:49/80 16:50	07:44 14:49-15:30/41 16:48 15:40-16:02/22
23	06:00 19:23-19:45/22 20:48	06:32 18:11-18:54/43 20:09	07:05 17:48-18:21/33 19:14	07:39 15:47-16:12/25 18:24	07:17 14:29-15:49/80 16:50	07:44 14:50-15:31/41 16:48 15:41-16:04/23
24	06:01 19:22-19:46/24 20:47	06:33 18:10-18:55/45 20:07	07:06 17:46-18:22/36 19:12	07:40 15:43-16:14/31 18:23	07:18 14:30-15:48/78 16:49	07:45 14:50-15:31/41 16:49 15:41-16:04/23
25	06:02 19:21-19:47/26 20:46	06:34 18:09-18:55/46 20:06	07:07 17:45-18:23/38 19:11	07:41 15:42-16:16/34 18:21	07:20 14:30-15:48/78 16:49	07:45 14:51-15:32/41 16:50 15:42-16:05/23
26	06:03 19:21-19:48/27 20:45	06:35 18:08-18:55/47 20:04	07:08 17:43-18:24/41 19:09	07:42 15:39-16:34/55 18:20	07:21 14:32-15:47/75 16:48	07:45 14:51-15:33/42 16:50 15:43-16:05/22
27	06:04 19:20-19:49/29 20:44	06:36 18:07-18:56/49 20:03	07:09 17:42-18:24/42 19:07	07:44 15:37-16:37/60 18:18	07:22 14:32-15:48/76 16:48	07:46 14:51-15:33/42 16:51 15:43-16:05/22
28	06:05 19:19-19:50/31 20:43	06:37 18:06-18:56/50 20:01	07:10 17:42-18:24/42 19:05	07:45 15:35-16:38/63 18:17	07:23 14:33-15:47/74 16:47	07:46 14:51-15:34/43 16:52 15:43-16:06/23
29	06:06 19:18-19:49/31 20:42	06:38 18:06-18:56/50 19:58	07:11 17:41-18:23/42 19:04	07:46 15:34-16:40/66 18:16	07:24 14:33-15:47/74 16:47	07:46 14:52-15:35/43 16:52 15:39-15:43/4
30	06:07 19:17-19:50/33 20:41	06:40 18:05-18:55/50 19:56	07:13 17:41-18:23/42 19:02	07:47 15:33-16:41/68 18:14	07:25 14:34-15:46/72 16:46	07:46 14:52-15:36/44 16:53 15:38-15:47/9
31	06:08 19:17-19:50/33 20:40	06:41 18:04-18:55/51 19:54	07:14 17:41-18:23/42 18:13	07:49 15:31-16:42/71 18:13	07:26 14:34-15:46/72 16:46	07:47 14:52-15:36/44 16:54 15:49-16:08/19
Potential sun hours	463	431	375	343	294	283
Sum of minutes with flicker	326	1243	1201	1263	2881	2205

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

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Licensed user:

EDR

217 Montgomery St.

US-SYRACUSE, NY 13202

(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110**WTG:** 110 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (147)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117		541	386	285 8,759

Idle start wind speed: Cut in wind speed from power curve

[January]**[February]****[March]****[April]****[May]****[June]**

1	07:47	08:59-09:42/43	13:55-14:10/15	16:10-16:28/18	07:32	08:17-09:47/90	16:45-17:06/21	06:54	07:34-07:58/24	07:01	07:44-08:19/35	06:14	05:43
	16:55	10:32-11:28/56	15:07-15:18/11		17:31	16:18-16:47/29		18:07	07:58-08:00/2	19:43		20:15	20:47
2	07:47	08:59-09:42/43	13:58-14:08/10	16:10-16:29/19	07:31	08:17-09:47/90	16:44-17:07/23	06:53	07:33-07:59/26	07:00	07:43-08:19/36	06:12	05:43
	16:56	10:33-11:28/55	15:09-15:17/8		17:32	16:19-16:46/27		18:08		19:44		20:17	20:48
3	07:47	08:58-09:43/45	16:10-16:30/20		07:30	08:17-09:47/90	16:43-17:09/26	06:51	07:32-07:59/27	06:58	07:41-08:19/38	06:11	05:42
	16:57	10:33-11:28/55			17:33	16:21-16:44/23		18:09		19:45		20:18	20:48
4	07:47	08:57-09:44/47	16:10-16:31/21		07:29	08:17-09:48/91	16:41-17:10/29	06:49	07:31-07:59/28	06:56	07:41-08:21/40	06:10	05:42
	16:58	10:34-11:28/54			17:35	16:23-16:41/18		18:10		19:46		20:19	20:49
5	07:47	08:57-09:44/47	16:10-16:32/22		07:28	08:17-09:48/91	16:38-17:11/33	06:48	07:31-08:00/29	06:54	07:39-08:21/42	06:08	05:42
	16:59	10:35-11:28/53			17:36	16:25-16:38/13		18:11		19:47		20:20	20:50
6	07:47	08:56-09:45/49	16:10-16:33/23		07:27	08:16-09:12/56	16:35-17:13/38	06:46	07:30-07:59/29	06:53	07:38-08:20/42	06:07	05:41
	17:00	10:36-11:28/52			17:37	09:12-09:47/35		18:13		19:48		20:21	20:51
7	07:47	08:56-09:45/49	16:10-16:34/24		07:26	08:16-09:12/56	16:36-17:14/38	06:44	07:30-07:59/29	06:51	07:37-08:20/43	06:06	05:41
	17:01	10:38-11:28/50			17:39	09:12-09:47/35		18:14		19:49		20:22	20:51
8	07:47	08:55-09:46/51	16:10-16:35/25		07:24	08:17-09:11/54	16:38-17:16/38	07:43	08:29-08:58/29	06:49	07:37-08:21/44	06:05	05:41
	17:02	10:39-11:28/49			17:40	09:11-09:47/36		19:15		19:51		20:23	20:52
9	07:47	08:54-09:46/52	16:10-16:36/26		07:23	08:18-09:11/53	16:40-17:18/38	07:41	08:21-08:25/4	06:48	07:37-08:20/43	06:03	05:41
	17:03	10:39-11:27/48			17:41	09:11-09:47/36		19:16	08:30-08:58/28	19:52		20:24	20:52
10	07:47	08:53-09:47/54	16:10-16:37/27		07:22	08:17-09:09/52	16:42-17:18/36	07:39	08:16-08:29/13	06:46	07:36-08:19/43	06:02	05:40
	17:04	10:41-11:27/46			17:42	09:09-09:46/37		19:17	08:08-08:57/27	19:53		20:25	20:53
11	07:46	08:53-09:47/54	16:10-16:39/29		07:21	08:18-09:08/50	16:44-17:20/36	07:38	08:13-08:56/43	06:44	07:36-08:20/44	06:01	05:40
	17:05	10:42-11:26/44			17:44	09:08-09:46/38		19:19		19:54		20:26	20:54
12	07:46	08:46-08:49/3	10:43-11:25/42		07:19	08:19-09:07/48	16:45-17:22/37	07:36	08:12-08:55/43	06:43	07:36-08:19/43	06:00	05:40
	17:06	08:52-09:47/55	16:10-16:39/29		17:45	09:07-09:46/39		19:20		19:55		20:28	20:54
13	07:46	08:43-09:48/65	16:10-16:41/31		07:18	08:20-08:44/24	09:04-09:45/41	07:34	08:11-08:53/42	06:41	07:35-08:18/43	05:59	05:40
	17:07	10:45-11:24/39			17:46	08:45-09:04/19	16:45-17:23/38	19:21		19:56		20:29	20:55
14	07:45	08:41-09:47/66	16:09-16:41/32		07:17	08:21-08:43/22	09:01-09:45/44	07:33	08:09-08:33/24	06:39	07:36-08:18/42	05:58	05:40
	17:08	10:46-11:22/36			17:48	08:48-09:01/13	16:46-17:24/39	19:22	08:34-08:51/17	19:57		20:30	20:55
15	07:45	08:41-09:48/67	16:10-16:43/33		07:15	08:23-08:41/18	16:46-17:25/38	07:31	08:08-08:33/25	06:38	07:36-08:16/40	05:57	05:40
	17:09	10:49-11:22/33			17:49	08:49-09:43/54		19:23	08:35-08:48/13	19:59		20:31	20:56
16	07:44	08:39-09:48/69	16:10-16:44/34		07:14	08:25-08:38/13	16:48-17:27/39	07:29	08:08-08:34/26	06:36	07:37-08:16/39	05:56	05:40
	17:10	10:50-11:19/29			17:50	08:50-09:43/53		19:24		20:00		20:32	20:56
17	07:44	08:39-09:49/70	16:10-16:45/35		07:12	08:31-08:34/3	16:50-17:28/38	07:27	08:08-08:34/26	06:35	07:37-08:15/38	05:55	05:40
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18	07:43	08:38-09:48/70	16:10-16:45/35		07:11	08:51-09:40/49		07:26	08:07-08:33/26	06:33	07:38-08:14/36	05:54	05:40
	17:13	10:57-11:14/17	16:45-16:47/2		17:53	16:51-17:27/36		19:27		20:01		20:34	20:57
19	07:43	08:38-09:49/71	16:10-16:45/35		07:10	07:48-07:52/4	16:54-17:27/33	07:24	08:07-08:32/25	06:31	07:38-08:12/34	05:53	05:40
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21	07:41	08:36-09:48/72	16:46-16:51/5		07:07	07:42-07:58/16	16:59-17:25/26	07:20	08:08-08:31/23	06:28	07:40-08:09/29	05:51	05:40
	17:17	16:11-16:46/35			17:57	08:55-09:36/41		19:30		20:04		20:37	20:58
22	07:41	08:36-09:48/72	16:46-16:52/6		07:05	07:40-07:59/19	17:01-17:23/22	07:19	08:08-08:29/21	06:27	07:41-08:07/26	05:50	05:41
	17:18	16:11-16:46/35			17:58	08:56-09:34/38		19:31		20:05		20:38	20:58
23	07:40	08:36-09:48/72	16:47-16:54/7		07:04	07:39-08:00/21	17:04-17:20/16	07:17	08:09-08:27/18	06:25	07:43-08:05/22	05:49	05:41
	17:19	16:12-16:48/36			17:59	08:58-09:32/34		19:32		20:06		20:39	20:58
24	07:39	08:25-08:35/10	16:12-16:48/36		07:02	07:38-08:01/23		07:15	08:11-08:26/15	06:24	07:46-08:03/17	05:49	05:41
	17:20	08:36-09:48/72	16:47-16:55/8		18:00	09:00-09:29/29		19:34		20:08		20:40	20:58
25	07:39	08:23-09:47/84	16:47-16:56/9		07:01	07:38-08:02/24		07:13	08:14-08:22/8	06:22	07:50-07:57/7	05:48	05:41
	17:22	16:13-16:48/35			18:02	09:03-09:26/23		19:35		20:09		20:41	20:59
26	07:38	08:21-09:46/85	16:47-16:58/11		06:59	07:37-08:01/24		07:12		06:21		05:47	05:42
	17:23	16:13-16:48/35			18:03	09:07-09:20/13		19:36		20:10		20:42	20:59
27	07:37	08:20-09:45/85	16:47-16:59/12		06:57	07:36-07:55/19		07:10	07:58-08:07/9	06:19		05:46	05:42
	17:24	16:13-16:48/35			18:04	07:55-08:01/6		19:37		20:11		20:42	20:59
28	07:36	08:19-09:45/86	16:47-17:00/13		06:56	07:36-07:57/21		07:08	07:54-08:12/18	06:18		05:46	05:42
	17:25	16:14-16:48/34			18:05	07:57-08:01/4		19:38		20:12		20:43	20:59
29	07:35	08:18-09:45/87	16:46-17:02/16					07:07	07:50-08:14/24	06:16		05:45	05:43
	17:27	16:15-16:47/32						19:39		20:13		20:44	20:59
30	07:34	08:18-09:46/88	16:46-17:03/17					07:05	07:48-08:16/28	06:15		05:44	05:43
	17:28	16:16-16:47/31						19:40		20:14		20:45	20:59
31	07:33	08:17-09:46/89	16:46-17:04/18					07:03	07:45-08:17/32			05:44	
	17:29	16:17-16:48/31						19:42				20:46	
rs	294				295			370		401		452	457
ker	3924				2795			825		897		0	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

