

January 31, 2023

BY EMAIL ONLY

New Hampshire Site Evaluation Committee (NHSEC)
Attention: Admin, admin@nhsec.nh.gov
21 S. Fruit Street, Suite 10
Concord, NH 03301

Re: Antrim Wind Energy – SCADA Shadow Flicker Semi-Annual Report 2022-H2

Dear Sir/Madam,

TransAlta is pleased to submit the 2022 SCADA Shadow Flicker Semi-Annual Report for the Antrim Wind Energy (AWE) facility. The report is prepared in accordance with the AWE NHSEC Certificate conditions, NHSEC Rule 301.14 (f) (2) b., and the related Antrim Town Agreement.

We trust that you will find this submission satisfactory. Should you require any additional information, please feel free to contact the undersigned.

Yours truly,

TRANSALTA CORPORATION



Gavin MacPhee
Specialist, Environment | Wind & Solar Operations

CC: Ethan Mollasalehi, Supervisor | US Wind & Solar Operations

Encl

Antrim Wind Energy, LLC SCADA Shadow Flicker Semi-Annual Report

January 1, 2022 – December 31, 2022



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1. Introduction and context

This report has been prepared by TransAlta Corporation on the behalf of Antrim Wind Energy, LLC for the Antrim Wind Energy facility (AWE). The facility is located on the Tuttle Hill ridgeline in the Town of Antrim in Hillsborough County, New Hampshire. The facility comprises 9 Siemens-Gamesa Renewable Energy SWT-3.2-113, 3.2 MW. Wind turbine generators at AWE have 113 meter (m) diameter rotors with a hub height of 92.5 m for turbines 1 to 8, and a 79.5 m hub height for turbine 9.

The facility is also equipped with a SCADA¹ system able to record, track and limit the shadow flicker occurring at different receptors in the vicinity of the project. This report contains a description of the system, its year to date (YTD) results along with a comparison with AWE's conditions and obligations regarding shadow flicker control and reporting.

2. Shadow flicker control and reporting requirements

AWE has been approved by the NH Site Evaluation Committee (NHSEC) under several conditions, listed below.

Per NHSEC Rule 102.48, shadow flicker is described as "[...] *the alternating changes in light intensity that can occur when the rotating blades of a wind turbine are backlit by the sun and cast moving shadows on the ground or on structures.*"

Regarding shadow flicker, the facility's Certificate² has the following condition:

"Further Ordered that, on a semi-annual basis, the Applicant shall submit to the Administrator of the Committee and to the Town of Antrim, an electronic copy and one hard copy of the report generated from the SCADA System that shows the amount of shadow flicker for each residence, learning space, workplace, health care setting, outdoor or indoor public gathering area, other occupied building, and roadway, identified by property address and/or tax identification number, within a minimum of one mile of any turbine;"

Also, per NHSEC Rule 301.14 (f) (2) b., "[...] *the shadow flicker created by the applicant's energy facility during operations shall not occur more than 8 hours per year at or within any residence, learning space, workplace, health care setting, outdoor or indoor public gathering area, or other occupied building;*"

The semi-annual reports act to verify that each shadow sensitive receptor has not been subject to an exceedance of eight hours of shadow flicker per year.

¹ Supervisory Control And Data Acquisition

² Docket 2015-15 - Order and Certificate of Site and Facility with Conditions, March 17, 2017, issued by SEC.

3. AWE's Shadow Flicker Control System

The AWE SCADA system has a module called Shadow Flicker Control System (SFCS) that can record, track and limit the shadow flicker occurring at different receptors in the vicinity of the project. This system can manage up to 50 zones of 50 turbines.

The SFCS uses a precise algorithm to establish the sun's angle of elevation from the horizon, as well as its orientation from North to calculate when a shadow flicker event from a turbine may occur in a receptor group (accounting for turbine operation, yaw orientation, etc.). For each receptor group, the SFCS tracks the YTD shadow flicker duration and automatically stops turbines causing shadow flicker outside the permitted eight hour annual duration (and automatically resumes turbine operation once the shadow flicker event has ended). The system is also paired with light detection and ranging (LIDAR) to detect cloud coverage to ensure wind turbines are only paused when sunny conditions are present.

