

APPENDIX K
SHADOW FLICKER IMPACT ANALYSIS

Shadow Flicker Impact Analysis for the Na Pua Makani Wind Energy Project Oahu, Hawaii

Prepared for

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ATTACHMENT

Attachment A. Detailed Summary of WindPro Shadow Flicker Analysis Results

1.0 OVERVIEW

Na Pua Makani Power Partners, LLC (NPMPP), is proposing to develop the Na Pua Makani Wind Energy Project (Project) on Oahu, Hawaii (see Figure 1). The Project is undergoing environmental review under both the Hawaii Environmental Policy Act (HEPA) and the National Environmental Policy Act (NEPA). As part of this review, the Project is analyzing three alternatives: Alternative 1 – no action; Alternative 2 (the Proposed Action) – construction and operation of an up to approximately 25 MW Project consisting of up to 10 wind turbines; and Alternative 3 – construction and operation of a larger generation facility of up to 42 MW and consisting of up to 12 turbines. Tetra Tech has conducted a shadow flicker analysis for Project Alternatives 2 and 3 the results of which are provided in this report.

In response to public comments on the Draft EIS related to visual impacts and consideration of turbines with larger generating capacities (to reduce the total number of turbines), NPMPP reevaluated the proposed turbine locations and turbine models considered in the Draft EIS. Through this effort, NPMPP was able to reduce the maximum number of turbines needed to meet the target generating capacity for the Project. This modification takes advantage of recent technological advancements that have resulted in the availability of uprated versions of turbine models that are larger, more efficient, have increased generating capacity, and are better suited for the moderate to low wind conditions of the wind farm site than previous models. Accordingly, the updated shadow flicker impact analysis evaluates a Modified Proposed Action Option (Alternative 2A) along with the original project alternatives and turbine design, which incorporate updated turbine locations.

2.0 PROJECT COMPONENTS

NPMPP is currently considering turbine models from leading turbine manufacturers including Siemens, Vestas, GE and others. The turbine array could include a combination of models from a single manufacturer ranging in generating capacity and dimensions. For the purposes of impact analysis, Tetra Tech analyzed a turbine array that included the turbines with the tallest maximum blade tip height with the assumption that the tallest turbine would cast the furthest shadow and therefore potentially have the greatest effect. NPMPP will select the most appropriate turbines for the site-specific conditions of the wind farm prior to construction.

Three representative wind turbine models were selected to evaluate potential shadow flicker impacts. These models which represent the general range in dimensions of turbines that could be installed on site, have the following characteristics:

- **Vestas V110-2.0** - 3-blade 110-meter diameter rotor, with a hub height of 80 meters. Assumption that the 2.0-110 WT has a normal high rotor speed of approximately 14.9 rotations per minute (rpm) which translates to a blade pass frequency of 0.75 Hertz (Hz) which is less than 1 alternation per second.

- **Siemens SWT-3.0-113** - 3-blade 113-meter diameter rotor, with a hub height of 99.5 meters. Assumption that the 3.0-113 WT has a normal high rotor speed of approximately 14.7 rpm which translates to a blade pass frequency of 0.74 Hz (less than 1 alternation per second).
- **Siemens SWT-3.0-130** - 3-blade 130-meter diameter rotor, utilizing hub heights of 85, 115, and 135 meters, depending turbine location. The SWT 3.0-113 wind turbine has a normal high rotor speed of approximately 12.2 rpm which translates to a blade pass frequency of 0.61 Hz (less than 1 alternation per second).

Smaller turbine models (Vestas V110-2.0) may be considered for turbine locations 1 and 2 , and larger turbines (Siemens SWT-3.0-113) may be considered for locations 3 to 10 (or up to turbine location 12 for Alternative 3). The combination of turbine models and specific number of turbines under each alternative will be selected to ensure consistency with HECO grid requirements, onsite wind resources, and other Project-specific factors. The Alternative 2 design is based on construction of ten (10) turbines (numbers 1-5, and 8-12), and Alternative 3 design is based on the construction of all twelve (12) turbines (numbers 1-12). If Alternative 3 were selected, the project would be built in two phases, with the first phase build out of up to 10 turbines (up to approximately 25 MW), and the second phase builds out of the remaining turbines, for total of 12 turbines (up to approximately 42 MW).

The Modified Proposed Action Option (Alternative 2A) is based on the Siemens SWT 3.3-130 turbine model for all locations with a rotor diameter of 130 meters and hub heights of varying elevation (85 m, 115 m, and 135 m) depending on turbine location. A total of 9 turbines were assumed for the Modified Proposed Action Option.

3.0 SHADOW FLICKER BACKGROUND

A wind turbine's moving blades can cast a moving shadow on locations within a certain distance of a turbine. These moving shadows are called shadow flicker, and can be a temporary phenomenon experienced at nearby residences or public gathering places. The impact area depends on the time of year and day (which determine the sun's azimuth and altitude angles) and the wind turbine's physical characteristics (height, rotor diameter, blade width, and orientation of the rotor blades). Shadow flicker impact to surrounding properties generally occurs during low angle sunlight conditions, typically during sunrise and sunset times of the day. However, when the sun angle gets very low (less than 3 degrees), sunlight passes through more atmosphere and becomes too diffused to form a coherent shadow. Shadow flicker will not occur when the sun is obscured by clouds or fog, at night, or when the source turbine(s) are not operating. In addition, shadow flicker is only an issue when at least 20% of the sun's disc is covered by the turbine blades.

Shadow flicker intensity is defined as the difference in brightness at a given location in the presence and absence of a shadow. Shadow flicker intensity diminishes with greater receptor-to-

turbine separation distance. Shadow flicker intensity for receptor-to-turbine distances beyond 2,500 meters (8,202 feet) is very low and generally considered imperceptible. In general, increasing proximity to turbines may make shadow flicker more noticeable, with the largest number of shadow flicker hours, along with greatest shadow flicker intensity, occurring nearest the wind turbines.

Shadow flicker frequency is related to the wind turbine's rotor blade speed and the number of blades on the rotor. From a health standpoint, the low flicker frequencies associated with wind turbines, are harmless, and public concerns that flickering light from wind turbines can have negative health effects, such as triggering seizures in people with epilepsy are unfounded. Epilepsy Action (working name for the British Epilepsy Foundation) states that there is no evidence that wind turbines can cause seizures (Epilepsy Action 2008). However, they recommend that wind turbine flicker frequency be limited to 3 Hz. (For comparison, strobe lights used in discotheques have frequencies which range from about 3 Hz to 10 Hz (1 Hz = 1 flash per second). Since the proposed Project's wind turbine blade pass frequency is approximately 0.74-0.8 Hz (less than 1 alternation per second), no negative health effects to individuals with photosensitive epilepsy are anticipated.

Shadow flicker impacts are not regulated in applicable state or federal law, and there is no permitting threshold with regard to hours per year of anticipated impacts to a receptor from a wind energy project. A threshold of 30 hours per year has been widely used in the industry as a target value in the absence of formal guidelines. This threshold originally came from German court case, where a judge found 30 hours of actual shadow flicker per year at a certain neighbor's property to be tolerable (WindPower 2003). The 30 hours per year threshold value has been widely used in the industry as a target value in the absence of formal guidelines. However, predicted shadow flicker greater than this threshold does not necessarily create a nuisance and is still well below concerns for impacts to health such as triggering epileptic seizures.

4.0 WINDPRO SHADOW FLICKER ANALYSIS

An analysis of potential shadow flicker impacts from the Project was conducted using the WindPro software package. The turbine array provided by NPMPP (layout dated December 4, 2015 for both the original Alternatives 2 and 3 and the Modified Proposed Action Option (Alternative 2A)), which includes up to twelve (12) turbine locations, was included in the analysis. The analysis evaluated the following three turbine scenarios:

- Alternative 2: Two (2) Vestas V110-2.0 plus eight (8) Siemens SWT-3.0-113 wind turbines
- Alternative 3: Two (2) Vestas V110-2.0 plus ten (10) Siemens SWT-3.0-113 wind turbines
- Alternative 2A: Nine (9) Siemens SWT-3.3-130 wind turbines

The WindPro analysis was conducted to determine shadow flicker impacts under realistic impact conditions (actual expected shadow). This analysis calculated the total amount of time

(hours and minutes per year) that shadow flicker are expected to occur at receptors surrounding the project. The realistic impact condition scenario is based on the following assumptions:

- The elevation and position geometries of the wind turbines and surrounding receptors (potentially occupied residences). Elevations were determined using United States Geological Survey (USGS) digital elevation model (DEM) data. Positions geometries were determined using geographic information system (GIS) and referenced to Universal Transverse Mercator (UTM) Zone 4 (NAD83).
- The position of the sun and the incident sunlight relative to the wind turbine and receptors on a minute-by-minute basis over the course of a year.
- Historical sunshine availability (percent of total hours available). Historical sunshine rates for the area (as summarized by the National Climatic Data Center (NCDC 2008) for nearby Honolulu, Hawaii) used in this analysis are as follows:

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
65%	68%	72%	70%	72%	74%	76%	77%	77%	70%	65%	63%

- Estimated wind turbine operations and orientation (based on approximately 4 years of wind data (4/7/09 – 6/27/13), including the wind speed and wind direction frequency distribution, measured at on-site meteorological towers).
- Receptor viewpoints (i.e., house windows) are conservatively assumed to always be directly facing turbine to sun line of sight (“greenhouse mode”).