Printed/Page

8/31/2015 11:06 AM / 59

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110**WTG:** 110 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (147)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	05:44 20:59 20:59	06:09 20:39 06:10 20:38	06:42 07:35-08:19/44 19:53 06:43 07:35-08:18/43 19:51	07:14 07:50-08:33/43 19:00 07:15 07:51-08:34/43 18:59	06:50 07:47-08:39/52 16:12-16:48/36 17:12 08:39-09:16/37 06:51 07:46-08:40/54 16:09-16:46/37 17:10 08:40-09:16/36	07:27 08:35-09:29/54 15:52-16:21/29 16:46 10:25-11:08/43 07:28 08:36-09:30/54 15:53-16:20/27 16:46 10:24-11:09/45
2	05:45 20:58 20:57	06:11 20:37 06:12 20:36	06:44 07:35-08:18/43 19:50 06:45 07:34-08:18/44 19:48	07:16 07:53-08:34/41 18:57 07:17 07:55-08:04/9 18:55 08:07-08:35/28	06:53 07:47-08:41/54 16:07-16:46/39 17:09 08:41-09:17/36 06:54 07:46-08:42/56 16:06-16:44/38 17:08 08:42-09:17/35	07:29 08:38-09:30/52 15:54-16:20/26 16:45 10:23-11:11/48 07:30 08:39-09:30/51 15:54-16:19/25 16:45 10:23-11:12/49
3	05:45 20:58 20:57	06:11 20:37 06:12 20:36	06:44 07:35-08:18/43 19:50 06:45 07:34-08:18/44 19:48	07:16 07:53-08:34/41 18:57 07:17 07:55-08:04/9 18:55 08:07-08:35/28	06:53 07:47-08:41/54 16:07-16:46/39 17:09 08:41-09:17/36 06:54 07:46-08:42/56 16:06-16:44/38 17:08 08:42-09:17/35	07:29 08:38-09:30/52 15:54-16:20/26 16:45 10:23-11:11/48 07:30 08:39-09:30/51 15:54-16:19/25 16:45 10:23-11:12/49
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5	05:46 20:58 20:57	06:13 20:35 06:14 20:33	06:46 07:34-08:17/43 19:46 06:47 07:34-08:16/42 19:44	07:18 08:07-08:36/29 18:53 07:19 08:07-08:35/28 18:52	06:55 07:46-09:17/91 16:04-16:42/38 17:07 16:00-16:03/3 06:56 07:47-09:18/91 16:09-16:42/33 17:06 15:55-16:09/14	07:31 08:40-09:31/51 15:55-16:19/24 16:45 10:23-11:13/50 07:32 08:42-09:31/49 15:56-16:19/23 16:45 10:23-11:14/51
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17	05:55 20:53 20:53	06:26 20:18 06:27 07:55-08:05/10 20:17	06:59 19:25 07:00 08:02-08:08/6 19:23	07:32 08:09-08:33/24 18:34 09:33-09:59/26 07:33 08:10-08:32/22 18:32 09:30-10:01/31	07:11 07:59-08:09/10 15:46-16:22/36 16:53 08:10-09:22/72 16:21-16:28/7 07:13 08:10-09:22/72 16:21-16:28/7 16:53 15:46-16:22/36	16:46 10:24-11:23/59 14:56-15:16/20 07:42 08:53-09:36/43 13:44-14:09/25 16:07-16:20/13 16:46 10:25-11:24/59 14:56-15:17/21 07:42 08:53-09:36/43 13:44-14:10/27 16:07-16:20/13 16:47 10:24-11:24/60 14:56-15:17/21
18	05:56 20:52 20:52	06:27 07:55-08:05/10 20:17 06:28 07:51-08:09/18 20:15	07:00 08:02-08:08/6 19:23 07:01 07:58-08:11/13 19:21	07:33 08:10-08:32/22 18:32 09:30-10:01/31 07:34 08:10-08:31/21 17:33-17:52/19 18:30 09:28-10:03/35	07:13 08:10-09:22/72 16:21-16:28/7 16:53 15:46-16:22/36 07:14 08:11-09:23/72 16:21-16:27/6 16:52 15:46-16:21/35	16:47 10:24-11:24/60 14:56-15:17/21 07:42 08:53-09:36/43 13:44-14:10/27 16:07-16:20/13 16:47 10:24-11:24/60 14:56-15:17/21 07:43 08:54-09:36/42 13:44-14:11/27 16:08-16:20/12 16:47 10:25-11:25/60 14:57-15:18/21
19	05:57 20:51 20:50	06:28 07:49-08:11/22 20:14 06:29 07:47-08:13/26 20:12	07:01 07:58-08:11/13 19:21 07:02 07:56-08:13/17 19:20	07:35 08:11-08:29/18 17:30-17:54/24 18:29 09:26-10:05/39 07:37 08:13-08:28/15 17:29-17:56/27 18:27 09:25-10:07/42	07:14 08:11-09:23/72 16:21-16:27/6 16:52 15:46-16:21/35 07:15 08:12-09:24/72 16:22-16:27/5 16:51 15:47-16:22/35	16:47 10:25-11:25/60 14:57-15:18/21 07:43 08:54-09:36/42 13:44-14:11/27 16:08-16:20/12 16:47 10:25-11:25/60 14:57-15:18/21 07:44 08:55-09:37/42 13:45-14:12/27 16:09-16:21/12 16:48 10:26-11:26/60 14:58-15:19/21
20	05:58 20:50 20:50	06:30 07:47-08:13/26 20:12 06:31 07:45-08:14/29 20:11	07:02 07:56-08:13/17 19:20 07:03 07:54-08:14/20 19:18	07:37 08:13-08:28/15 17:29-17:56/27 18:27 09:25-10:07/42 07:38 08:15-08:25/10 17:27-17:57/30 18:26 09:23-10:08/45	07:15 08:12-09:24/72 16:22-16:27/5 16:51 15:47-16:22/35 07:16 08:13-09:25/72 16:22-16:26/4 16:51 15:47-16:22/35	16:48 10:26-11:26/60 14:58-15:19/21 07:44 08:55-09:37/42 13:45-14:12/27 16:09-16:21/12 16:48 10:26-11:26/60 14:58-15:19/21 07:45 08:56-09:38/42 13:46-14:13/27 16:10-16:23/13 16:49 10:27-11:27/60 14:59-15:20/21
21	05:59 20:49 20:49	06:31 07:45-08:14/29 20:11 06:32 07:43-08:15/32 20:09	07:03 07:54-08:14/20 19:18 07:04 07:52-08:15/23 19:16	07:38 08:15-08:25/10 17:27-17:57/30 18:26 09:23-10:08/45 07:39 09:22-10:09/47 18:24 17:23-17:57/34	07:16 08:13-09:25/72 16:22-16:26/4 16:51 15:47-16:22/35 07:17 08:14-09:25/71 16:22-16:25/3 16:50 15:47-16:22/35	16:49 10:27-11:27/60 14:59-15:20/21 07:45 08:56-09:38/42 13:46-14:13/27 16:10-16:23/13 16:49 10:27-11:27/60 14:59-15:20/21 07:45 08:56-09:39/43 13:46-14:13/27

Project:

2015-08-31_Arkwright Summit_SFA

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Licensed user:

EDR217 Montgomery St.
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Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110WTG: 111 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (152)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