4. Zone receptors definition

Baseline receptor locations were determined using a pre-project shadow flicker assessment³. Notifications of land development from the Town of Antrim and crosschecks with an online geographic information system (GIS)⁴ are then used to establish the current receptor count (152 receptors). Maps A1 and A2 in Appendix A show the location of each receptor along with the parcel boundaries, turbine locations and one mile radius. Of the 152 receptors, only 102 are within one mile of a turbine (Appendix B). Due to the SFCS limitation to 50 zones, most receptors have been aggregated into receptor groups. The perimeter of each group (1 to 50) is shown on map A3. Maps A4 and A5 show the different groups⁵ that may experience shadow flicker from one or more turbines.

It is important to mention that due to the size of some groups, the shadow flicker duration for several receptors and larger receptor groups are aggregated. This conservative approach includes the duration of several different receptors against the same eight hour allowance⁶. Occasional, optimization of the groups may be done to avoid excessive aggregation or improve SFCS efficiency⁷. In the meantime, a factor has been established using WindPro 3.4 software to correlate the relation between the results for each specific receptor and their corresponding group

5. Results

The table in Appendix B shows shadow flicker tracking results for each receptor issued from the SCADA SFCS for the period between 2022-01-01 and 2022-12-31. Each

³ Shadow Flicker Analysis, Epsilon Associates in., revised 2016-02-17.

⁴ <https://www.axisgis.com/AntrimNH/>

⁵ For clarity, the groups that don't experience any shadow flicker aren't shown on map A4 and A5.

⁶ As a group containing larger zone and/or several receptors is limited to an eight hours allowance, any zone or receptors contained inside such group will inevitably be limited to less than eight hours of shadow flicker per year.

⁷ Such optimization has been performed at the beginning of 2021.



receptor is presented with the *Lot number, Parcel ID* and *Location* (including if the receptor is within 1 mile of a turbine and its coordinates). The table also indicates the group receptor in which the individual receptor is located.

The column *YTD Group Shadow flicker occurred* indicates how many hours of shadow flicker occurred at a group/zone during the period when no protection was activated. The column *YTD Group Shadow flicker protection* indicates how many hours one or more turbines were stopped to avoid shadow flicker at a group/zone. The *YTD Receptor Shadow flicker occurred* corresponds to the shadow flicker that occurred at specific receptor considering the correlation between the receptor-group/zone pair (as explained in Section 4 above). The last column indicates if the result for a receptor is below the eight hour allowance.

6. Conclusion

As outlined in Appendix B, AWE is compliant with the NHSEC Rules and Certificate conditions as all receptors have results showing less than 8 hours of shadow flicker during the monitoring period.