WindPro incorporates terrain elevation contour information and the analysis accounts for terrain elevation differences. The sun’s path with respect to each turbine location is calculated by the software to determine the cast shadow paths every minute over a full year. Sun angles less than 3 degrees above the horizon were excluded, for the reasons identified earlier in this section. Since shadow flicker is only an issue when at least 20% of the sun disc is covered by the blades, WindPro uses blade width dimension data to calculate the maximum distance from the turbine where shadow flicker must be calculated. Beyond this distance, the turbine will not contribute to the shadow flicker impact.

It should be noted however, that WindPro provides a conservative estimate of shadow flicker as obstacles such as trees, haze, and visual obstructions (window facing, coverings) are not fully accounted for despite the likelihood of their reducing or eliminating shadow flicker impacts to receptors. A total of 737 receptor locations were identified within 2.5 kilometers of proposed Project turbines. A receptor in the model is defined as a 1 meter squared area (approximate size of a typical window), 1 meter (3.28 feet) aboveground level. Approximate eye level is set at 1.5 meters (4.94 feet). Figure 2 shows the receptor locations and proposed Project turbines location proposed for Alternatives 2, 3, and 2A.

5.0 SHADOW FLICKER ANALYSIS RESULTS

As expected, WindPro predicts that shadow flicker impacts will be greatest at locations nearer to the wind turbines. Figures 3, 4 and 5 describe the WindPro predicted shadow flicker impact areas for turbine Alternatives 2, 3, and 2A, respectively. Note that Alternative 1 in the associated Environmental Impact Statement is the No Action alternative, under which the Project would not be constructed. Therefore, it is not discussed further here.

Tables 1, 2, and 3 present the WindPro predicted shadow flicker impacts for the receptors with predicted annual shadow flicker impact greater than 30 hours per year, for each of the turbine alternatives modelled. Under Alternative 2 (the Proposed Action), 17 of the 737 receptors had expected shadow flicker impacts of more than 30 hours per year. The predicted shadow flicker impact at any receptor ranged from 0 to 244 hours and 9 minutes (Receptor 647) which is approximately 5.5 percent of the potential available daylight hours. Under Alternative 3 (larger generation wind project), 19 of the 737 receptors had expected shadow flicker impacts of more than 30 hours per year. The predicted shadow flicker impact at any receptor ranged from 0 hours to 393 hours 10 minutes per year (Receptor 647), which is approximately 8.9 percent of the potential available daylight hours. Under Alternative 2A (the Modified Proposed Action Option), 25 of the 737 receptors had expected shadow flicker impacts of more than 30 hours per year. The predicted shadow flicker impact at any receptor ranged from 0 to 258 hours and 19 minutes (Receptor 647), which is approximately 5.8 percent of the potential available daylight hours. **A detailed WindPro shadow flicker analysis summary, for the full build-out scenario (Alternative 3) for each of the modeled receptor location, is provided in Attachment A.**

Table 1. WindPro Predicted Shadow Flicker Impacts for Receptors with Maximum Expected Impacts – Turbine Alternative 2

Receptor ID	Shadow Hours per Year (expected) [hh:mm / year]	Receptor Status
647	244:09:00	Malaekahana (participating property); farm structure
609	123:24:00	Malaekahana (participating property); farm structure
595	122:38:00	Kahuku Agriculture Park; residence
607	121:50:00	Malaekahana (participating property); farm structure
608	107:01:00	Malaekahana (participating property); farm structure
610	90:55:00	Malaekahana (participating property); farm structure
600	85:43:00	Kahuku Agriculture Park; residence
599	69:28:00	Kahuku Agriculture Park; residence
602	61:38:00	Kahuku Agriculture Park; residence
594	57:43:00	Kahuku Agriculture Park; residence
743	55:58:00	Malaekahana (participating property); farm structure
593	52:00:00	Kahuku Agriculture Park; residence
601	51:56:00	Kahuku Agriculture Park; residence
648	49:05:00	Malaekahana (participating property); farm structure
450	46:26:00	Malaekahana (participating property); farm structure
645	43:48:00	Malaekahana (participating property); farm structure
452	32:58:00	Malaekahana (participating property); farm structure

Table 2. WindPro Predicted Shadow Flicker Impacts for Receptors with Maximum Expected Impacts – Turbine Alternative 3

Receptor ID	Shadow Hours per Year (expected) [hh:mm / year]	Receptor Status
647	393:10:00	Malaekahana (participating property); farm structure
648	286:46:00	Malaekahana (participating property); farm structure
607	160:05:00	Malaekahana (participating property); farm structure
608	135:29:00	Malaekahana (participating property); farm structure
609	130:46:00	Malaekahana (participating property); farm structure
595	127:13:00	Non Project Participant
645	108:39:00	Malaekahana (participating property); farm structure
610	104:16:00	Malaekahana (participating property); farm structure
600	95:38:00	Non Project Participant
599	77:03:00	Non Project Participant
602	68:30:00	Non Project Participant
646	64:56:00	Malaekahana (participating property); farm structure
594	60:34:00	Malaekahana (participating property); farm structure
742	55:58:00	Malaekahana (participating property); farm structure
450	55:19:00	Malaekahana (participating property); farm structure
593	52:00:00	Non Project Participant
601	51:57:00	Non Project Participant
452	32:59:00	Malaekahana (participating property); farm structure
431	31:35:00	Malaekahana (participating property); farm structure

Table 3. WindPro Predicted Shadow Flicker Impacts for Receptors with Maximum Expected Impacts – Turbine Alternative 2a

Receptor ID	Shadow Hours per Year (expected) [hh:mm / year]	Receptor Status
647	258:19:00	Malaekahana (participating property); farm structure
595	174:46:00	Non Project Participant
607	147:47:00	Malaekahana (participating property); farm structure
609	146:26:00	Malaekahana (participating property); farm structure
608	105:37:00	Malaekahana (participating property); farm structure
610	104:51:00	Malaekahana (participating property); farm structure
600	101:30:00	Non Project Participant
599	95:00:00	Non Project Participant
594	85:08:00	Non Project Participant
593	84:35:00	Non Project Participant
602	82:04:00	Non Project Participant
601	79:24:00	Non Project Participant
648	78:06:00	Malaekahana (participating property); farm structure
743	65:53:00	Malaekahana (participating property); farm structure
450	63:49:00	Malaekahana (participating property); farm structure
452	59:12:00	Malaekahana (participating property); farm structure
606	49:14:00	Malaekahana (participating property); farm structure
645	39:58:00	Malaekahana (participating property); farm structure
592	35:29:00	Non Project Participant
431	34:41:00	Malaekahana (participating property); farm structure
530	30:55:00	Non Project Participant

Table 3. WindPro Predicted Shadow Flicker Impacts for Receptors with Maximum Expected Impacts – Turbine Alternative 2a (continued)

Receptor ID	Shadow Hours per Year (expected) [hh:mm / year]	Receptor Status
531	30:46:00	Non Project Participant
529	30:41:00	Non Project Participant
532	30:27:00	Non Project Participant
528	30:10:00	Non Project Participant

The shadow flicker impact prediction statistics are summarized in Tables 4 through 6, for each of the turbine alternatives modeled.

Table 4. Statistical Summary of WindPro Predicted Shadow Flicker Impacts at Modeled Receptor Locations – Turbine Alternative 2

Cumulative Shadow Flicker Time (expected)	Number of Receptors
Total	737
= 0 Hours	490
> 0 Hours < 10 Hours	162
≥ 10 Hours < 20 Hours	60
≥ 20 Hours < 30 Hours	8
≥ 30 Hours	17

Table 5. Statistical Summary of WindPro Predicted Shadow Flicker Impacts at Modeled Receptor Locations – Turbine Alternative 3

Cumulative Shadow Flicker Time (expected)	Number of Receptors
Total	737
= 0 Hours	489
> 0 Hours < 10 Hours	162
≥ 10 Hours < 20 Hours	60
≥ 20 Hours < 30 Hours	7
≥ 30 Hours	19

Table 6. Statistical Summary of WindPro Predicted Shadow Flicker Impacts at Modeled Receptor Locations – Turbine Alternative 2a

Cumulative Shadow Flicker Time (expected)	Number of Receptors
Total	737
= 0 Hours	537
> 0 Hours < 10 Hours	70
≥ 10 Hours < 20 Hours	75
≥ 20 Hours < 30 Hours	30
≥ 30 Hours	25

6.0 CONCLUSION

The analysis of potential shadow flicker impacts from the Project on nearby receptors shows that shadow flicker impacts for the large majority of receptors expected to be well within acceptable industry standard ranges for avoiding nuisance impacts. The analysis was deliberately conservative and actual shadow flicker is expected to occur for less than the modeled durations. The analysis assumes that the receptors all have a direct in-line view of the incoming shadow flicker sunlight and does not account for trees or other obstructions which may block sunlight. In reality, the windows of many houses will not face the sun directly for the key shadow flicker impact times.