January			February			March			April			May			June		
1	07:47	08:36-09:17/41 15:47-16:13/26	07:32	16:06-16:37/31	06:54	07:01	19:04-19:21/17	06:14	19:19-19:46/27	05:43	19:57-20:22/25						
	16:55	15:30-15:40/10	17:31		18:07		19:43		20:15	19:46-19:53/7	20:47						
2	07:47	08:37-09:17/40 15:47-16:14/27	07:31	16:07-16:36/29	06:53		07:00	19:03-19:22/19	06:12	19:19-19:45/26	20:47						
	16:56	15:31-15:39/8	17:32		18:08		19:44		20:16	19:45-19:53/8	20:47						
3	07:47	08:37-09:17/40 15:48-16:14/26	07:30	16:08-16:36/28	06:51		06:58	19:02-19:23/21	06:11	19:20-19:44/24	05:42	19:58-20:23/25					
	16:57	15:34-15:38/4	17:33		18:09		19:45		20:18	19:44-19:55/11	20:48						
4	07:47	08:37-09:17/40	07:29	16:09-16:35/26	06:49		06:56	19:01-19:24/23	06:10	19:22-19:43/21	05:42	19:58-20:23/25					
	16:58	15:48-16:15/27	17:35		18:10		19:46		20:19	19:43-19:55/12	20:49						
5	07:47	08:38-09:17/39	07:28	16:09-16:34/25	06:48		06:54	19:01-19:25/24	06:08	19:23-19:41/18	05:42	19:58-20:24/26					
	16:59	15:49-16:15/26	17:36		18:11		19:47		20:20	19:41-19:55/14	20:50						
6	07:47	08:38-09:17/39	07:27	16:11-16:33/22	06:46		06:53	19:01-19:26/25	06:07	19:24-19:38/14	05:41	19:59-20:25/26					
	17:00	15:49-16:16/27	17:37		18:13		19:48		20:21	19:38-19:53/15	20:50						
7	07:47	08:38-09:16/38	07:25	16:13-16:32/19	06:44		06:51	19:00-19:27/27	06:06	19:28-19:35/7	05:41	19:58-20:25/27					
	17:01	15:50-16:17/27	17:38		18:14		19:49		20:22	19:35-19:53/18	20:51						
8	07:47	08:39-09:16/37	07:24	16:15-16:30/15	07:43		06:49	19:01-19:27/26	06:05	19:34-19:52/18	05:41	19:59-20:26/27					
	17:02	15:50-16:16/26	17:40		19:15		19:51	19:27-19:29/2	20:23		20:52						
9	07:47	08:39-09:05/26 15:50-16:19/29	07:23	16:18-16:26/8	07:41		06:48	19:01-19:26/25	06:03	19:35-19:50/15	05:40	19:59-20:26/27					
	17:03	09:06-09:14/8	17:41		19:16		19:52	19:26-19:29/3	20:24		20:52						
10	07:46	08:39-09:06/27	07:22		07:39		06:46	19:01-19:24/23	06:02	19:37-19:49/12	05:40	20:00-20:27/27					
	17:04	15:51-16:21/30	17:42		19:17		19:53	19:24-19:30/6	20:25	20:01-20:02/1	20:53						
11	07:46	08:40-09:06/26	07:21		07:38		06:44	19:03-19:23/20	06:01	19:40-19:45/5	05:40	20:00-20:27/27					
	17:05	15:52-16:23/31	17:44		19:19		19:54	19:23-19:32/9	20:26	20:00-20:03/3	20:54						
12	07:46	08:40-09:06/26	07:19		07:36		06:43	19:04-19:21/17	06:00	19:58-20:04/6	05:40	20:01-20:27/26					
	17:06	15:52-16:24/32	17:45		19:20		19:55	19:21-19:33/12	20:27		20:54						
13	07:46	08:41-09:07/26	07:18		07:34		06:41	19:06-19:18/12	05:59	19:57-20:05/8	05:40	20:01-20:27/26					
	17:07	15:53-16:26/33	17:46		19:21		19:56	19:18-19:33/15	20:29		20:55						
14	07:45	08:40-09:07/27	07:17		07:33		06:39	19:12-19:35/23	05:58	19:56-20:06/10	05:40	20:02-20:27/25					
	17:08	15:53-16:27/34	17:48		19:22		19:57		20:30		20:55						
15	07:45	08:41-09:07/26	07:15		07:31		06:38	19:12-19:34/22	05:57	19:56-20:07/11	05:40	20:02-20:27/25					
	17:09	15:54-16:29/35	17:49		19:23		19:58	19:34-19:36/2	20:31		20:56						
16	07:44	08:41-09:07/26	07:14		07:29		06:36	19:13-19:34/21	05:56	19:55-20:08/13	05:40	20:02-20:27/25					
	17:10	15:54-16:29/35	17:50		19:24		20:00	19:34-19:37/3	20:32		20:56						
17	07:44	08:43-09:08/25	07:12		07:27		06:35	19:14-19:32/18	05:55	19:54-20:09/15	05:40	20:02-20:28/26					
	17:12	15:56-16:31/35	17:51		19:26		20:00	19:32-19:38/6	20:33		20:56						
18	07:43	08:43-09:07/24	07:11		07:26		06:33	19:15-19:30/15	05:54	19:54-20:10/16	05:40	20:02-20:28/26					
	17:13	15:56-16:31/35	17:53		19:27		20:01	19:30-19:39/9	20:34		20:57						
19	07:43	08:43-09:07/24	07:10		07:24		06:31	19:17-19:27/10	05:53	19:54-20:11/17	05:40	20:03-20:28/25					
	17:14	15:57-16:32/35	17:54		19:28		20:02	19:27-19:40/13	20:35		20:57						
20	07:42	08:45-09:07/22	07:08		07:22		06:30	19:19-19:41/22	05:52	19:53-20:12/19	05:40	20:03-20:28/25					
	17:15	15:58-16:33/35	17:55		19:29		20:03		20:36		20:57						
21	07:41	08:45-09:07/22	07:07		07:20		06:28	19:19-19:42/23	05:51	19:53-20:12/19	05:40	20:03-20:28/25					
	17:17	15:59-16:34/35	17:57		19:30		20:04		20:37		20:58						
22	07:41	08:46-09:06/20	07:05		07:19		06:27	19:18-19:43/25	05:50	19:54-20:14/20	05:41	20:04-20:29/25					
	17:18	16:01-16:34/33	17:58		19:31		20:05		20:38		20:58						
23	07:40	08:48-09:06/18	07:04		07:17		06:25	19:18-19:44/26	05:49	19:54-20:15/21	05:41	20:04-20:29/25					
	17:19	16:02-16:34/32	17:59		19:32		20:06		20:39		20:58						
24	07:39	08:49-09:05/16	07:02		07:15		06:24	19:17-19:45/28	05:48	19:54-20:15/21	05:41	20:04-20:29/25					
	17:20	16:04-16:36/32	18:00		19:34		20:07		20:40		20:58						
25	07:38	08:51-09:03/12	07:01		07:13		06:22	19:17-19:46/29	05:48	19:54-20:16/22	05:41	20:03-20:29/26					
	17:22	16:04-16:36/32	18:02		19:35		20:09		20:41		20:59						
26	07:38	08:54-09:01/7	06:59		07:12		06:21	19:18-19:48/30	05:47	19:54-20:17/23	05:42	20:04-20:30/26					
	17:23	16:04-16:36/32	18:03		19:36		20:10		20:42		20:59						
27	07:37	16:04-16:37/33	06:57		07:10		06:19	19:17-19:48/31	05:46	19:54-20:18/24	05:42	20:04-20:29/25					
	17:24		18:04		19:37		20:11		20:42		20:59						
28	07:36	16:04-16:37/33	06:56		07:08 19:13-19:17/4		06:18	19:18-19:48/30	05:46	19:55-20:19/24	05:42	20:05-20:30/25					
	17:25		18:05		19:38		20:12	19:48-19:50/2	20:43		20:59						
29	07:35	16:04-16:37/33			07:06 19:09-19:18/9		06:16	19:17-19:47/30	05:45	19:55-20:19/24	05:43	20:04-20:30/26					
	17:27				19:39		20:13	19:47-19:50/3	20:44		20:59						
30	07:34	16:05-16:37/32			07:05 19:07-19:18/11		06:15	19:18-19:47/29	05:44	19:55-20:20/25	05:43	20:04-20:30/26					
	17:28				19:40		20:14	19:47-19:52/5	20:45		20:59						
31	07:33	16:05-16:37/32			07:03 19:05-19:19/14				05:44	19:56-20:21/25							
	17:29				19:42				20:46								
Potential sun hours	294		295		370		401		452		457						
Sum of minutes with flicker	1714		203		38		781		639		770						