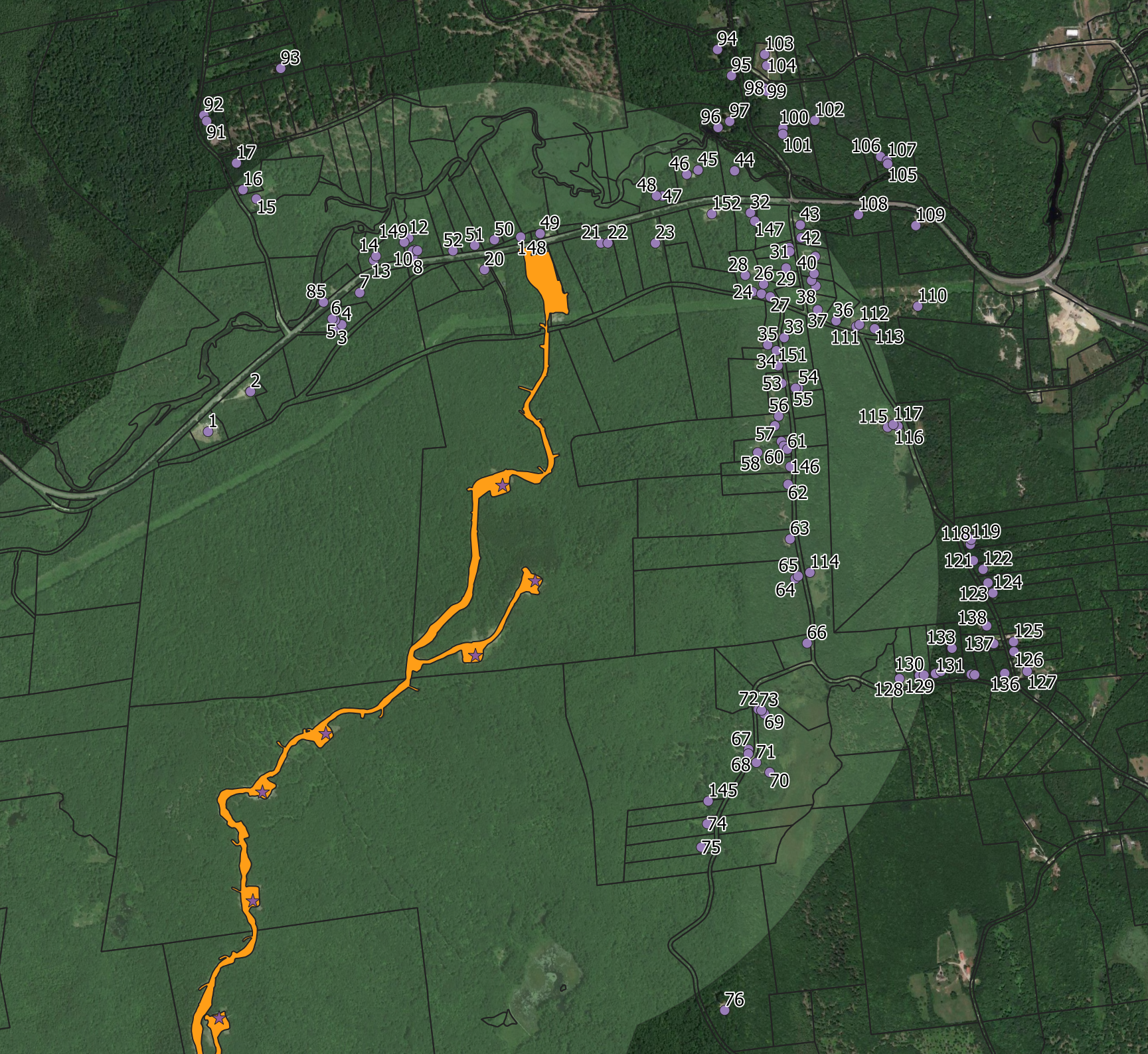


Appendix A – Maps

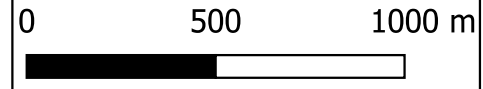
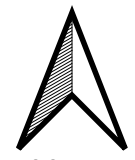
Map A01