Only 17 of the 737 receptors modeled had expected shadow flicker impacts of more than 30 hours per year under the Proposed Action. Of these 17 receptors, 109 are located within the Project boundary on the Malaekahana Hui West, LLC parcel which is leasing land to the Project developer ~~and will work with tenant farmers to mitigate any possible shadow flicker impacts~~. No federal, state, or local regulations regulate shadow flicker; however, the 30 hours per year threshold is an industry standard that has been widely adopted in the United States as a threshold to evaluate shadow flicker impacts. There would be no shadow flicker impacts (zero hours of shadow flicker time) at the Kahuku Elementary School, Kahuku High School, or Kahuku Medical Center.

Mitigation measures such as strategic vegetative screening and/or installation of curtains and blinds on the windows facing the turbine casting the shadows are effective and economically viable mitigation options that the Project could consider on an individual basis with landowners, if necessary.

7.0 REFERENCES

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FIGURES

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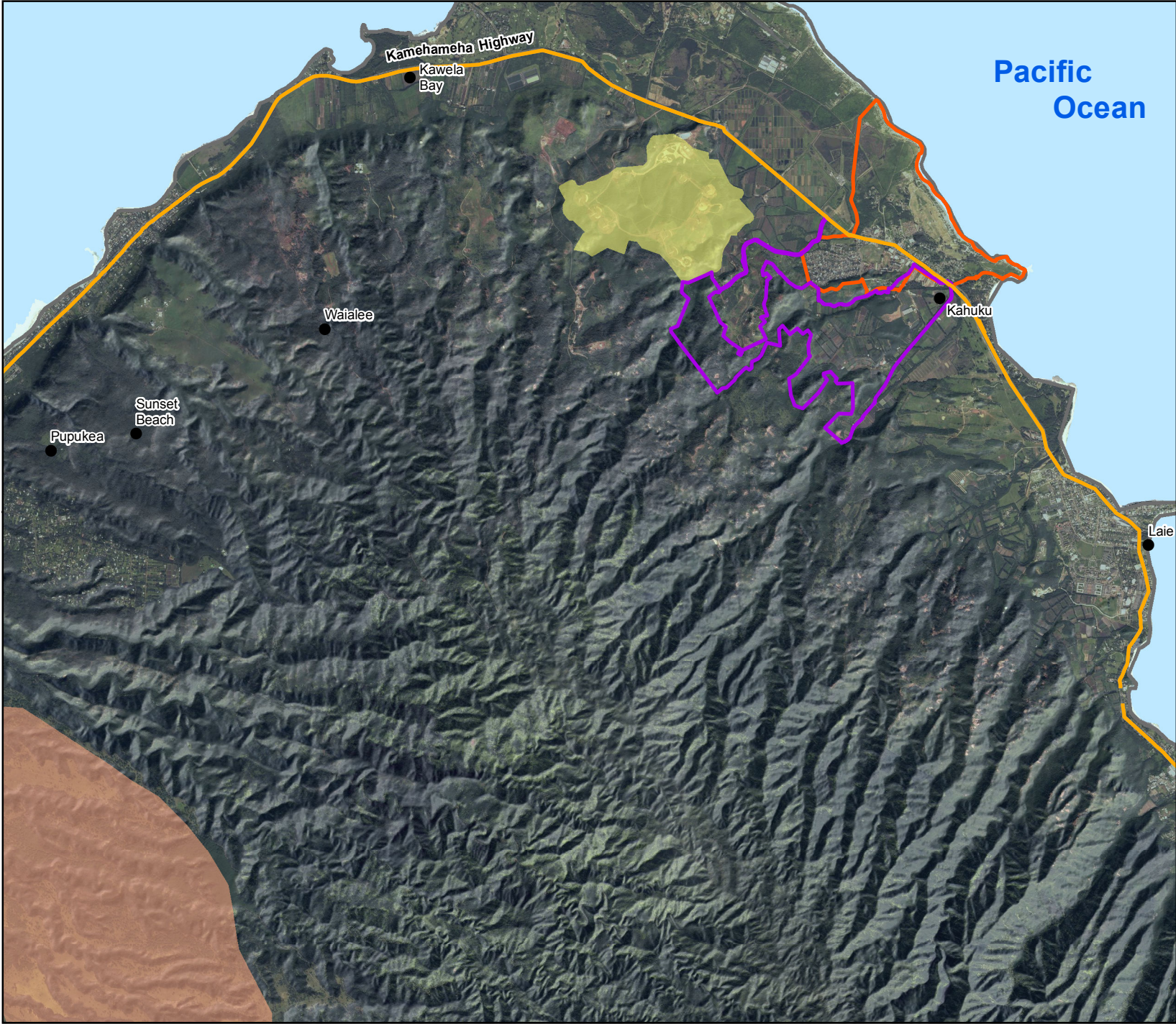


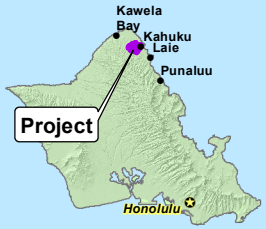
Figure 1

**Na Pua Makani
Wind Project**

Vicinity Map

Oahu, HI
December 2015

-  Wind Farm Site
-  Kahuku Town
-  Kahuku Wind Farm (First Wind)
-  Kawaioloa Wind Farm (First Wind)
-  State Highway
-  City/Town



 1:65,000 WGS 1984 UTM 4 0 0.5 1 2 3 4 5 Miles

Data Sources Champlin: project facilities / ESRI: roads, cities / Hawaii Statewide GIS Program: city boundaries, vicinity wind projects, Kahuku training facility / USDA NAIP: aerial imagery

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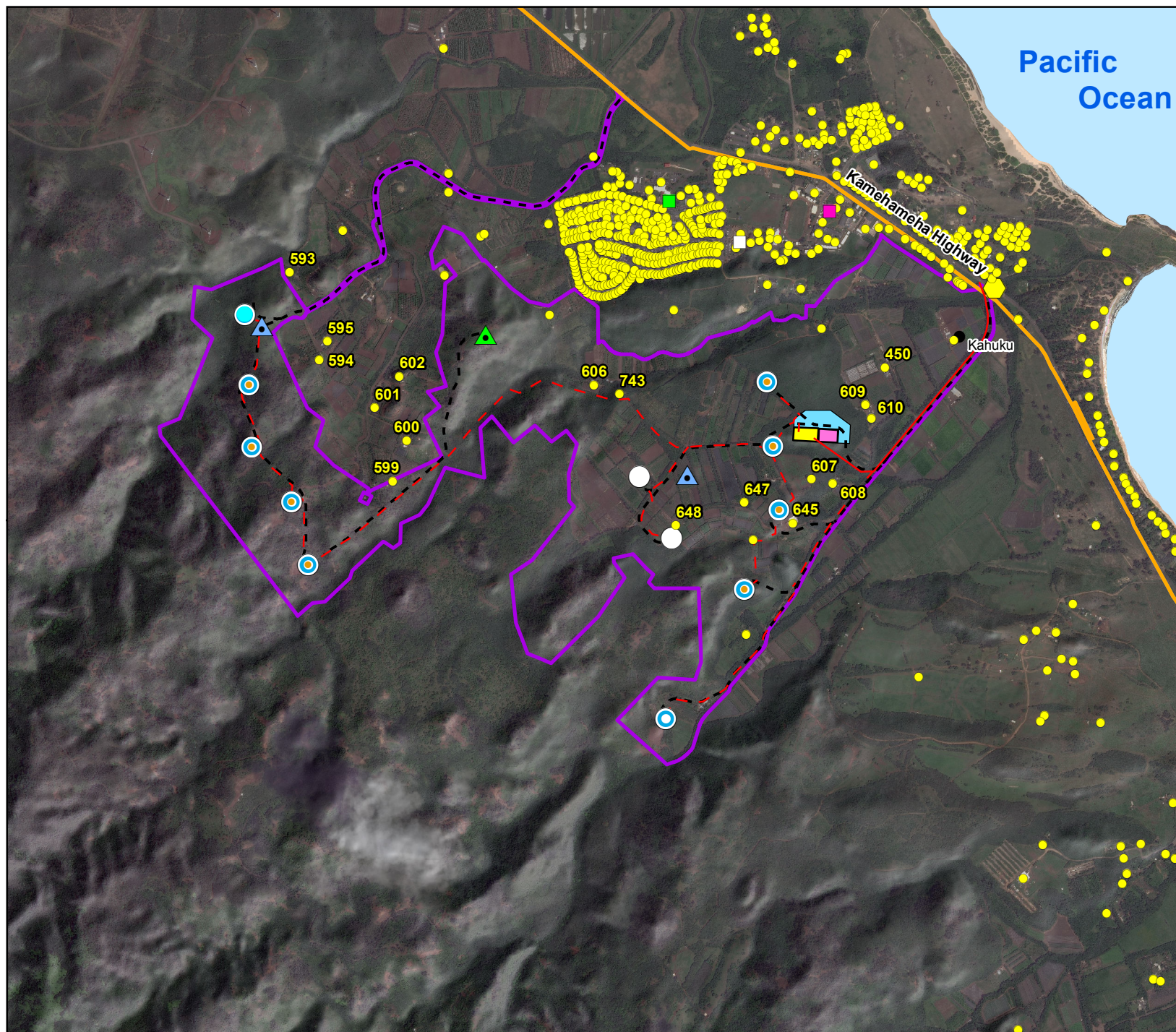