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

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Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110WTG: 111 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (152)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	July		August		September		October		November		December	
1	05:44	20:05-20:31/26	06:09	20:08-20:14/6	06:42	19:02-19:22/20	07:14	06:50			07:27	08:22-08:49/27
	20:59		20:39		19:53	19:22-19:31/9	19:00	17:12			16:46	15:34-16:06/32
2	05:44	20:04-20:31/27	06:10	19:48-19:57/9	06:43	19:00-19:23/23	07:15	06:51	15:47-15:56/9		07:28	08:22-08:49/27
	20:58		20:38	20:10-20:12/2	19:51	19:23-19:29/6	18:59	17:10			16:46	15:34-16:05/31
3	05:45	20:05-20:31/26	06:11	19:46-19:59/13	06:44	18:59-19:24/25	07:16	06:53	15:45-16:00/15		07:29	08:23-08:49/26 15:34-16:03/29
	20:58		20:37		19:49	19:24-19:27/3	18:57	17:09			16:45	08:50-08:58/8
4	05:45	20:05-20:32/27	06:12	19:44-20:00/16	06:45	18:58-19:24/26	07:17	06:54	15:42-16:02/20		07:30	08:23-09:00/37
	20:58		20:36		19:48	19:24-19:26/2	18:55	17:08			16:45	15:35-16:02/27
5	05:46	20:05-20:32/27	06:13	19:43-20:02/19	06:46	18:57-19:24/27	07:18	06:55	15:40-16:03/23		07:31	08:23-09:01/38
	20:58		20:34		19:46		18:53	17:07			16:45	15:35-16:02/27
6	05:47	20:05-20:32/27	06:14	19:36-19:46/10	06:47	18:57-19:22/25	07:19	06:56	15:40-16:05/25		07:32	08:24-09:03/39
	20:58		20:33	19:46-20:03/17	19:44		18:52	17:05			16:45	15:35-16:02/27
7	05:47	20:05-20:31/26	06:15	19:33-19:49/16	06:48	18:56-19:20/24	07:20	06:58	15:39-16:05/26		07:33	08:25-09:04/39
	20:57		20:32	19:49-20:03/14	19:43		18:50	17:04			16:45	15:36-16:03/27
8	05:48	20:05-20:31/26	06:16	19:31-19:51/20	06:49	18:56-19:19/23	07:22	06:59	15:38-16:06/28		07:34	08:25-09:05/40
	20:57		20:31	19:51-20:04/13	19:41		18:48	17:03			16:45	15:36-16:03/27
9	05:49	20:05-20:31/26	06:17	19:30-19:52/22	06:50	18:56-19:17/21	07:23	07:00	15:38-16:07/29		07:35	08:26-09:06/40 15:37-16:03/26
	20:57		20:29	19:52-20:04/12	19:39		18:47	17:02			16:45	15:23-15:26/3
10	05:49	20:05-20:30/25	06:18	19:28-19:53/25	06:51	18:56-19:15/19	07:24	07:01	15:37-16:07/30		07:35	08:27-09:07/40 15:38-16:04/26
	20:56		20:28	19:53-20:03/10	19:37		18:45	17:01			16:45	15:21-15:29/8
11	05:50	20:05-20:30/25	06:19	19:27-19:54/27	06:52	18:56-19:13/17	07:25	07:03	15:36-16:08/32		07:36	08:27-09:08/41 15:37-16:03/26
	20:56		20:27	19:54-20:02/8	19:36		18:43	17:00			16:45	15:21-15:31/10
12	05:51	20:05-20:29/24	06:21	19:26-19:54/28	06:53	18:57-19:12/15	07:26	07:04	15:37-16:09/32		07:37	08:27-09:08/41 15:38-16:04/26
	20:55		20:25	19:54-20:00/6	19:34		18:42	16:59			16:45	15:20-15:31/11
13	05:52	20:05-20:29/24	06:22	19:25-19:55/30	06:54	18:58-19:10/12	07:27	07:05	15:36-16:09/33		07:38	08:28-09:09/41 15:39-16:04/25
	20:55		20:24	19:55-19:59/4	19:32		18:40	16:58			16:45	15:20-15:32/12
14	05:52	20:04-20:28/24	06:23	19:25-19:55/30	06:56	18:59-19:08/9	07:28	07:06	15:36-16:09/33		07:39	08:29-09:09/40 15:39-16:05/26
	20:54		20:23	19:55-19:58/3	19:30		18:38	16:57			16:45	15:20-15:33/13
15	05:53	20:04-20:28/24	06:24	19:24-19:55/31	06:57	19:01-19:06/5	07:30	07:08	15:37-16:09/32		07:39	08:30-09:10/40 15:40-16:06/26
	20:54		20:21	19:55-19:56/1	19:29		18:37	16:56			16:45	15:20-15:35/15
16	05:54	20:04-20:27/23	06:25	19:25-19:56/31	06:58		07:31	07:09	08:27-08:34/7		07:40	08:29-09:10/41 15:40-16:05/25
	20:53		20:20		19:27		18:35	16:55	15:37-16:09/32		16:46	15:19-15:35/16
17	05:55	20:04-20:27/23	06:26	19:24-19:54/30	06:59		07:32	07:10	08:24-08:36/12		07:41	08:30-09:11/41 15:41-16:06/25
	20:53		20:18		19:25		18:33	16:54	15:37-16:09/32		16:46	15:20-15:36/16
18	05:56	20:04-20:26/22	06:27	19:24-19:53/29	07:00		07:33	07:11	08:23-08:39/16		07:42	08:31-09:12/41 15:42-16:07/25
	20:52		20:17		19:23		18:32	16:53	15:38-16:10/32		16:46	15:21-15:37/16
19	05:57	20:03-20:25/22	06:28	19:24-19:51/27	07:01		07:34	07:13	08:22-08:40/18		07:42	08:31-09:12/41 15:42-16:07/25
	20:51		20:15		19:21		18:30	16:53	15:37-16:09/32		16:47	15:20-15:37/17
20	05:57	20:03-20:24/21	06:29	19:24-19:50/26	07:02		07:35	07:14	08:21-08:41/20		07:43	08:32-09:13/41 15:43-16:07/24
	20:50		20:14		19:20		18:29	16:52	15:36-16:09/33		16:47	15:21-15:38/17
21	05:58	20:03-20:24/21	06:30	19:24-19:48/24	07:03		07:37	07:15	08:21-08:43/22		07:43	08:32-09:13/41 15:43-16:07/24
	20:50		20:12		19:18		18:27	16:51	15:34-16:09/35		16:47	15:21-15:38/17
22	05:59	20:04-20:23/19	06:31	19:24-19:47/23	07:04		07:38	07:16	08:21-08:43/22		07:44	08:33-09:14/41 15:44-16:08/24
	20:49		20:11		19:16		18:26	16:50	15:34-16:09/35		16:48	15:22-15:39/17
23	06:00	20:04-20:22/18	06:32	19:24-19:45/21	07:05		07:39	07:17	08:20-08:44/24		07:44	08:33-09:14/41 15:44-16:08/24
	20:48		20:09		19:14		18:24	16:50	15:34-16:09/35		16:48	15:22-15:39/17
24	06:01	20:04-20:22/18	06:33	19:21-19:32/11	07:06		07:40	07:19	08:20-08:44/24		07:45	08:34-09:15/41 15:45-16:09/24
	20:47		20:08	19:32-19:44/12	19:13		18:23	16:49	15:33-16:08/35		16:49	15:23-15:40/17
25	06:02	20:04-20:21/17	06:34	19:18-19:34/16	07:07		07:41	07:20	08:21-08:46/25		07:45	08:34-09:15/41 15:45-16:10/25
	20:46		20:06	19:34-19:42/8	19:11		18:21	16:49	15:34-16:09/35		16:50	15:23-15:40/17
26	06:03	20:05-20:20/15	06:35	19:16-19:35/19	07:08		07:43	07:21	08:21-08:46/25		07:46	08:34-09:15/41 15:45-16:10/25
	20:45		20:04	19:35-19:41/6	19:09		18:20	16:48	15:33-16:08/35		16:50	15:24-15:40/16
27	06:04	20:05-20:19/14	06:36	19:15-19:36/21	07:09		07:44	07:22	08:20-08:46/26		07:46	08:35-09:16/41 15:45-16:10/25
	20:44		20:03	19:36-19:39/3	19:07		18:18	16:48	15:33-16:08/35		16:51	15:25-15:41/16
28	06:05	20:06-20:18/12	06:38	19:14-19:36/22	07:10		07:45	07:23	08:20-08:47/27		07:46	08:35-09:16/41 15:46-16:11/25
	20:43		20:01	19:36-19:37/1	19:06		18:17	16:47	15:33-16:07/34		16:52	15:26-15:41/15
29	06:06	20:06-20:17/11	06:39	19:13-19:36/23	07:12		07:46	07:24	08:21-08:47/26		07:46	08:36-09:16/40 15:46-16:12/26
	20:42		20:00		19:04		18:16	16:47	15:33-16:06/33		16:52	15:26-15:40/14
30	06:07	20:07-20:17/10	06:40	19:07-19:19/12	07:13		07:48	07:25	08:22-08:48/26		07:47	08:36-09:16/40 15:46-16:12/26
	20:41		19:56	19:19-19:34/15	19:02		18:14	16:46	15:33-16:05/32		16:53	15:27-15:40/13
31	06:08	20:07-20:15/8	06:41	19:04-19:21/17			07:49				07:47	08:36-09:17/41 15:47-16:13/26
	20:40		19:55	19:21-19:32/11			18:13				16:54	15:28-15:40/12
Potential sun hours	464		431		375		343		294		283	
Sum of minutes with flicker	658		800		311		0		1192		2349	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

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8/31/2015 11:06 AM / 62

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit SFA_Vestas V110WTG: 112 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (145)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