Legend

- ★ Turbines
- Project zone
- Parcels boundary
- Buffer (1 mile)
- Receptors



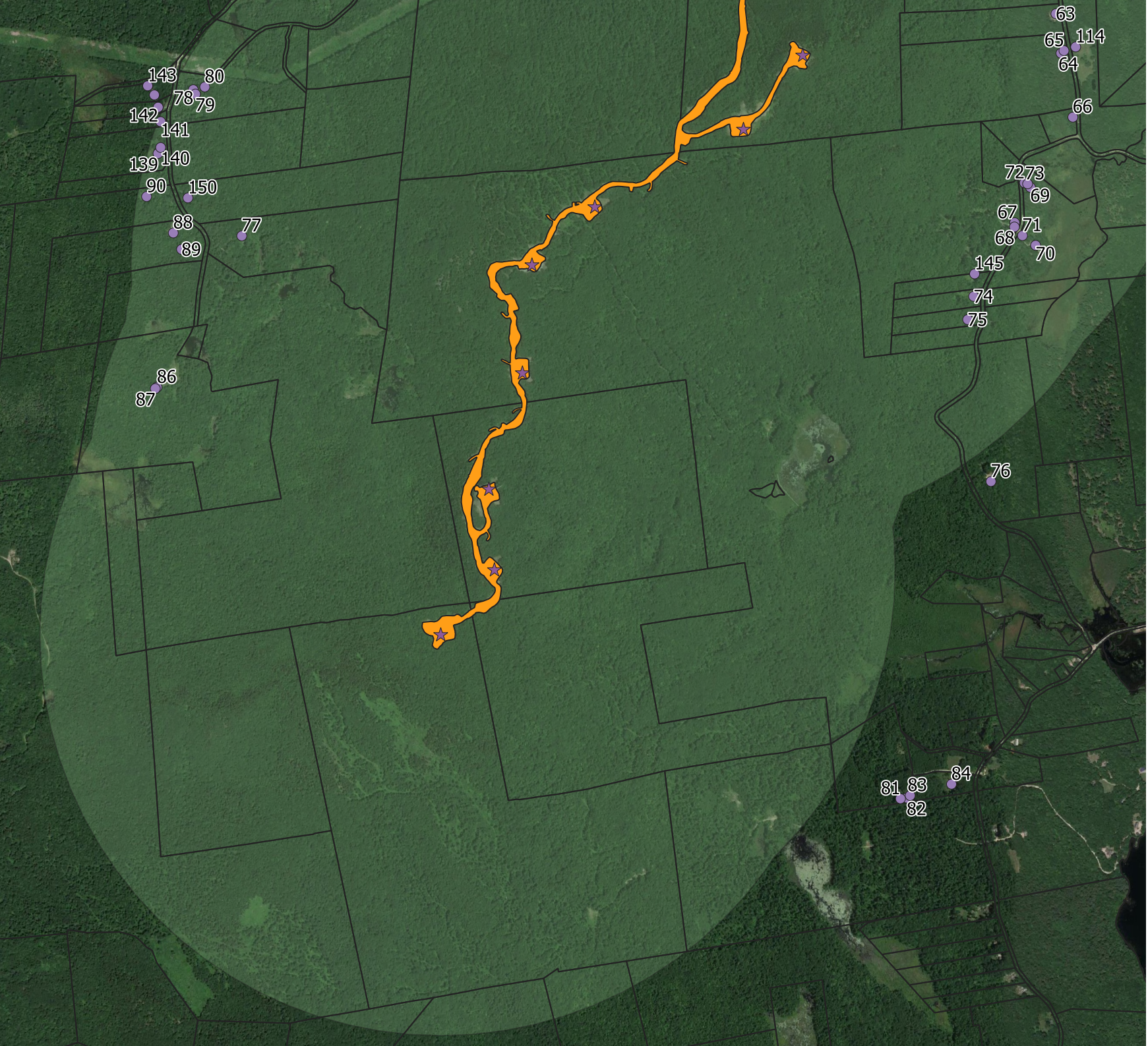
Antrim Wind Energy
Shadow flicker receptors



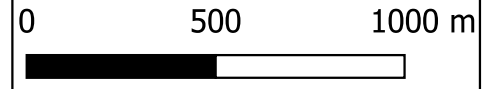
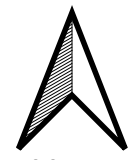
Map A02