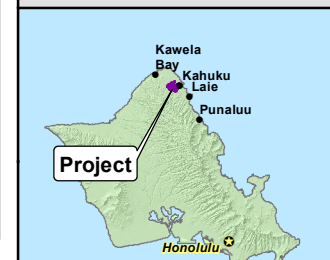
Figure 2

**Na Pua Makani
Wind Project**

**Wind Turbine and
Receptor Locations**

Oahu, HI
December 2015

- Wind Farm Site
- Sensitive Receptor
- Kahuku Elementary School
- Kahuku High School
- Kahuku Medical Center
- Permanent Met Tower
- Temporary Met Tower
- Alt 2a Potential Turbine Loc.
- Alt 2 Potential Turbine Loc.
- Alt 3 Potential Turbine Loc.
- Line Tap Location
- Collector Substation and Point of Interconnect
- Laydown Area
- O&M Facility
- Transmission Line
- Collector Line
- Access Road
- City/Town
- State Highway



1:22,000 WGS 1984 UTM 4

0 0.25 0.5 1 Miles

Data Sources Champlin: project facilities / ESRI: roads / Tetra Tech: shadow flicker isopleths / DigitalGlobe: aerial imagery

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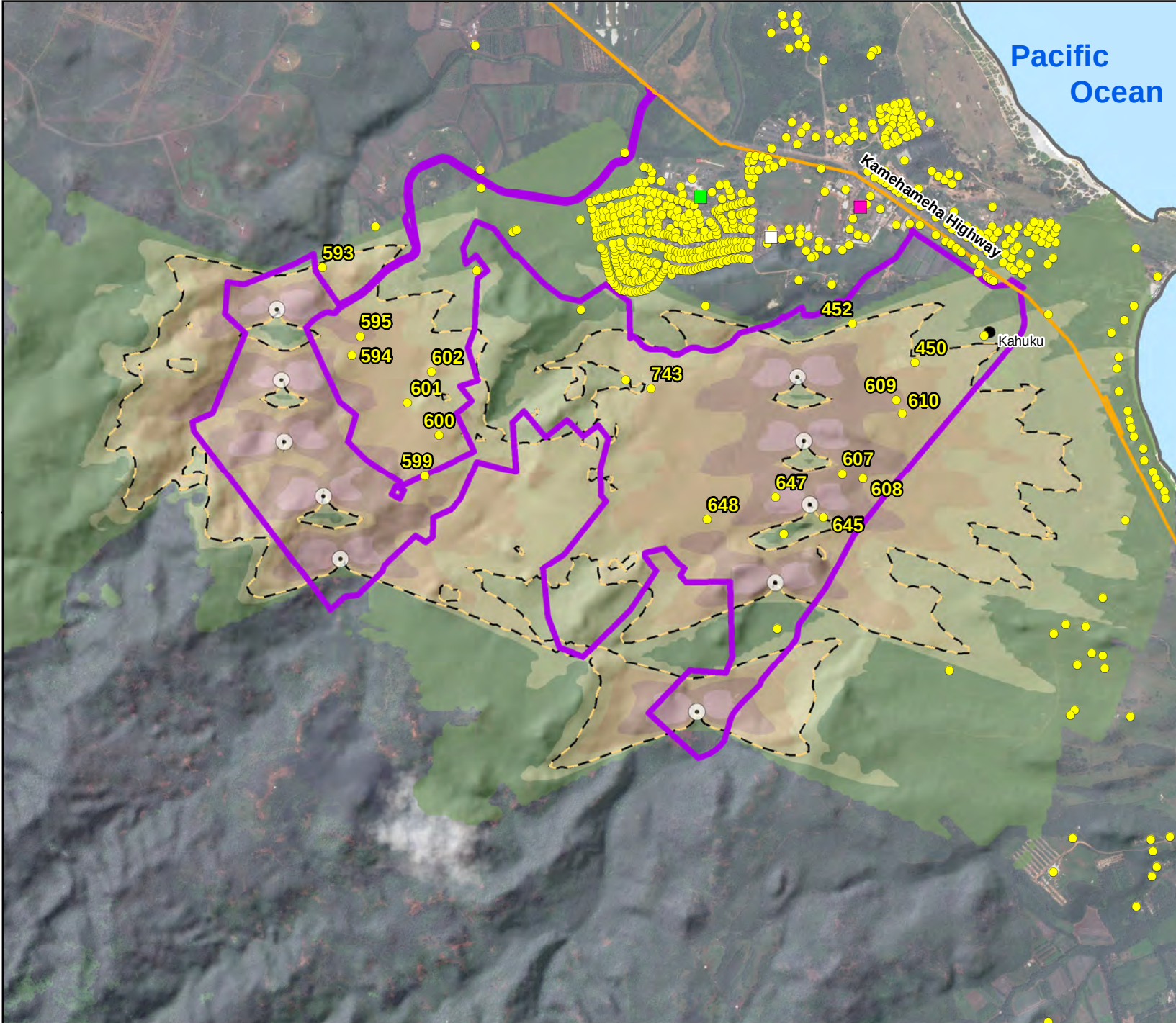
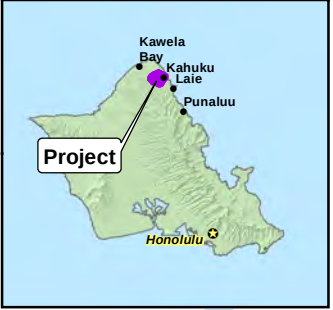


Figure 3
Na Pua Makani Wind Project
WindPro Expected Shadow Flicker Impact Areas
Turbine Alternative 2
Oahu, HI
December 2015

- Sensitive Receptor *
 - Kahuku Elementary School
 - Kahuku High School
 - Kahuku Medical Center
 - Alt 2 Potential Turbine Loc.
 - City/Town
 - State Highway
 - Wind Farm Site
 - Shadow Flicker Boundary (30 hours per year)
- Shadow Flicker (hours per year)
- 0 - 15
 - 15 - 30
 - 30 - 50
 - 50 - 100
 - 100 - 200
 - > 200
- * Only sensitive receptors with greater than 30 hours of shadow flicker per year labeled.



Oahu, HI
December 2015

- * Only sensitive receptors with greater than 30 hours of shadow flicker per year labeled.



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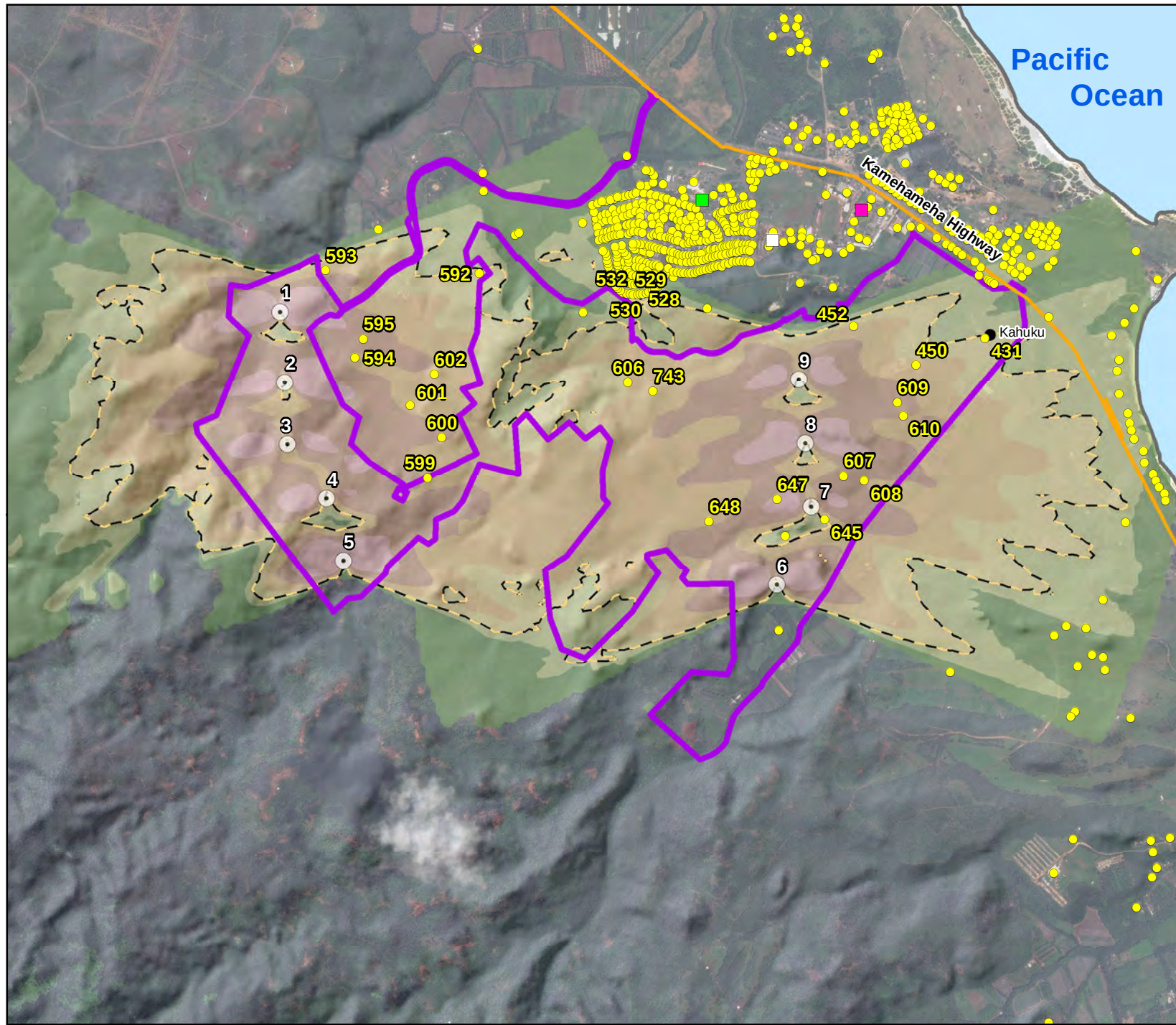