January		February		March		April		May		June	
1	07:47 15:49-16:10/21	07:32 16:20-16:34/14		06:54 17:04-17:37/33		07:01 07:37-08:07/30		06:14 19:18-19:53/35	05:43 06:14-06:48/34		
	16:55 16:13-16:27/14	17:31 16:34-17:01/27		18:07		19:43 18:34-19:21/47		20:15	20:47		
2	07:47 15:50-16:10/20	07:31 16:20-17:02/42		06:53 17:04-17:37/33		07:00 07:36-08:06/30		06:12 19:18-19:52/34	05:43 06:13-06:47/34		
	16:56 16:13-16:28/15	17:32		18:08		19:44 18:40-19:22/42		20:16	20:47		
3	07:47 15:51-16:10/19	07:30 16:21-17:02/41		06:51 17:04-17:37/33		06:58 07:36-08:05/29		06:11 19:18-19:52/34	05:42 06:13-06:48/35		
	16:57 16:13-16:29/16	17:33		18:09		19:45 18:41-19:23/42		20:18	20:48		
4	07:47 15:52-16:10/18	07:29 16:22-17:02/40		06:49 17:04-17:36/32		06:56 07:36-08:04/28		06:10 19:18-19:52/34	05:42 06:13-06:48/35		
	16:58 16:13-16:30/17	17:35		18:10		19:46 18:41-19:23/42		20:19	20:49		
5	07:47 15:53-16:10/17	07:28 16:21-17:01/40		06:48 17:04-17:35/31		06:54 07:38-08:03/25		06:08 19:18-19:52/34	05:42 06:13-06:49/36		
	16:59 16:13-16:31/18	17:36		18:11		19:47 18:42-19:25/43		20:20	20:50		
6	07:47 15:54-16:10/16	07:27 16:22-17:01/39		06:46 17:05-17:35/30		06:53 07:38-08:01/23		06:07 19:18-19:51/33	05:41 06:13-06:49/36		
	17:00 16:13-16:32/19	17:37		18:13		19:48 18:42-19:26/44		20:21	20:50		
7	07:47 15:55-16:10/15	07:25 16:23-17:01/38		06:44 17:06-17:34/28		06:51 07:39-07:59/20		06:06 19:18-19:51/33	05:41 06:14-06:50/36		
	17:01 16:13-16:33/20	17:39		18:14		19:49 18:41-19:26/45		20:22	20:51		
8	07:47 15:56-16:09/13	07:24 16:25-17:01/36		07:43 18:06-18:32/26		06:49 07:42-07:57/15		06:05 19:19-19:50/31	05:41 06:13-06:49/36		
	17:02 16:12-16:33/21	17:40 17:06-17:13/7		19:15		19:51 18:42-19:26/44		20:23	20:52		
9	07:47 15:57-16:09/12	07:23 07:54-07:55/1 17:02-17:16/14		07:41 18:08-18:31/23		06:48 07:45-07:53/8		06:03 19:20-19:50/30	05:41 06:13-06:50/37		
	17:03 16:13-16:35/22	17:41 16:25-17:00/35		19:16		19:52 18:43-19:26/43		20:24	20:52		
10	07:46 15:59-16:08/9	07:22 07:48-07:59/11 17:00-17:18/18		07:39 18:09-18:29/20		06:46 18:43-19:25/42		06:02 19:20-19:49/29	05:40 06:13-06:50/37		
	17:04 16:13-16:36/23	17:42 16:27-16:59/32		19:17		19:53		20:25	20:53		
11	07:46 16:03-16:06/3	07:20 07:46-08:02/16 16:59-17:20/21		07:38 18:11-18:26/15		06:44 18:44-19:25/41		06:01 19:21-19:49/28	05:40 06:14-06:51/37		
	17:05 16:13-16:37/24	17:44 16:29-16:58/29		19:19 18:42-18:50/8		19:54		20:26	20:54		
12	07:46 16:13-16:37/24	07:19 07:45-08:03/18 16:57-17:21/24		07:36 18:16-18:21/5		06:43 18:45-19:24/39		06:00 19:22-19:48/26	05:40 06:14-06:51/37		
	17:06	17:45 16:30-16:56/26		19:20 18:37-18:54/17		19:55		20:27	20:54		
13	07:46 16:13-16:38/25	07:18 07:44-08:04/20 16:45-16:53/8		07:34 18:35-18:57/22		06:41 18:47-19:23/36		05:59 19:23-19:47/24	05:40 06:14-06:51/37		
	17:07	17:46 16:35-16:41/6 16:57-17:22/25		19:21		19:56		20:29	20:55		
14	07:45 16:13-16:38/25	07:17 07:43-08:05/22		07:33 18:33-18:58/25		06:39 18:49-19:23/34		05:58 19:24-19:46/22	05:40 06:14-06:52/38		
	17:08	17:48 16:56-17:23/27		19:22		19:57		20:30	20:55		
15	07:45 16:13-16:39/26	07:15 07:42-08:05/23		07:31 18:31-18:59/28		06:38 18:54-19:21/27		05:57 19:26-19:44/18	05:40 06:14-06:52/38		
	17:09	17:49 16:55-17:23/28		19:23		19:58		20:31	20:56		
16	07:44 16:13-16:40/27	07:14 07:42-08:06/24		07:29 18:30-19:00/30		06:36 18:58-19:21/23		05:56 19:27-19:42/15	05:40 06:15-06:52/37		
	17:10	17:50 16:55-17:26/31		19:24		20:00		20:32	20:56		
17	07:44 16:14-16:42/28	07:12 07:42-08:06/24		07:27 18:29-19:01/32		06:35 18:58-19:19/21		05:55 19:30-19:40/10	05:40 06:15-06:52/37		
	17:12 16:42-16:43/1	17:51 16:55-17:27/32		19:26		20:00		20:33	20:56		
18	07:43 16:14-16:42/28	07:11 07:42-08:06/24		07:26 18:28-19:01/33		06:33 18:59-19:16/17		05:54	05:40 06:15-06:52/37		
	17:13 16:42-16:44/2	17:53 16:55-17:29/34		19:27		20:01		20:34	20:57		
19	07:43 16:14-16:42/28	07:10 07:42-08:06/24		07:24 18:27-19:04/37		06:31 19:02-19:14/12		05:53 06:25-06:33/8	05:40 06:15-06:52/37		
	17:14 16:42-16:45/3	17:54 16:55-17:31/36		19:28		20:02		20:35	20:57		
20	07:42 16:15-16:43/28	07:08 07:42-08:05/23		07:22 18:27-19:07/40		06:30 19:31-19:41/10		05:52 06:22-06:36/14	05:40 06:15-06:52/37		
	17:15 16:43-16:47/4	17:55 16:55-17:31/36		19:29		20:03		20:36	20:57		
21	07:41 16:15-16:43/28	07:07 07:43-08:05/22		07:20 07:50-08:01/11		06:28 19:28-19:42/14		05:51 06:20-06:38/18	05:40 06:15-06:52/37		
	17:17 16:43-16:47/4	17:57 16:56-17:33/37		19:30 18:26-19:08/42		20:04		20:37	20:58		
22	07:41 16:15-16:42/27	07:05 07:43-08:03/20		07:19 07:46-08:03/17		06:27 19:26-19:43/17		05:50 06:19-06:40/21	05:41 06:16-06:53/37		
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23	07:40 16:15-16:43/28	07:04 07:45-08:03/18		07:17 07:44-08:05/21		06:25 19:24-19:44/20		05:49 06:18-06:41/23	05:41 06:16-06:53/37		
	17:19 16:42-16:51/9	17:59 16:57-17:35/38		19:32 18:25-19:10/45		20:06		20:39	20:58		
24	07:39 16:17-16:44/27	07:02 07:46-08:01/15		07:15 07:43-08:07/24		06:24 19:22-19:45/23		05:49 06:17-06:42/25	05:41 06:16-06:53/37		
	17:20 16:43-16:54/11	18:00 16:57-17:36/39		19:34 18:26-19:11/45		20:07		20:40	20:58		
25	07:38 16:17-16:44/27	07:00 07:47-07:58/11		07:13 07:41-08:07/26		06:22 19:22-19:46/24		05:48 06:17-06:43/26	05:41 06:17-06:54/37		
	17:22 16:43-16:55/12	18:02 16:58-17:36/38		19:35 18:26-19:11/45		20:09		20:41	20:58		
26	07:38 16:18-16:43/25	06:59 17:00-17:37/37		07:12 07:40-08:07/27		06:21 19:21-19:48/27		05:47 06:16-06:44/28	05:42 06:17-06:54/37		
	17:23 16:42-16:57/15	18:03		19:36 18:26-19:13/47		20:10		20:41	20:59		
27	07:37 16:19-16:43/24	06:57 17:02-17:37/35		07:10 07:38-08:08/30		06:19 19:20-19:48/28		05:46 06:15-06:44/29	05:42 06:16-06:54/38		
	17:24 16:42-16:58/16	18:04		19:37 18:26-19:14/48		20:11		20:42	20:59		
28	07:36 16:19-16:42/23	06:56 17:04-17:38/34		07:08 07:38-08:08/30		06:18 19:20-19:50/30		05:46 06:15-06:45/30	05:42 06:17-06:55/38		
	17:25 16:41-16:59/18	18:05		19:38 18:28-19:16/48		20:12		20:43	20:59		
29	07:35 16:19-16:41/22			07:06 07:37-08:08/31		06:16 19:18-19:50/32		05:45 06:14-06:45/31	05:43 06:17-06:54/37		
	17:27 16:40-16:59/19			19:39 18:28-19:16/48		20:13		20:44	20:59		
30	07:34 16:20-16:40/20			07:05 07:37-08:08/31		06:15 19:18-19:52/34		05:44 06:14-06:47/33	05:43 06:18-06:55/37		
	17:28 16:39-17:00/21			19:40 18:29-19:16/47		20:14		20:45	20:59		
31	07:33 16:20-16:39/19			07:03 07:36-08:07/31				05:44 06:14-06:47/33			
	17:29 16:38-17:01/23			19:42 18:31-19:19/48				20:46			
32	1036	1398		1366		1151		789	1100		

Project:

2015-08-31_Arkwright Summit_SFA

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Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110**WTG:** 112 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (145)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