Legend

- ★ Turbines
- Project zone
- Parcels boundary
- Buffer (1 mile)
- Receptors



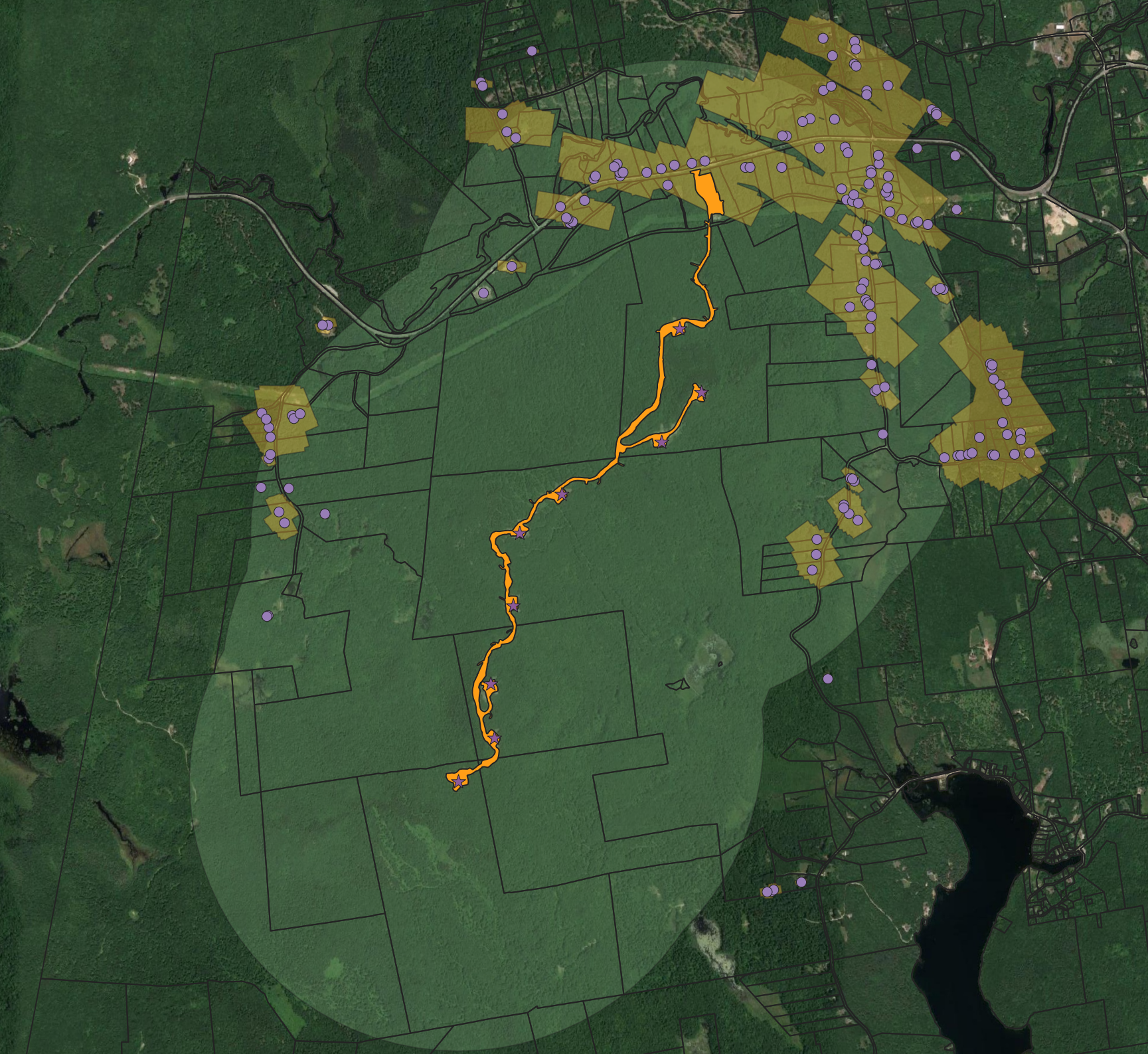
Antrim Wind Energy
Shadow flicker receptors



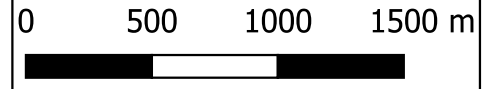
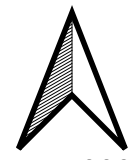
Map A03

Legend

- ★ Turbines
- Project zone
- Parcels boundary
- Buffer (1 mile)
- Receptors
- SF tracking coverage