Figure 5

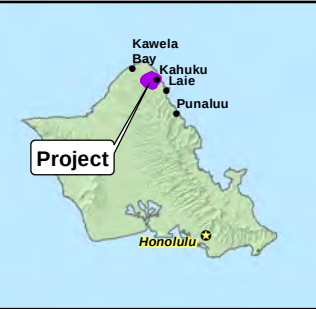
**Na Pua Makani
Wind Project**

WindPro Expected Shadow
Flicker Impact Areas
Turbine Alternative 2a

Oahu, HI
December 2015

- Sensitive Receptor *
- Kahuku Elementary School
- Kahuku High School
- Kahuku Medical Center
- Alt 2a Potential Turbine Loc.
- City/Town
- State Highway
- ▭ Wind Farm Site
- - - Shadow Flicker Boundary (30 hours per year)
- Shadow Flicker (hours per year)
 - 0 - 15
 - 15 - 30
 - 30 - 50
 - 50 - 100
 - 100 - 200
 - > 200

* Only sensitive receptors with greater than 30 hours of shadow flicker per year labeled.



1:22,000 WGS 1984 UTM 4 0 0.25 0.5 1 Miles

Data Sources Champlin: project facilities / ESRI: roads / Tetra Tech: shadow flicker isopleths / DigitalGlobe: aerial imagery

ATTACHMENT A.

Detailed Summary of WindPro Shadow Flicker Analysis Results

Na Pua Makani Energy Wind Project WindPro Shadow Flicker Analysis Results Summary

Turbine Alternative 3

Receptor ID	UTM-E (m)	UTM-N (m)	WindPro Predicted Expected Shadow Flicker (Hours per Year)
1	607,176	2,399,049	0:00:00
2	606,746	2,398,890	0:00:00
3	606,799	2,398,858	0:00:00
4	606,842	2,398,805	0:00:00
5	606,658	2,398,901	0:00:00
6	604,655	2,398,661	0:00:00
7	604,645	2,398,491	0:00:00
8	607,253	2,398,382	0:00:00
9	607,199	2,398,126	0:00:00
10	607,636	2,398,333	0:00:00
11	607,593	2,398,333	0:00:00
12	607,512	2,398,229	0:00:00
13	608,083	2,398,265	0:00:00
14	608,168	2,398,224	0:00:00
15	608,939	2,397,915	0:00:00
16	608,922	2,397,913	0:00:00
17	608,912	2,397,893	0:00:00
18	608,841	2,397,626	0:00:00
19	608,918	2,397,620	0:00:00
20	608,957	2,397,631	0:00:00
21	608,950	2,397,656	0:00:00
22	608,952	2,397,678	0:00:00
23	608,976	2,397,685	0:00:00
24	608,995	2,397,674	0:00:00
25	608,983	2,397,640	0:00:00
26	609,005	2,397,639	0:00:00
27	608,998	2,397,612	0:00:00
28	609,035	2,397,614	0:00:00
29	609,058	2,397,622	0:00:00
30	609,077	2,397,645	0:00:00
31	609,083	2,397,622	0:00:00
32	609,093	2,397,602	0:00:00
33	609,058	2,397,596	0:00:00
34	609,038	2,397,593	0:00:00
35	608,984	2,397,593	0:00:00
36	609,039	2,397,639	0:00:00
37	609,043	2,397,666	0:00:00
38	609,069	2,397,663	0:00:00
39	609,059	2,397,685	0:00:00
40	609,053	2,397,703	0:00:00
41	609,027	2,397,699	0:00:00
42	609,007	2,397,695	0:00:00
43	609,015	2,397,668	0:00:00
44	609,150	2,397,622	0:00:00
45	609,119	2,397,651	0:00:00
46	608,720	2,397,875	0:00:00
47	608,594	2,397,624	0:00:00

Receptor ID	UTM-E (m)	UTM-N (m)	WindPro Predicted Expected Shadow Flicker (Hours per Year)
48	608,652	2,397,607	0:00:00
49	608,798	2,397,682	0:00:00
50	608,615	2,398,057	0:00:00
51	608,509	2,397,984	0:00:00
52	608,562	2,398,018	0:00:00
53	608,555	2,398,058	0:00:00
54	608,604	2,398,024	0:00:00
55	608,619	2,397,995	0:00:00
56	608,647	2,397,960	0:00:00
57	608,651	2,397,927	0:00:00
58	608,622	2,397,938	0:00:00
59	608,582	2,397,923	0:00:00
60	607,315	2,397,935	0:00:00
61	604,622	2,397,929	0:00:00
62	606,910	2,397,202	0:00:00
63	607,335	2,397,430	0:00:00
64	607,465	2,397,178	0:00:00
65	607,479	2,397,188	4:44:00
66	607,739	2,397,228	13:31:00
67	607,336	2,397,356	0:00:00
68	607,918	2,397,499	6:01:00
69	607,995	2,397,440	3:59:00
70	608,013	2,397,439	3:52:00
71	608,065	2,397,384	3:21:00
72	607,973	2,397,379	7:48:00
73	608,000	2,397,377	8:37:00
74	608,025	2,397,391	3:36:00
75	608,028	2,397,420	3:39:00
76	608,190	2,397,397	2:50:00
77	608,143	2,397,364	2:56:00
78	608,207	2,397,343	2:42:00
79	608,153	2,397,330	2:53:00
80	607,891	2,397,180	8:46:00
81	607,883	2,397,210	9:34:00
82	607,870	2,397,204	9:45:00
83	607,879	2,397,178	8:59:00
84	607,868	2,397,176	9:11:00
85	607,856	2,397,174	9:25:00
86	607,843	2,397,170	9:30:00
87	607,833	2,397,166	9:42:00
88	607,820	2,397,165	10:02:00
89	607,804	2,397,157	10:15:00
90	607,802	2,397,185	11:15:00
91	607,824	2,397,190	10:34:00
92	607,839	2,397,193	10:20:00
93	607,855	2,397,196	9:55:00
94	607,798	2,397,209	13:31:00
95	607,794	2,397,227	13:44:00
96	607,817	2,397,233	13:23:00
97	607,833	2,397,239	13:11:00
98	607,856	2,397,240	12:40:00
99	607,875	2,397,242	12:07:00
100	607,872	2,397,264	12:33:00

Receptor ID	UTM-E (m)	UTM-N (m)	WindPro Predicted Expected Shadow Flicker (Hours per Year)
101	607,862	2,397,283	11:51:00
102	607,847	2,397,266	12:33:00
103	607,832	2,397,266	12:21:00
104	607,816	2,397,257	12:45:00
105	607,793	2,397,248	12:59:00
106	607,783	2,397,274	11:02:00
107	607,778	2,397,301	8:28:00
108	607,800	2,397,309	8:29:00
109	607,817	2,397,315	8:30:00
110	607,833	2,397,317	8:51:00
111	607,850	2,397,323	8:46:00
112	607,865	2,397,326	8:59:00
113	607,880	2,397,332	8:49:00
114	607,897	2,397,332	9:26:00
115	607,910	2,397,336	9:22:00
116	607,926	2,397,342	9:16:00
117	607,942	2,397,343	9:37:00
118	607,957	2,397,349	9:33:00
119	607,987	2,397,346	10:05:00
120	608,014	2,397,343	10:25:00
121	608,036	2,397,339	10:25:00
122	608,062	2,397,329	3:15:00
123	608,082	2,397,325	3:08:00
124	608,104	2,397,317	3:06:00
125	608,133	2,397,307	2:54:00
126	608,154	2,397,303	2:50:00
127	608,176	2,397,293	2:44:00
128	608,198	2,397,289	2:39:00
129	607,923	2,397,182	8:13:00
130	607,934	2,397,190	8:11:00
131	607,946	2,397,193	7:59:00
132	607,965	2,397,192	7:43:00
133	607,981	2,397,188	7:22:00
134	607,987	2,397,219	7:43:00
135	607,968	2,397,228	8:15:00
136	607,948	2,397,221	8:32:00
137	607,930	2,397,221	8:47:00
138	607,915	2,397,217	9:06:00
139	607,972	2,397,251	8:35:00
140	607,971	2,397,270	9:25:00
141	607,903	2,397,255	11:39:00
142	607,922	2,397,262	11:18:00
143	607,932	2,397,265	10:56:00
144	607,953	2,397,273	10:27:00
145	607,956	2,397,305	11:22:00
146	607,931	2,397,293	11:33:00
147	607,909	2,397,289	11:52:00
148	607,894	2,397,282	12:03:00
149	607,981	2,397,308	11:01:00
150	607,987	2,397,293	10:30:00
151	608,016	2,397,177	6:57:00
152	608,028	2,397,181	6:47:00
153	608,040	2,397,178	6:42:00