July		August		September		October		November		December	
1	05:44 20:59	06:18-06:55/37	06:09 19:31-19:58/27 20:39	06:42 18:43-19:24/41 19:53	07:14 18:16-18:34/18 19:00			06:50 07:18-07:28/10 16:30-16:48/18 17:12 15:56-16:29/33	07:26 15:45-15:48/3 16:46 15:55-16:19/24		
2	05:44 20:58	06:18-06:55/37	06:10 19:30-19:58/28 20:38	06:43 18:42-19:24/42 19:51	07:15 17:52-18:03/11 18:59 18:18-18:31/13			06:51 15:55-16:30/35 17:10 16:32-16:45/13	07:28 15:43-15:51/8 16:46 15:56-16:19/23		
3	05:45 20:58	06:18-06:55/37	06:11 19:30-19:59/29 20:37	06:44 07:43-07:51/8 19:49 18:41-19:24/43	07:16 17:48-18:06/18 18:57			06:53 15:54-16:31/37 17:09 16:36-16:42/6	07:29 15:41-15:53/12 16:45 15:57-16:19/22		
4	05:45 20:58	06:19-06:56/37	06:12 19:29-20:00/31 20:36	06:45 07:39-07:54/15 19:48 18:39-19:23/44	07:17 17:46-18:07/21 18:55			06:54 15:53-16:31/38 17:08	07:30 15:41-15:54/13 16:45 15:57-16:19/22		
5	05:46 20:58	06:19-06:55/36	06:13 19:28-20:00/32 20:34	06:46 07:36-07:56/20 19:46 18:38-19:23/45	07:18 17:44-18:08/24 18:53			06:55 15:52-16:31/39 17:07	07:31 15:40-15:55/15 16:45 15:58-16:18/20		
6	05:47 20:58	06:19-06:55/36	06:14 19:28-20:00/32 20:33	06:47 07:35-07:57/22 19:44 18:38-19:22/44	07:19 17:43-18:10/27 18:52			06:56 15:52-16:32/40 17:05	07:32 15:40-15:56/16 16:45 15:59-16:18/19		
7	05:47 20:57	06:19-06:55/36	06:15 19:27-20:01/34 20:32	06:48 07:33-07:58/25 19:43 18:37-19:20/43	07:20 17:41-18:10/29 18:50			06:58 15:51-16:32/41 17:04	07:33 15:40-15:57/17 16:45 16:00-16:18/18		
8	05:48 20:57	06:20-06:55/35	06:16 19:27-20:01/34 20:31	06:49 07:32-07:59/27 19:41 18:36-19:19/43	07:22 17:40-18:11/31 18:48			06:59 15:51-16:32/41 17:03	07:34 15:40-15:58/18 16:45 16:01-16:18/17		
9	05:49 20:57	06:20-06:56/36	06:17 19:27-20:01/34 20:29	06:50 07:31-07:59/28 19:39 18:35-19:17/42	07:23 17:39-18:11/32 18:47			07:00 15:51-16:33/42 17:02	07:34 15:40-15:59/19 16:45 16:02-16:18/16		
10	05:49 20:56	06:20-06:55/35	06:18 19:26-20:01/35 20:28	06:51 07:30-07:59/29 19:37 18:34-19:15/41	07:24 17:38-18:11/33 18:45			07:01 15:51-16:06/15 17:01 16:06-16:32/26	07:35 15:40-16:00/20 16:45 16:03-16:18/15		
11	05:50 20:56	06:21-06:55/34	06:19 19:26-20:01/35 20:27	06:52 07:29-07:59/30 19:36 18:26-19:13/47	07:25 17:38-18:11/33 18:43			07:03 15:51-16:10/19 17:00 16:09-16:32/23	07:36 15:39-16:00/21 16:45 16:03-16:17/14		
12	05:51 20:55	06:22-06:55/33	06:21 19:26-20:00/34 20:25	06:53 07:28-07:59/31 19:34 18:23-19:11/48	07:26 17:38-18:11/33 18:42			07:04 15:52-16:12/20 16:59 16:11-16:32/21	07:37 15:40-16:01/21 16:45 16:05-16:17/12		
13	05:52 20:55	06:22-06:55/33	06:22 19:26-19:59/33 20:24	06:54 07:28-07:59/31 19:32 18:21-19:08/47	07:27 17:37-18:11/34 18:40			07:05 15:51-16:13/22 16:58 16:12-16:31/19	07:38 15:40-16:02/22 16:45 16:06-16:17/11		
14	05:52 20:54	06:22-06:54/32	06:23 19:26-19:58/32 20:23	06:56 07:28-07:58/30 19:30 18:19-19:07/48	07:28 17:36-18:10/34 18:38			07:06 15:51-16:14/23 16:57 16:13-16:30/17	07:39 15:40-16:02/22 16:45 16:07-16:17/10		
15	05:53 20:54	06:23-06:54/31	06:24 19:26-19:56/30 20:21	06:57 07:27-07:58/31 19:29 18:17-19:05/48	07:30 17:34-18:09/35 18:37			07:08 15:52-16:16/24 16:56 16:15-16:31/16	07:39 15:41-16:03/22 16:45 16:09-16:17/8		
16	05:54 20:53	06:24-06:54/30	06:25 19:28-19:56/28 20:20	06:58 07:27-07:57/30 19:27 18:16-19:04/48	07:31 08:22-08:27/5 18:35 17:31-18:08/37			07:09 15:51-16:16/25 16:55 16:15-16:29/14	07:40 15:41-16:03/22 16:46 16:09-16:16/7		
17	05:55 20:53	06:25-06:53/28	06:26 19:28-19:54/26 20:18	06:59 07:28-07:56/28 19:25 18:14-19:02/48	07:32 08:19-08:31/12 18:33 17:30-18:08/38			07:10 15:50-16:17/27 16:54 16:16-16:28/12	07:41 15:41-16:04/23 16:46 16:11-16:16/5		
18	05:56 20:52	06:26-06:53/27	06:27 19:29-19:53/24 20:17	07:00 07:28-07:55/27 19:23 18:13-18:59/46	07:33 08:17-08:33/16 18:32 17:29-18:07/38			07:11 15:51-16:18/27 16:53 16:17-16:28/11	07:41 15:42-16:05/23 16:46 16:12-16:16/4		
19	05:57 20:51	06:27-06:52/25	06:28 19:29-19:51/22 20:15	07:01 07:29-07:53/24 19:21 18:12-18:57/45	07:34 08:15-08:34/19 18:30 17:27-18:05/38			07:13 15:50-16:18/28 16:53 16:17-16:26/9	07:42 15:42-16:05/23 16:47		
20	05:57 20:50	06:27-06:51/24	06:29 19:30-19:50/20 20:14	07:02 07:30-07:51/21 19:20 18:12-18:56/44	07:35 08:13-08:34/21 18:29 17:26-18:04/38			07:14 15:50-16:17/27 16:52 16:17-16:23/6	07:43 15:43-16:06/23 16:47		
21	05:58 20:50	06:28-06:50/22	06:30 19:32-19:48/16 20:12	07:03 07:31-07:49/18 19:18 18:11-18:55/44	07:37 08:13-08:36/23 18:27 17:26-18:03/37			07:15 15:50-16:18/28 16:51 16:18-16:23/5	07:43 15:43-16:06/23 16:47		
22	05:59 20:49	06:30-06:49/19	06:31 19:33-19:47/14 20:11	07:04 07:33-07:46/13 19:16 18:11-18:53/42	07:38 08:12-08:36/24 18:26 17:25-18:02/37			07:16 15:51-16:19/28 16:50 16:19-16:23/4	07:44 15:44-16:07/23 16:48		
23	06:00 20:48	06:31-06:47/16	06:32 19:36-19:45/9 20:09	07:05 18:10-18:51/41 19:14	07:39 08:12-08:36/24 18:24 17:25-18:00/35			07:17 15:51-16:19/28 16:50 16:19-16:22/3	07:44 15:44-16:07/23 16:48		
24	06:01 20:47	06:34-06:45/11	06:33 19:06-19:18/12 20:08	07:06 18:10-18:49/39 19:13	07:40 08:11-08:35/24 18:23 17:24-17:59/35			07:19 15:51-16:19/28 16:49 16:19-16:21/2	07:45 15:45-16:08/23 16:49		
25	06:02 20:46		06:34 19:03-19:20/17 20:06	07:07 18:10-18:45/35 19:11	07:41 08:12-08:36/24 18:21 17:25-17:57/32			07:20 15:51-16:19/28 16:49 16:19-16:20/1	07:45 15:45-16:08/23 16:50 16:16-16:18/2		
26	06:03 20:45	09:42-19:49/7	06:35 19:01-19:22/21 20:04	07:08 18:11-18:43/32 19:09	07:43 08:12-08:35/23 18:20 17:25-17:55/30			07:21 15:52-16:19/27 16:48	07:45 15:45-16:08/23 16:50 16:15-16:20/5		
27	06:04 20:44	09:39-19:52/13	06:36 18:59-19:23/24 20:03	07:09 18:12-18:42/30 19:07	07:44 08:12-08:34/22 18:18 17:25-17:53/28			07:22 15:52-16:18/26 16:48	07:46 15:46-16:08/22 16:51 16:14-16:21/7		
28	06:05 20:43	09:37-19:54/17	06:38 18:55-19:23/28 20:01	07:10 18:12-18:41/29 19:06	07:45 08:13-08:34/21 18:17 17:26-17:53/27			07:23 15:53-16:18/25 16:47	07:46 15:47-16:09/22 16:52 16:15-16:23/8		
29	06:06 20:42	09:36-19:55/19	06:39 18:50-19:24/34 19:58	07:12 18:13-18:39/26 19:04	07:46 08:14-08:33/19 17:14-17:24/10 18:16 17:03-17:12/9 17:27-17:52/25			07:24 15:53-16:18/25 16:47	07:46 15:47-16:09/22 16:52 16:14-16:24/10		
30	06:07 20:41	09:34-19:57/23	06:40 18:47-19:24/37 19:56	07:13 18:14-18:37/23 19:02	07:48 08:14-08:32/18 17:27-17:50/23 18:14 17:00-17:26/26			07:25 15:54-16:18/24 16:46	07:47 15:48-16:10/22 16:53 16:14-16:24/10		
31	06:08 20:40	09:32-19:57/25	06:41 18:45-19:24/39 19:55	 	07:49 08:16-08:31/15 17:29-17:50/21 18:13 16:58-17:28/30			 	07:47 15:48-16:10/22 16:54 16:14-16:25/11		
Hours	464	431	375	343	294	283					
ker	831	851	1726	1330	1097	931					