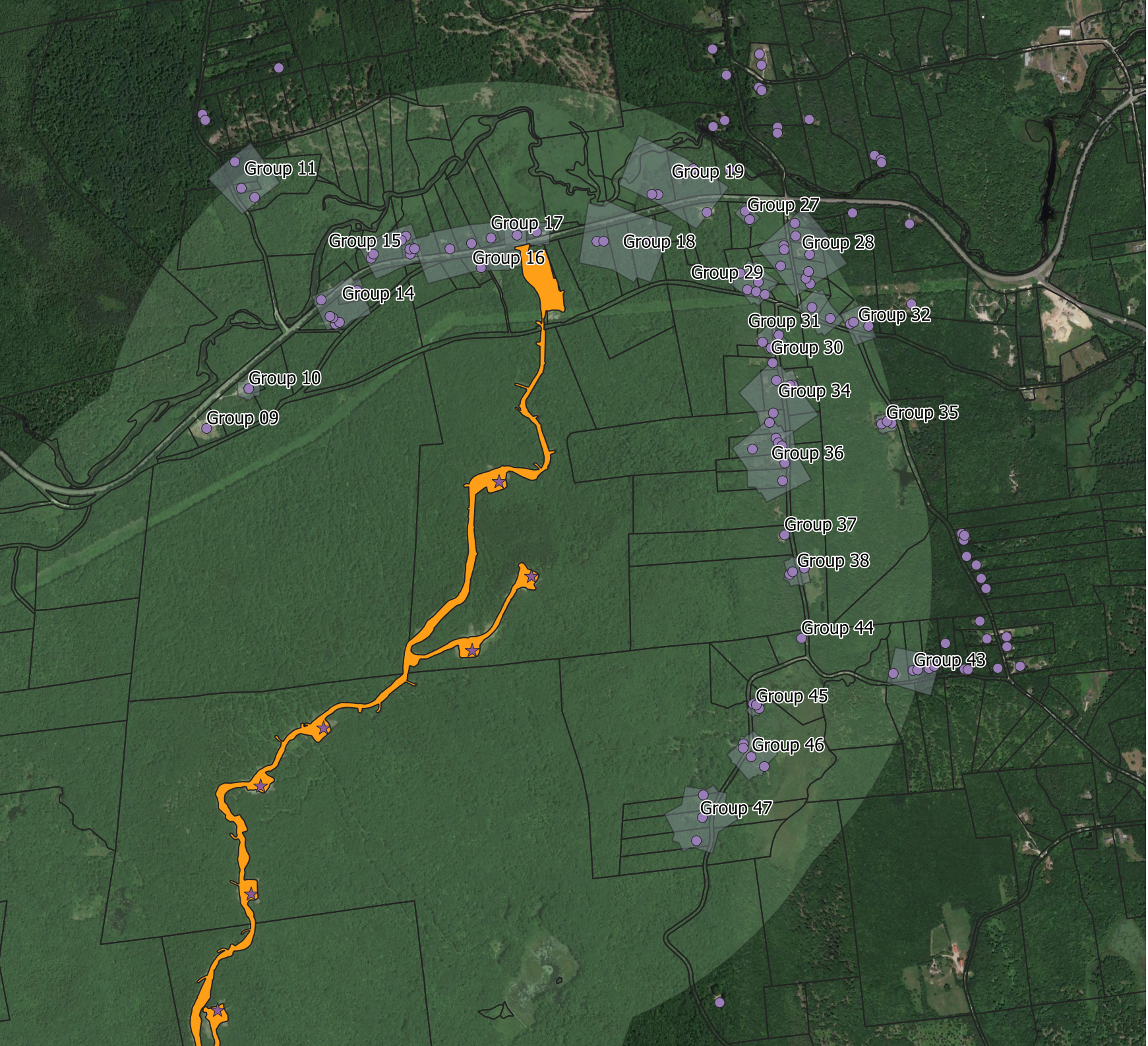
Antrim Wind Energy
Shadow flicker tracking coverage



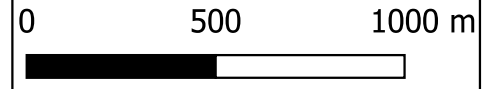
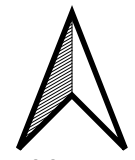
Map A04

Legend

- ★ Turbines
- Project zone
- Parcels boundary
- Buffer (1 mile)
- Receptors
- Groups