Receptor ID	UTM-E (m)	UTM-N (m)	WindPro Predicted Expected Shadow Flicker (Hours per Year)
154	608,055	2,397,172	6:25:00
155	608,050	2,397,196	6:39:00
156	608,054	2,397,231	6:56:00
157	608,044	2,397,254	7:23:00
158	608,022	2,397,222	7:10:00
159	608,012	2,397,288	8:55:00
160	608,016	2,397,309	10:19:00
161	608,049	2,397,301	8:18:00
162	608,028	2,397,284	8:16:00
163	608,018	2,397,248	7:39:00
164	608,131	2,397,268	2:53:00
165	608,139	2,397,236	2:47:00
166	608,131	2,397,214	2:50:00
167	608,122	2,397,239	2:55:00
168	608,103	2,397,250	3:00:00
169	608,110	2,397,278	3:00:00
170	608,085	2,397,286	3:05:00
171	608,069	2,397,266	7:08:00
172	608,069	2,397,248	6:54:00
173	608,049	2,397,212	6:45:00
174	608,102	2,397,195	6:08:00
175	608,096	2,397,183	6:09:00
176	608,076	2,397,168	6:15:00
177	608,093	2,397,167	6:03:00
178	608,102	2,397,164	6:00:00
179	608,113	2,397,158	5:57:00
180	608,124	2,397,155	2:52:00
181	608,124	2,397,178	2:50:00
182	608,148	2,397,144	2:46:00
183	608,167	2,397,147	2:45:00
184	608,176	2,397,152	2:39:00
185	608,190	2,397,153	2:38:00
186	608,202	2,397,157	2:35:00
187	608,216	2,397,157	2:33:00
188	608,194	2,397,174	2:35:00
189	608,167	2,397,170	2:42:00
190	608,169	2,397,184	2:41:00
191	608,194	2,397,196	2:36:00
192	608,221	2,397,211	2:29:00
193	608,219	2,397,233	2:31:00
194	608,211	2,397,254	2:36:00
195	608,191	2,397,233	2:38:00
196	608,194	2,397,214	2:34:00
197	608,169	2,397,204	2:41:00
198	608,153	2,397,209	2:47:00
199	608,159	2,397,240	2:44:00
200	608,178	2,397,256	2:39:00
201	607,821	2,397,116	4:24:00
202	607,870	2,397,131	4:06:00
203	607,897	2,397,137	8:10:00
204	607,973	2,397,141	7:14:00
205	607,957	2,397,145	7:29:00
206	607,942	2,397,145	7:41:00

Receptor ID	UTM-E (m)	UTM-N (m)	WindPro Predicted Expected Shadow Flicker (Hours per Year)
207	607,942	2,397,131	7:32:00
208	607,952	2,397,120	7:21:00
209	607,973	2,397,116	7:09:00
210	607,985	2,397,115	6:57:00
211	607,998	2,397,108	6:46:00
212	608,012	2,397,105	6:37:00
213	608,071	2,397,116	6:05:00
214	608,057	2,397,120	6:14:00
215	608,044	2,397,125	6:25:00
216	608,032	2,397,128	6:33:00
217	608,022	2,397,131	6:36:00
218	608,009	2,397,135	6:49:00
219	607,996	2,397,135	6:54:00
220	607,985	2,397,141	7:06:00
221	608,096	2,397,111	5:58:00
222	608,108	2,397,107	5:50:00
223	608,124	2,397,102	5:42:00
224	608,239	2,397,158	2:29:00
225	608,253	2,397,162	2:26:00
226	608,267	2,397,168	0:00:00
227	608,290	2,397,166	0:00:00
228	608,289	2,397,180	0:00:00
229	608,280	2,397,196	0:00:00
230	608,272	2,397,207	0:00:00
231	608,263	2,397,219	0:00:00
232	608,239	2,397,182	2:32:00
233	608,282	2,397,262	0:00:00
234	608,294	2,397,251	0:00:00
235	608,302	2,397,242	0:00:00
236	608,309	2,397,232	0:00:00
237	608,317	2,397,221	0:00:00
238	608,325	2,397,205	0:00:00
239	608,332	2,397,190	0:00:00
240	608,354	2,397,191	0:00:00
241	608,368	2,397,194	0:00:00
242	608,381	2,397,195	0:00:00
243	608,393	2,397,193	0:00:00
244	608,408	2,397,193	0:00:00
245	608,426	2,397,187	0:00:00
246	608,357	2,397,209	0:00:00
247	608,353	2,397,228	0:00:00
248	608,350	2,397,247	0:00:00
249	608,383	2,397,248	0:00:00
250	608,397	2,397,250	0:00:00
251	608,411	2,397,255	0:00:00
252	608,423	2,397,258	0:00:00
253	608,436	2,397,260	0:00:00
254	608,408	2,397,229	0:00:00
255	608,427	2,397,233	0:00:00
256	608,300	2,397,268	0:00:00
257	608,306	2,397,273	0:00:00
258	608,330	2,397,281	0:00:00
259	608,346	2,397,284	0:00:00

Receptor ID	UTM-E (m)	UTM-N (m)	WindPro Predicted Expected Shadow Flicker (Hours per Year)
260	608,354	2,397,286	0:00:00
261	608,366	2,397,289	0:00:00
262	608,378	2,397,293	0:00:00
263	608,390	2,397,297	0:00:00
264	608,400	2,397,301	0:00:00
265	608,413	2,397,301	0:00:00
266	608,426	2,397,305	0:00:00
267	608,270	2,397,341	0:00:00
268	608,311	2,397,313	0:00:00
269	608,348	2,397,323	0:00:00
270	608,341	2,397,346	0:00:00
271	608,327	2,397,370	0:00:00
272	608,302	2,397,368	0:00:00
273	608,391	2,397,335	0:00:00
274	608,235	2,397,107	2:30:00
275	608,246	2,397,112	2:28:00
276	608,256	2,397,118	2:25:00
277	608,270	2,397,119	0:00:00
278	608,278	2,397,122	0:00:00
279	608,294	2,397,124	0:00:00
280	608,305	2,397,131	0:00:00
281	608,316	2,397,131	0:00:00
282	608,325	2,397,136	0:00:00
283	608,337	2,397,137	0:00:00
284	608,352	2,397,139	0:00:00
285	608,361	2,397,141	0:00:00
286	608,371	2,397,141	0:00:00
287	608,389	2,397,139	0:00:00
288	608,402	2,397,139	0:00:00
289	608,415	2,397,140	0:00:00
290	608,428	2,397,138	0:00:00
291	608,508	2,397,151	0:00:00
292	608,511	2,397,189	0:00:00
293	608,493	2,397,131	0:00:00
294	608,425	2,397,485	0:00:00
295	608,417	2,397,464	0:00:00
296	608,437	2,397,466	0:00:00
297	608,446	2,397,485	0:00:00
298	608,474	2,397,481	0:00:00
299	608,497	2,397,475	0:00:00
300	608,503	2,397,453	0:00:00
301	608,496	2,397,436	0:00:00
302	608,521	2,397,445	0:00:00
303	608,556	2,397,461	0:00:00
304	608,429	2,397,370	0:00:00
305	608,441	2,397,398	0:00:00
306	608,419	2,397,403	0:00:00
307	608,419	2,397,428	0:00:00
308	608,436	2,397,428	0:00:00
309	608,457	2,397,429	0:00:00
310	608,631	2,397,581	0:00:00
311	608,570	2,397,562	0:00:00
312	608,512	2,397,517	0:00:00

Receptor ID	UTM-E (m)	UTM-N (m)	WindPro Predicted Expected Shadow Flicker (Hours per Year)
313	608,614	2,397,534	0:00:00
314	608,688	2,397,564	0:00:00
315	608,552	2,397,151	0:00:00
316	608,587	2,397,161	0:00:00
317	608,581	2,397,192	0:00:00
318	608,630	2,397,192	0:00:00
319	608,628	2,397,170	0:00:00
320	608,622	2,397,137	0:00:00
321	608,661	2,397,166	0:00:00
322	608,702	2,397,118	0:00:00
323	608,704	2,397,143	0:00:00
324	608,726	2,397,343	0:00:00
325	608,711	2,397,436	0:00:00
326	608,972	2,397,575	0:00:00
327	608,969	2,397,556	0:00:00
328	608,977	2,397,531	0:00:00
329	609,004	2,397,540	0:00:00
330	609,023	2,397,549	0:00:00
331	609,009	2,397,567	0:00:00
332	609,101	2,397,582	0:00:00
333	609,075	2,397,572	0:00:00
334	609,055	2,397,564	0:00:00
335	609,048	2,397,469	0:00:00
336	609,114	2,397,284	0:00:00
337	609,091	2,397,303	0:00:00
338	609,105	2,397,353	0:00:00
339	609,069	2,397,313	0:00:00
340	609,050	2,397,332	0:00:00
341	609,026	2,397,340	0:00:00
342	609,010	2,397,352	0:00:00
343	608,990	2,397,366	0:00:00
344	608,972	2,397,378	0:00:00
345	608,952	2,397,393	0:00:00
346	608,928	2,397,399	0:00:00
347	608,968	2,397,427	0:00:00
348	608,923	2,397,596	0:00:00
349	608,846	2,397,590	0:00:00
350	608,849	2,397,569	0:00:00
351	608,805	2,397,563	0:00:00
352	608,827	2,397,548	0:00:00
353	608,778	2,397,551	0:00:00
354	608,897	2,397,480	0:00:00
355	608,878	2,397,567	0:00:00
356	608,747	2,397,575	0:00:00
357	608,899	2,397,424	0:00:00
358	608,826	2,397,191	0:00:00
359	608,840	2,397,235	0:00:00
360	608,870	2,397,274	0:00:00
361	608,896	2,397,291	0:00:00
362	608,950	2,397,274	0:00:00
363	608,810	2,397,352	0:00:00
364	608,911	2,397,326	0:00:00
365	609,014	2,397,209	0:00:00