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

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Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110WTG: 114 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (131)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	July		August		September		October		November		December
1	05:44	20:16-20:28/12	06:09	06:56-07:05/9	06:42	07:03-07:27/24	07:14	07:48-08:05/17	06:50	07:26	
	20:58		20:39		19:53		19:00		17:12	16:46	
2	05:44	20:17-20:27/10	06:10	06:53-07:07/14	06:43	07:04-07:27/23	07:15	07:46-08:06/20	06:51	07:27	
	20:58		20:38		19:51		18:58		17:10	16:46	
3	05:45	20:19-20:27/8	06:11	06:51-07:09/18	06:44	07:05-07:26/21	07:16	07:44-08:06/22	06:52	07:28	
	20:58		20:37		19:49		18:57		17:09	16:45	
4	05:45	20:21-20:26/5	06:12	06:50-07:10/20	06:45	07:06-07:25/19	07:17	07:43-08:07/24	06:54	07:29	
	20:58		20:36		19:48	07:27-07:30/3	18:55		17:08	16:45	
5	05:46		06:13	06:48-07:11/23	06:46	07:07-07:34/27	07:18	07:42-08:07/25	06:55	07:30	
	20:58		20:34		19:46		18:53		17:07	16:45	
6	05:47		06:14	06:47-07:12/25	06:47	07:08-07:36/28	07:19	07:42-08:08/26	06:56	07:31	
	20:57		20:33		19:44		18:52		17:05	16:45	
7	05:47		06:15	06:47-07:12/25	06:48	07:09-07:37/28	07:20	07:42-08:08/26	06:57	07:32	
	20:57		20:32		19:42		18:50		17:04	16:45	
8	05:48		06:16	06:46-07:13/27	06:49	07:10-07:16/6	07:21	07:42-08:07/25	06:59	07:33	
	20:57		20:31		19:41	07:17-07:38/21	18:48		17:03	16:45	
9	05:49		06:17	06:45-07:13/28	06:50	07:16-07:38/22	07:23	07:43-08:06/23	07:00	07:34	
	20:56		20:29		19:39		18:46		17:02	16:45	
10	05:49		06:18	06:45-07:14/29	06:51	07:15-07:38/23	07:24	07:44-08:05/21	07:01	07:35	
	20:56		20:28		19:37		18:45		17:01	16:45	
11	05:50		06:19	06:44-07:14/30	06:52	07:14-07:38/24	07:25	07:45-08:04/19	07:02	07:36	
	20:56		20:27		19:35		18:43		17:00	16:45	
12	05:51		06:20	06:44-07:14/30	06:53	07:14-07:38/24	07:26	07:47-08:04/17	07:04	07:37	
	20:55		20:25		19:34		18:41		16:59	16:45	
13	05:52		06:22	06:45-07:15/30	06:54	07:15-07:37/22	07:27	07:48-08:02/14	07:05	07:38	
	20:55		20:24		19:32		18:40		16:58	16:45	
14	05:52		06:23	06:45-07:15/30	06:55	07:16-07:36/20	07:28	07:49-08:00/11	07:06	07:38	
	20:54		20:22		19:30		18:38		16:57	16:45	
15	05:53		06:24	06:46-07:14/28	06:56	07:17-07:36/19	07:29	07:50-07:57/7	07:07	07:39	
	20:54		20:21		19:28	07:36-07:43/7	18:37		16:56	16:45	
16	05:54		06:25	06:47-07:14/27	06:58	07:18-07:35/17	07:31		07:09	07:40	
	20:53		20:20		19:27	07:35-07:46/11	18:35		16:55	16:46	
17	05:55		06:26	06:48-07:13/25	06:59	07:19-07:34/15	07:32		07:10	07:41	
	20:52		20:18		19:25	07:34-07:47/13	18:33		16:54	16:46	
18	05:56		06:27	06:49-07:13/24	07:00	07:20-07:32/12	07:33		07:11	07:41	
	20:52		20:17		19:23	07:32-07:48/16	18:32		16:53	16:46	
19	05:57		06:28	06:50-07:12/22	07:01	07:21-07:29/8	07:34		07:12	07:42	
	20:51		20:15		19:21	07:29-07:48/19	18:30		16:53	16:47	
20	05:57		06:29	06:51-07:11/20	07:02	07:26-07:48/22	07:35		07:14	07:43	
	20:50		20:14		19:20		18:29		16:52	16:47	
21	05:58		06:30	06:52-07:10/18	07:03	07:25-07:48/23	07:36		07:15	07:43	
	20:49		20:12		19:18		18:27		16:51	16:47	
22	05:59		06:31	06:53-07:08/15	07:04	07:24-07:48/24	07:38		07:16	07:44	
	20:49		20:11		19:16		18:26		16:50	16:48	
23	06:00		06:32	06:54-07:06/12	07:05	07:25-07:48/23	07:39		07:17	07:44	
	20:48		20:09	07:12-07:23/11	19:14		18:24		16:50	16:48	
24	06:01		06:33	06:55-07:03/8	07:06	07:26-07:47/21	07:40		07:18	07:45	
	20:47		20:07	07:10-07:25/15	19:12		18:23		16:49	16:49	
25	06:02		06:34	07:08-07:26/18	07:07	07:27-07:46/19	07:41		07:20	07:45	
	20:46		20:06		19:11		18:21		16:49	16:50	
26	06:03		06:35	07:07-07:27/20	07:08	07:29-07:46/17	07:43		07:21	07:45	
	20:45		20:04		19:09		18:20		16:48	16:50	
27	06:04		06:36	07:05-07:27/22	07:09	07:30-07:45/15	07:44		07:22	07:46	
	20:44		20:03		19:07		18:18		16:48	16:51	
28	06:05		06:37	07:04-07:28/24	07:10	07:31-07:43/12	07:45		07:23	07:46	
	20:43		20:01		19:05		18:17		16:47	16:52	
29	06:06		06:39	07:04-07:28/24	07:11	07:32-07:40/8	07:46		07:24	07:46	
	20:42		19:58		19:04	07:55-07:59/4	18:16		16:47	16:52	
30	06:07		06:40	07:03-07:28/25	07:13	07:33-07:35/2	07:47		07:25	07:46	
	20:41		19:56		19:02	07:50-08:03/13	18:14		16:46	16:53	
31	06:08		06:41	07:03-07:28/25			07:49			07:47	
	20:40		19:54				18:13			16:54	
Potential sun hours	463		431		375		343		294	0	0
Sum of minutes with flicker	35		721		675		297		0	0	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

Project:

2015-08-31_Arkwright Summit_SFA

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Licensed user:

EDR

217 Montgomery St.

US-SYRACUSE, NY 13202

(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110**WTG:** 115 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (135)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117	541	386	285	8,759

Idle start wind speed: Cut in wind speed from power curve

	January		February		March		April		May		June		
1	07:47	15:38-16:05/27	07:32	16:11-17:01/50	06:54	17:07-17:43/36	07:01	07:46-08:11/25	06:14	19:26-19:53/27	05:43	06:18-06:54/36	19:47-20:22/35
	16:55	16:04-16:24/20	17:31		18:06		19:43		20:15		20:47	06:53-07:00/7	
2	07:47	15:38-16:06/28	07:31	16:13-17:01/48	06:53	17:06-17:43/37	07:00	07:47-08:09/22	06:12	19:25-19:53/28	05:43	06:18-06:53/35	19:47-20:22/35
	16:56	16:05-16:25/20	17:32		18:08		19:44		20:16		20:47	06:52-07:00/8	
3	07:47	15:39-16:06/27	07:30	16:15-17:02/47	06:51	17:06-17:44/38	06:58	07:48-08:07/19	06:11	19:24-19:55/31	05:42	06:18-06:53/35	19:47-20:23/36
	16:57	16:05-16:26/21	17:33		18:09		19:45		20:18		20:48	06:52-07:01/9	
4	07:47	15:40-16:06/26	07:29	16:18-16:28/10	06:49	17:06-17:44/38	06:56	07:50-08:03/13	06:10	19:24-19:56/32	05:42	06:18-06:53/35	19:46-20:23/37
	16:58	16:05-16:27/22	17:35	16:24-17:02/38	18:10		19:46		20:19		20:49	06:52-07:00/8	
5	07:47	15:41-16:06/25	07:28	16:24-17:01/37	06:48	17:05-17:44/39	06:54		06:08	19:24-19:57/33	05:42	06:18-06:53/35	19:47-20:23/36
	16:59	16:05-16:28/23	17:36		18:11		19:47		20:20		20:50	06:52-07:01/9	
6	07:47	15:42-16:06/24	07:27	16:24-17:02/38	06:46	17:05-17:44/39	06:53		06:07	19:23-19:56/33	05:41	06:19-06:53/34	19:47-20:24/37
	17:00	16:05-16:29/24	17:37	17:04-17:07/3	18:13		19:48		20:21		20:50	06:52-07:01/9	
7	07:47	15:43-16:06/23	07:25	07:52-08:01/9	06:44	17:05-17:43/38	06:51		06:06	19:23-19:56/33	05:41	06:19-06:53/34	19:47-20:24/37
	17:01	16:05-16:30/25	17:39	16:24-17:12/48	18:14		19:49		20:22		20:51	06:52-07:02/10	
8	07:47	15:44-16:05/21	07:24	07:50-08:04/14	07:43	18:05-18:43/38	06:49		06:05	19:23-19:56/33	05:41	06:19-06:52/33	19:47-20:24/37
	17:02	16:04-16:30/26	17:40	16:25-17:15/50	19:15		19:51		20:23		20:52	06:51-07:01/10	
9	07:47	15:45-16:05/20	07:23	07:48-08:06/18	07:41	18:06-18:43/37	06:48		06:03	19:24-19:56/32	05:41	06:19-06:53/34	19:47-20:24/37
	17:03	16:04-16:31/27	17:41	16:25-17:16/51	19:16		19:52		20:24		20:52	06:52-07:01/9	
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	17:08		17:48	16:30-17:22/52	19:22		19:57		20:30	06:48-06:52/4	20:55	06:52-07:03/11	
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	17:09		17:49	16:31-17:22/51	19:23	18:10-18:34/24	19:58		20:31	06:48-06:52/4	20:56	06:52-07:03/11	
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	17:13		17:53	16:50-17:22/32	19:27		20:01		20:34	06:50-06:54/4	20:57	06:52-07:03/11	
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	17:15	16:38-16:45/7	17:55	16:50-17:22/32	19:29		20:03		20:36	06:51-06:55/4	20:57	06:52-07:03/11	
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25	07:38	16:04-16:55/51	07:00	16:53-17:39/46	07:13	07:44-08:17/33	06:22	19:14-19:40/26	05:48	06:19-06:54/35	05:41	06:24-06:55/31	19:49-20:28/39
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	17:24		18:04		19:37		20:11	19:37-19:48/11	20:42	06:52-06:59/7	20:59	06:54-07:05/11	
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	17:25		18:05		19:38		20:12	19:36-19:50/14	20:43	06:53-06:59/6	20:59	06:55-07:06/11	
29	07:35	16:07-16:59/52			07:06	07:44-08:15/31	06:16	19:19-19:33/14	05:45	06:18-06:53/35	05:42	06:24-06:56/32	19:51-20:29/38
	17:27				19:39		20:13	19:33-19:50/17	20:44	06:52-06:59/7	20:59	06:55-07:06/11	
30	07:34	16:08-17:00/52			07:05	07:44-08:13/29	06:15	19:22-19:30/8	05:44	06:18-06:54/36	05:43	06:25-06:57/32	19:51-20:29/38
	17:28				19:40		20:14	19:30-19:52/22	20:45	06:53-07:00/7	20:59	06:56-07:06/10	
31	07:33	16:09-17:00/51			07:03	07:44-08:12/28			05:44	06:18-06:53/35			
	17:29				19:41				20:46	06:52-07:00/8			
Potential sun hours	294		295		370		401		452		457		
Sum of minutes with flicker	1399		1646		1018		590		1664		2380		