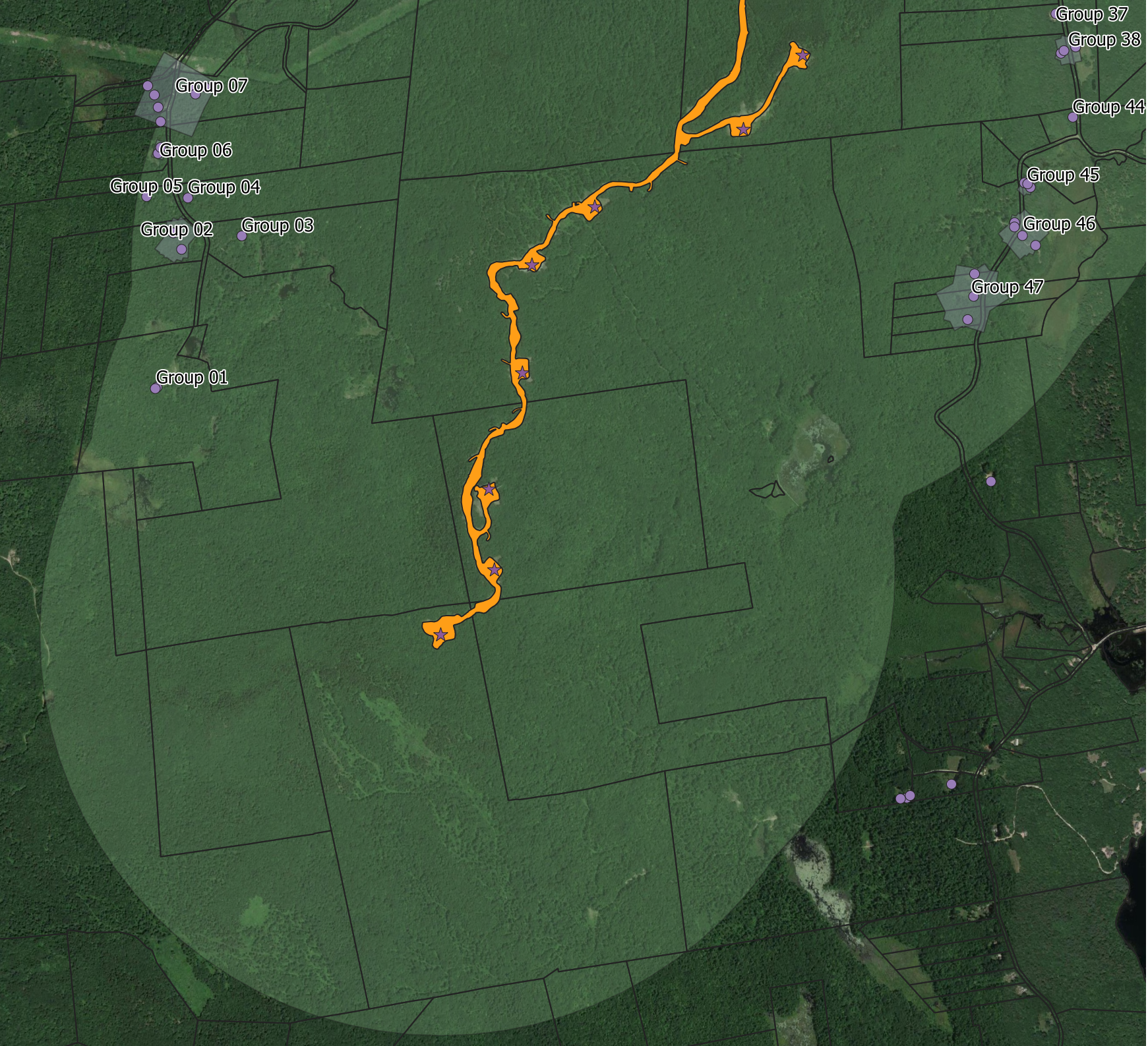
Antrim Wind Energy
Shadow flicker groups



Map A05

Legend

- ★ Turbines
- Project zone
- Parcels boundary
- Buffer (1 mile)
- Receptors
- Groups