Receptor ID	UTM-E (m)	UTM-N (m)	WindPro Predicted Expected Shadow Flicker (Hours per Year)
366	609,069	2,397,213	0:00:00
367	608,861	2,397,168	0:00:00
368	608,892	2,397,155	0:00:00
369	608,796	2,397,108	0:00:00
370	608,825	2,397,128	0:00:00
371	609,109	2,397,209	0:00:00
372	609,175	2,397,168	0:00:00
373	609,214	2,397,142	0:00:00
374	609,236	2,397,129	0:00:00
375	609,257	2,397,114	0:00:00
376	609,358	2,397,122	0:00:00
377	609,339	2,397,134	0:00:00
378	609,300	2,397,159	0:00:00
379	609,282	2,397,172	0:00:00
380	609,261	2,397,186	0:00:00
381	609,240	2,397,194	0:00:00
382	609,221	2,397,211	0:00:00
383	609,175	2,397,239	0:00:00
384	609,248	2,397,262	0:00:00
385	609,158	2,397,426	0:00:00
386	609,185	2,397,405	0:00:00
387	609,210	2,397,389	0:00:00
388	609,229	2,397,416	0:00:00
389	609,267	2,397,407	0:00:00
390	609,240	2,397,375	0:00:00
391	609,404	2,397,283	0:00:00
392	609,383	2,397,100	0:00:00
393	609,398	2,397,129	0:00:00
394	609,409	2,397,157	0:00:00
395	609,424	2,397,180	0:00:00
396	609,402	2,397,202	0:00:00
397	609,386	2,397,177	0:00:00
398	609,373	2,397,153	0:00:00
399	609,333	2,397,186	0:00:00
400	609,354	2,397,170	0:00:00
401	609,302	2,397,204	0:00:00
402	609,491	2,397,105	0:00:00
403	609,505	2,397,123	0:00:00
404	609,476	2,397,149	0:00:00
405	609,457	2,397,128	0:00:00
406	609,466	2,397,191	0:00:00
407	609,494	2,397,175	0:00:00
408	609,599	2,397,139	0:00:00
409	609,575	2,397,157	0:00:00
410	609,546	2,397,178	0:00:00
411	609,506	2,397,204	0:00:00
412	609,572	2,397,221	0:00:00
413	609,559	2,397,200	0:00:00
414	609,583	2,397,188	0:00:00
415	609,597	2,397,213	0:00:00
416	609,637	2,397,218	0:00:00
417	609,663	2,397,196	0:00:00
418	609,655	2,397,177	0:00:00

Receptor ID	UTM-E (m)	UTM-N (m)	WindPro Predicted Expected Shadow Flicker (Hours per Year)
419	609,623	2,397,196	0:00:00
420	609,609	2,397,172	0:00:00
421	609,636	2,397,156	0:00:00
422	609,660	2,397,138	0:00:00
423	609,626	2,397,131	0:00:00
424	609,984	2,397,115	9:07:00
425	610,071	2,396,998	4:48:00
426	609,976	2,396,880	13:59:00
427	609,885	2,396,770	19:36:00
428	609,937	2,396,822	16:23:00
429	609,914	2,396,671	20:20:00
430	609,629	2,396,844	10:27:00
431	609,370	2,396,760	24:31:00
432	609,330	2,397,070	0:00:00
433	609,353	2,397,048	0:00:00
434	609,346	2,397,014	0:00:00
435	609,382	2,396,998	0:00:00
436	609,388	2,396,991	0:00:00
437	609,396	2,396,987	0:00:00
438	609,407	2,396,981	0:00:00
439	609,446	2,397,055	0:00:00
440	609,474	2,397,039	0:00:00
441	609,492	2,397,024	0:00:00
442	609,522	2,397,010	5:48:00
443	609,543	2,397,033	2:35:00
444	609,516	2,397,050	0:00:00
445	609,454	2,397,092	0:00:00
446	609,480	2,397,074	0:00:00
447	609,556	2,397,093	0:00:00
448	609,648	2,397,073	4:08:00
449	609,628	2,397,049	7:03:00
450	609,092	2,396,651	69:22:00
451	609,278	2,397,098	0:00:00
452	608,838	2,396,807	0:00:00
453	608,620	2,396,984	0:00:00
454	608,753	2,396,967	0:00:00
455	608,733	2,397,108	0:00:00
456	608,685	2,397,083	0:00:00
457	608,671	2,397,078	0:00:00
458	608,649	2,397,105	0:00:00
459	608,134	2,397,097	5:33:00
460	608,147	2,397,097	2:47:00
461	608,159	2,397,096	2:44:00
462	608,172	2,397,096	2:42:00
463	608,185	2,397,096	2:37:00
464	608,196	2,397,097	2:37:00
465	608,210	2,397,102	2:35:00
466	608,220	2,397,104	2:33:00
467	608,093	2,397,084	5:57:00
468	608,104	2,397,080	5:49:00
469	608,123	2,397,075	5:40:00
470	608,142	2,397,071	5:29:00
471	608,162	2,397,068	2:43:00

Receptor ID	UTM-E (m)	UTM-N (m)	WindPro Predicted Expected Shadow Flicker (Hours per Year)
472	608,180	2,397,070	2:39:00
473	608,194	2,397,074	2:38:00
474	608,206	2,397,074	2:35:00
475	608,224	2,397,080	2:31:00
476	608,242	2,397,085	2:27:00
477	608,251	2,397,088	2:25:00
478	608,265	2,397,091	0:00:00
479	608,277	2,397,096	0:00:00
480	608,289	2,397,098	0:00:00
481	608,304	2,397,100	0:00:00
482	608,319	2,397,104	0:00:00
483	608,339	2,397,108	0:00:00
484	608,348	2,397,111	0:00:00
485	608,362	2,397,112	0:00:00
486	608,375	2,397,115	0:00:00
487	608,390	2,397,116	0:00:00
488	608,403	2,397,114	0:00:00
489	608,417	2,397,113	0:00:00
490	608,007	2,396,948	17:43:00
491	608,021	2,396,958	15:43:00
492	608,031	2,396,963	14:07:00
493	608,042	2,396,971	3:23:00
494	608,050	2,396,983	3:19:00
495	608,059	2,396,995	3:14:00
496	608,069	2,397,008	3:11:00
497	608,076	2,397,020	3:08:00
498	608,082	2,397,030	3:03:00
499	608,085	2,397,044	3:02:00
500	608,107	2,397,029	3:01:00
501	608,107	2,397,006	3:01:00
502	608,122	2,397,028	2:55:00
503	608,137	2,397,025	2:52:00
504	608,151	2,397,026	2:47:00
505	608,167	2,397,024	2:47:00
506	608,179	2,397,024	2:44:00
507	608,193	2,397,025	2:36:00
508	608,205	2,397,029	2:39:00
509	608,215	2,397,032	2:39:00
510	608,229	2,397,034	2:35:00
511	608,239	2,397,038	2:29:00
512	608,254	2,397,041	2:27:00
513	608,264	2,397,046	2:25:00
514	608,275	2,397,049	0:00:00
515	608,288	2,397,053	0:00:00
516	608,304	2,397,050	0:00:00
517	608,315	2,397,061	0:00:00
518	608,332	2,397,061	0:00:00
519	608,347	2,397,068	0:00:00
520	608,362	2,397,071	0:00:00
521	608,376	2,397,072	0:00:00
522	608,393	2,397,071	0:00:00
523	608,405	2,397,071	0:00:00
524	608,418	2,397,069	0:00:00