Project:

2015-08-31_Arkwright Summit_SFA

Printed/Page

8/31/2015 11:06 AM / 67

Licensed user:

EDR217 Montgomery St.
US-SYRACUSE, NY 13202
(315) 471 0688

Jacob Runner / jrunner@edrdpc.com

Calculated:

8/31/2015 10:27 AM/2.9.285

SHADOW - Calendar per WTG**Calculation:** 2015-08-31_Arkwright Summit_SFA_Vestas V110**WTG:** 115 - VESTAS V110-2.0 2000 110.0 !O! hub: 95.0 m (TOT: 150.0 m) (135)**Assumptions for shadow calculations**

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.31	0.38	0.46	0.51	0.56	0.65	0.67	0.64	0.57	0.50	0.29	0.27

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
265	284	269	265	242	250	327	425	908	1,160	924	1,111	1,117		541	386	285 8,759

Idle start wind speed: Cut in wind speed from power curve

	July			August			September			October			November			December		
1	05:44	06:24-06:57/33	19:51-20:29/38	06:09	06:40-06:55/15	19:34-20:05/31	06:42	19:22-19:31/9	07:14	17:47-18:18/31		06:50	07:16-07:36/20	07:26	15:31-15:46/15			
	20:59	06:56-07:06/10		20:39	06:55-06:59/4		19:53		19:00			17:12	15:55-16:47/52	16:46	15:45-16:15/30			
2	05:44	06:25-06:58/33	19:51-20:29/38	06:10	06:42-06:52/10	19:34-20:06/32	06:43	19:24-19:29/5	07:15	17:45-18:19/34		06:51	07:17-07:34/17	07:28	15:30-15:48/18			
	20:58	06:57-07:07/10		20:38	06:52-06:57/5		19:51		18:59			17:10	15:55-16:46/51	16:46	15:47-16:15/28			
3	05:45	06:25-06:58/33	19:52-20:30/38	06:11	06:45-06:54/9		06:44		07:16	17:44-18:19/35		06:53	07:20-07:33/13	07:29	15:29-15:49/20			
	20:58	06:57-07:07/10		20:37	19:34-20:06/32		19:49		18:57			17:09	15:55-16:43/48	16:45	15:48-16:15/27			
4	05:45	06:25-06:58/33	19:53-20:30/37	06:12	19:33-20:06/33		06:45		07:17	17:43-18:19/36		06:54	07:22-07:30/8	07:30	15:29-15:50/21			
	20:58	06:57-07:07/10		20:36			19:48		18:55			17:08	15:54-16:42/48	16:45	15:49-16:15/26			
5	05:46	06:25-06:58/33	19:52-20:30/38	06:13	19:33-20:06/33		06:46		07:18	17:42-18:19/37		06:55	15:54-16:31/37	07:31	15:28-15:51/23			
	20:58	06:57-07:07/10		20:34			19:46		18:53			17:07		16:45	15:50-16:15/25			
6	05:47	06:25-06:59/34	19:53-20:30/37	06:14	19:33-20:06/33		06:47		07:19	17:42-18:20/38		06:56	15:54-16:32/38	07:32	15:28-15:52/24			
	20:58	06:58-07:07/9		20:33			19:44		18:52			17:05		16:45	15:51-16:15/24			
7	05:47	06:25-06:59/34	19:53-20:30/37	06:15	19:33-20:06/33		06:48		07:20	17:41-18:20/39		06:58	15:48-15:58/10	07:33	15:28-15:53/25			
	20:57	06:58-07:07/9		20:32			19:43		18:50			17:04	15:54-16:32/38	16:45	15:52-16:15/23			
8	05:48	06:25-07:00/35	19:53-20:30/37	06:16	19:33-20:05/32		06:49	07:45-07:58/13	07:22	17:41-18:19/38		06:59	15:44-16:32/48	07:34	15:28-15:54/26			
	20:57	06:59-07:07/8		20:31			19:41		18:48			17:03		16:45	15:53-16:15/22			
9	05:49	06:26-07:00/34	19:54-20:30/36	06:17	19:33-20:04/31		06:50	07:42-08:01/19	07:23	17:40-18:19/39		07:00	15:43-16:32/49	07:34	15:28-15:55/27			
	20:57	06:59-07:08/9		20:29			19:39		18:47			17:02		16:45	15:54-16:15/21			
10	05:49	06:25-07:00/35	19:54-20:29/35	06:18	19:33-20:03/30		06:51	07:40-08:02/22	07:24	17:40-18:18/38		07:01	15:41-16:32/51	07:35	15:28-15:56/28			
	20:56	06:59-07:07/8		20:28			19:37		18:45			17:01		16:45	15:55-16:15/20			
11	05:50	06:25-07:01/36	19:55-20:30/35	06:19	19:33-20:02/29		06:52	07:38-08:03/25	07:25	17:40-18:17/37		07:03	15:40-16:31/51	07:36	15:28-15:55/27			
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	20:49	07:01-07:06/5	20:03-20:23/20	20:11			19:16		18:26	17:20-17:53/33		16:50	16:14-16:21/7	16:48	16:01-16:18/17			
23	06:00	06:31-07:02/31	19:42-19:59/17	06:32	19:18-19:45/27		07:05	07:32-08:01/29	07:39	08:14-08:39/25		07:17	15:38-16:14/36	07:44	15:32-16:02/30			
	20:48	07:01-07:06/5	20:04-20:22/18	20:09			19:14		18:24	17:20-17:52/32		16:50	16:14-16:18/4	16:48	16:01-16:18/17			
24	06:01	06:32-07:02/30	19:41-20:00/19	06:33	19:17-19:44/27		07:06	07:32-07:59/27	07:40	08:14-08:39/25	17:19-17:52/33	07:19	15:38-16:13/35	07:45	15:32-16:03/31			
	20:47	07:01-07:06/5	20:06-20:21/15	20:08			19:13		18:23	17:10-17:15/5		16:49		16:49	16:02-16:18/16			
25	06:02	06:33-07:02/29	19:40-20:02/22	06:34	19:17-19:42/25		07:07	07:34-07:58/24	07:41	08:14-08:40/26		07:20	15:38-16:13/35	07:45	15:33-16:04/31			
	20:46	07:01-07:05/4	20:09-20:18/9	20:06			19:11		18:21	17:06-17:52/46		16:49		16:50	16:03-16:20/17			
26	06:03	06:34-07:02/28	19:39-20:03/24	06:35	19:17-19:41/24		07:08	07:35-07:56/21	07:43	08:14-08:39/25		07:21	15:39-16:14/35	07:45	15:34-16:04/30			
	20:45	07:01-07:05/4		20:04			19:09	18:00-18:09/9	18:20	17:03-17:52/49		16:48		16:50	16:03-16:20/17			
27	06:04	06:35-07:01/26	19:38-20:04/26	06:36	19:17-19:39/22		07:09	07:37-07:54/17	07:44	08:13-08:39/26		07:22	15:39-16:14/35	07:46	15:34-16:04/30			
	20:44	07:00-07:04/4		20:03			19:07	17:55-18:13/18	18:18	17:00-17:51/51		16:48		16:51	16:03-16:20/17			
28	06:05	06:35-07:01/26	19:37-20:04/27	06:38	19:18-19:37/19		07:10	07:40-07:50/10	07:45	08:14-08:39/25		07:23	15:40-16:14/34	07:46	15:35-16:05/30			
	20:43	07:00-07:04/4		20:01			19:06	17:53-18:15/22	18:17	17:00-17:51/51		16:47		16:52	16:04-16:22/18			
29	06:06	06:36-07:00/24	19:37-20:05/28	06:39	19:18-19:36/18		07:12	17:50-18:16/26	07:46	08:14-08:38/24		07:24	15:36-15:37/1	07:47	15:36-16:05/29			
	20:42	06:59-07:03/4		19:58			19:04		18:16	16:58-17:50/52		16:47	15:40-16:14/34	16:52	16:04-16:22/18			
30	06:07	06:37-06:59/22	19:36-20:06/30	06:40	19:19-19:34/15		07:13	17:48-18:17/29	07:48	08:14-08:38/24		07:25	15:32-15:42/10	07:47	15:36-16:05/29			
	20:41	06:58-07:02/4		19:56			19:02		18:14	16:57-17:49/52		16:46	15:42-16:14/32	16:53	16:04-16:23/19			
31	06:08	06:39-06:57/18	19:35-20:05/30	06:41	19:20-19:32/12				07:49	08:16-08:37/21				16:47	15:37-16:05/28			
	20:40	06:56-07:00/4		19:55					18:13	16:56-17:49/53				16:54	16:04-16:24/20			
Potential sun hours	464			431			375		343			294		283				
Sum of minutes with flicker	2174			914			671		1603			1410		1437				