Receptor ID	UTM-E (m)	UTM-N (m)	WindPro Predicted Expected Shadow Flicker (Hours per Year)
525	608,243	2,396,881	12:32:00
526	607,997	2,396,944	18:22:00
527	607,983	2,396,940	18:57:00
528	607,971	2,396,938	19:00:00
529	607,962	2,396,936	18:57:00
530	607,944	2,396,936	18:44:00
531	607,933	2,396,938	18:33:00
532	607,917	2,396,940	18:06:00
533	607,902	2,396,944	17:36:00
534	607,892	2,396,952	17:25:00
535	607,881	2,396,963	17:08:00
536	607,872	2,396,971	16:52:00
537	607,862	2,396,984	16:25:00
538	607,860	2,396,998	15:52:00
539	607,852	2,397,017	14:39:00
540	607,848	2,397,035	13:17:00
541	607,844	2,397,050	11:58:00
542	607,841	2,397,064	10:18:00
543	607,838	2,397,076	8:46:00
544	607,835	2,397,095	6:05:00
545	607,832	2,397,107	4:22:00
546	607,875	2,397,115	4:04:00
547	607,878	2,397,103	4:03:00
548	607,878	2,397,088	4:03:00
549	607,880	2,397,069	10:25:00
550	607,883	2,397,057	12:00:00
551	607,887	2,397,043	9:54:00
552	607,889	2,397,029	12:08:00
553	607,895	2,397,014	13:47:00
554	607,903	2,396,999	14:59:00
555	607,913	2,396,988	15:47:00
556	607,924	2,396,982	16:05:00
557	607,939	2,396,979	16:08:00
558	607,952	2,396,979	15:47:00
559	607,963	2,396,982	14:52:00
560	607,977	2,396,983	13:57:00
561	607,989	2,396,987	12:28:00
562	608,001	2,396,992	10:33:00
563	608,012	2,397,000	7:56:00
564	608,022	2,397,007	5:29:00
565	608,030	2,397,019	3:17:00
566	608,038	2,397,028	3:15:00
567	607,897	2,397,124	3:56:00
568	607,906	2,397,108	7:56:00
569	607,917	2,397,096	7:43:00
570	607,924	2,397,084	7:32:00
571	607,909	2,397,072	7:40:00
572	607,926	2,397,069	7:32:00
573	607,913	2,397,051	6:29:00
574	607,919	2,397,038	8:20:00
575	607,927	2,397,026	9:56:00
576	607,940	2,397,016	10:43:00
577	607,956	2,397,012	10:14:00

Receptor ID	UTM-E (m)	UTM-N (m)	WindPro Predicted Expected Shadow Flicker (Hours per Year)
578	607,956	2,397,077	7:15:00
579	607,969	2,397,075	7:05:00
580	607,982	2,397,069	6:53:00
581	607,999	2,397,065	6:44:00
582	608,010	2,397,059	6:38:00
583	608,026	2,397,058	6:25:00
584	608,038	2,397,057	6:23:00
585	608,049	2,397,051	6:15:00
586	607,954	2,397,051	7:06:00
587	607,969	2,397,047	7:02:00
588	607,983	2,397,044	3:31:00
589	608,002	2,397,033	3:26:00
590	608,000	2,397,020	4:43:00
591	607,741	2,396,863	9:24:00
592	607,319	2,397,021	25:00:00
593	606,695	2,397,034	48:35:00
594	606,815	2,396,680	73:02:00
595	606,848	2,396,756	117:35:00
597	605,003	2,396,363	0:00:00
598	604,988	2,396,317	0:00:00
599	607,110	2,396,193	74:33:00
600	607,166	2,396,356	99:18:00
601	607,038	2,396,488	57:31:00
602	607,137	2,396,614	66:02:00
606	607,921	2,396,580	21:14:00
607	608,797	2,396,201	161:37:00
608	608,881	2,396,182	133:20:00
609	609,014	2,396,499	153:57:00
610	609,038	2,396,445	176:45:00
611	609,906	2,396,627	18:36:00
612	609,914	2,396,533	17:14:00
613	609,957	2,396,417	15:32:00
614	609,949	2,396,456	15:47:00
615	609,964	2,396,387	15:26:00
616	609,975	2,396,351	15:25:00
617	610,013	2,396,303	14:43:00
618	610,016	2,396,254	14:58:00
619	610,063	2,396,182	14:11:00
620	610,053	2,396,207	14:09:00
621	610,609	2,395,774	0:00:00
622	610,597	2,395,775	0:00:00
623	610,574	2,395,777	0:00:00
624	610,457	2,395,755	0:00:00
625	610,479	2,395,821	0:00:00
626	610,506	2,395,807	0:00:00
627	610,544	2,395,798	0:00:00
628	610,214	2,396,012	3:49:00
629	610,223	2,395,981	3:57:00
630	610,261	2,395,960	3:44:00
631	610,263	2,395,909	3:39:00
632	610,345	2,395,901	0:00:00
633	610,359	2,395,857	0:00:00
634	610,376	2,395,848	0:00:00

Receptor ID	UTM-E (m)	UTM-N (m)	WindPro Predicted Expected Shadow Flicker (Hours per Year)
635	610,391	2,395,840	0:00:00
636	610,167	2,396,054	4:14:00
637	610,191	2,396,030	4:02:00
638	610,077	2,396,156	14:06:00
639	610,098	2,396,130	13:39:00
640	610,103	2,396,102	14:21:00
641	609,941	2,396,013	20:10:00
642	609,849	2,395,699	11:56:00
645	608,721	2,396,023	108:01:00
646	608,561	2,395,956	64:58:00
647	608,527	2,396,107	411:55:00
648	608,251	2,396,015	307:25:00
649	608,534	2,395,574	0:00:00
650	609,229	2,395,405	6:33:00
651	609,781	2,395,584	11:26:00
652	609,804	2,395,476	5:03:00
653	609,850	2,395,467	4:34:00
654	609,857	2,395,415	4:57:00
655	609,747	2,395,430	6:11:00
656	609,701	2,395,591	8:37:00
657	609,652	2,395,554	6:09:00
658	610,560	2,395,693	0:00:00
659	610,768	2,394,779	0:00:00
660	610,746	2,394,763	0:00:00
661	610,793	2,394,760	0:00:00
662	610,584	2,395,156	0:00:00
663	610,547	2,395,134	0:00:00
664	610,573	2,395,126	0:00:00
665	610,584	2,395,101	0:00:00
666	610,676	2,394,967	0:00:00
667	610,640	2,394,959	0:00:00
668	610,617	2,394,959	0:00:00
669	610,595	2,394,986	0:00:00
670	610,298	2,394,900	0:00:00
671	610,253	2,394,896	0:00:00
672	609,961	2,395,220	0:00:00
673	609,719	2,395,226	5:02:00
674	609,735	2,395,247	7:56:00
675	609,650	2,394,592	0:00:00
676	609,728	2,394,729	0:00:00
677	610,042	2,394,722	0:00:00
678	610,122	2,394,732	0:00:00
679	610,053	2,394,675	0:00:00
680	610,067	2,394,611	0:00:00
681	609,985	2,394,452	0:00:00
682	610,048	2,394,572	0:00:00
683	610,260	2,394,673	0:00:00
684	610,223	2,394,691	0:00:00
685	610,514	2,394,718	0:00:00
686	610,548	2,394,725	0:00:00
687	610,598	2,394,739	0:00:00
688	610,815	2,394,732	0:00:00
689	610,823	2,394,712	0:00:00

Receptor ID	UTM-E (m)	UTM-N (m)	WindPro Predicted Expected Shadow Flicker (Hours per Year)
690	610,799	2,394,689	0:00:00
691	610,781	2,394,704	0:00:00
692	610,760	2,394,740	0:00:00
693	610,717	2,394,580	0:00:00
694	610,746	2,394,589	0:00:00
695	610,767	2,394,607	0:00:00
696	610,768	2,394,584	0:00:00
697	610,761	2,394,562	0:00:00
698	610,723	2,394,543	0:00:00
699	610,740	2,394,523	0:00:00
700	610,758	2,394,640	0:00:00
701	610,731	2,394,632	0:00:00
702	610,704	2,394,624	0:00:00
703	610,670	2,394,648	0:00:00
704	610,687	2,394,656	0:00:00
705	610,719	2,394,664	0:00:00
706	610,746	2,394,672	0:00:00
707	610,706	2,394,687	0:00:00
708	610,738	2,394,698	0:00:00
709	610,678	2,394,683	0:00:00
710	610,651	2,394,674	0:00:00
711	610,623	2,394,674	0:00:00
712	610,614	2,394,706	0:00:00
713	610,646	2,394,708	0:00:00
714	610,669	2,394,716	0:00:00
715	610,707	2,394,728	0:00:00
716	610,639	2,394,592	0:00:00
717	610,619	2,394,584	0:00:00
718	610,596	2,394,577	0:00:00
719	610,578	2,394,564	0:00:00
720	610,553	2,394,550	0:00:00
721	610,535	2,394,541	0:00:00
722	610,516	2,394,529	0:00:00
723	610,504	2,394,506	0:00:00
724	610,523	2,394,473	0:00:00
725	610,551	2,394,482	0:00:00
726	610,541	2,394,342	0:00:00
727	610,533	2,394,374	0:00:00
728	610,525	2,394,394	0:00:00
729	610,514	2,394,426	0:00:00
730	610,545	2,394,450	0:00:00
731	610,565	2,394,428	0:00:00
732	610,584	2,394,432	0:00:00
733	610,604	2,394,437	0:00:00
734	610,613	2,394,409	0:00:00
735	610,592	2,394,405	0:00:00
736	610,563	2,394,400	0:00:00
737	610,631	2,394,417	0:00:00
738	610,660	2,394,427	0:00:00
739	610,172	2,394,187	0:00:00
740	610,203	2,394,179	0:00:00
741	609,656	2,393,882	0:00:00
742	609,629	2,393,983	0:00:00

Receptor ID	UTM-E (m)	UTM-N (m)	WindPro Predicted Expected Shadow Flicker (Hours per Year)
743	608,022	2,396,545	38:06:00