TransAltaTM

Antrim Wind Energy
Shadow flicker groups

0 500 1000 m



Appendix B – SCADA shadow flicker compilation

Receptor	Lot no.	Parcel ID	Location	Within 1 mile of a turbine	Latitude	Longitude	Receptor group	YTD Group Shadow flicker occurred (hour)	YTD Group Shadow flicker protection (hour)	YTD Receptor Shadow flicker occurred (hour)	Below 8h allowance
1	222-003-000	1791	KEENE ROAD	YES	43.06946532	-72.0222675	Group 09	2.6	0.0	2.1	YES
2	222-002-000	1197	408 KEENE ROAD	YES	43.07091006	-72.0201972	Group 10	8.0	12.7	3.7	YES
3	211-003-000	694	398 KEENE ROAD	YES	43.07325594	-72.0159444	Group 14	8.0	31.6	4.0	YES
4	211-003-000	694	398 KEENE ROAD	YES	43.07332255	-72.0157432	Group 14	8.0	31.6	4.1	YES
5	211-003-000	694	398 KEENE ROAD	YES	43.07348236	-72.0160812	Group 14	8.0	31.6	3.9	YES
6	211-003-000	694	398 KEENE ROAD	YES	43.07353453	-72.0162113	Group 14	8.0	31.6	3.8	YES
7	211-002-000	1529	372 KEENE ROAD	YES	43.07447444	-72.0148725	Group 14	8.0	31.6	1.3	YES
8	211-033-000	1333	363 KEENE ROAD	YES	43.07579576	-72.0122698	Group 15	0.0	0.0	0.0	YES
9	211-033-000	1333	363 KEENE ROAD	YES	43.0760154	-72.0122113	Group 15	0.0	0.0	0.0	YES
10	211-033-000	1333	363 KEENE ROAD	YES	43.07598132	-72.0122898	Group 15	0.0	0.0	0.0	YES
11	211-033-000	1333	363 KEENE ROAD	YES	43.07599371	-72.0120582	Group 15	0.0	0.0	0.0	YES
12	211-033-000	1333	363 KEENE ROAD	YES	43.07644215	-72.0124859	Group 15	0.0	0.0	0.0	YES
13	211-032-000	406	375 KEENE ROAD	YES	43.07564392	-72.014196	Group 15	0.0	0.0	0.0	YES
14	211-032-000	406	375 KEENE ROAD	YES	43.07579136	-72.0140821	Group 15	0.0	0.0	0.0	YES
15	211-028-000	1184	43 LOVERENS MILL ROAD	YES	43.0778236	-72.0199507	Group 11	0.0	0.0	0.0	YES
16	211-027-000	970	45 LOVERENS MILL ROAD	YES	43.07815293	-72.020606	Group 11	0.0	0.0	0.0	YES
17	211-026-000	1415	47 LOVERENS MILL ROAD	NO	43.07910619	-72.0209329	Group 11	0.0	0.0	0.0	YES
18	222-010-000	1702	KEENE ROAD	NO	43.06770487	-72.0336691	Group 08	0.0	0.0	0.0	YES
19	222-010-000	1702	KEENE ROAD	NO	43.06770663	-72.0340774	Group 08	0.0	0.0	0.0	YES
20	212-032-000	395	362 KEENE ROAD	YES	43.07531829	-72.0087713	Group 16	0.0	0.0	0.0	YES
21	212-026-000	733	344 KEENE ROAD	YES	43.07628792	-72.0030738	Group 18	0.0	0.0	0.0	YES
22	212-026-000	733	344 KEENE ROAD	YES	43.07629251	-72.0027367	Group 18	0.0	0.0	0.0	YES
23	212-024-000	1417	340 KEENE ROAD	YES	43.07629527	-72.0004097	Group 18	0.0	0.0	0.0	YES
24	212-016-000	565	7 BRACKETT ROAD	YES	43.07456185	-71.9956408	Group 29	6.5	0.0	1.9	YES
25	212-016-000	565	7 BRACKETT ROAD	YES	43.07448893	-71.9952077	Group 29	6.5	0.0	1.6	YES
26	212-016-000	565	7 BRACKETT ROAD	YES	43.07483929	-71.9951057	Group 29	6.5	0.0	1.8	YES
27	212-016-000	565	7 BRACKETT ROAD	YES	43.07438656	-71.9947756	Group 29	6.5	0.0	1.6	YES
28	212-016-000	565	7 BRACKETT ROAD	YES	43.07515348	-71.9960032	Group 29	6.5	0.0	2.5	YES
29	212-019-000	566	130 REED CARR ROAD	YES	43.07542152	-71.9940073	Group 28	8.0	25.2	1.5	YES
30	212-020-000	564	134 REED CARR ROAD	YES	43.07615539	-71.9938633	Group 28	8.0	25.2	2.1	YES
31	212-020-000	564	134 REED CARR ROAD	YES	43.07601206	-71.9938371	Group 28	8.0	25.2	2.0	YES
32	212-022-000	1152	334 KEENE ROAD	YES	43.07739811	-71.9957628	Group 27	0.0	0.0	0.0	YES
33	212-010-000	1354	95 REED CARR ROAD	YES	43.07292407	-71.9940854	Group 30	6.9	0.0	3.1	YES
34	212-012-000	575	90 REED CARR ROAD	YES	43.07245374	-71.9944674	Group 30	6.9	0.0	3.3	YES
35	212-013-000	576	92 REED CARR ROAD	YES	43.07266255	-71.9948922	Group 30	6.9	0.0	3.3	YES
36	212-008-000	2025	5 BRACKETT ROAD	YES	43.07353403	-71.9915504	Group 31	8.0	23.4	2.3	YES
37	212-007-000	562	121 REED CARR ROAD	YES	43.07392689	-71.9924549	Group 31	8.0	23.4	3.1	YES
38	212-006-000	690	123 REED CARR ROAD	YES	43.07478161	-71.992548	Group 28	8.0	25.2	1.0	YES
39	212-006-000	690	123 REED CARR ROAD	YES	43.07497914	-71.9927599	Group 28	8.0	25.2	1.1	YES
40	212-005-000	1293	127 REED CARR ROAD	YES	43.07522462	-71.9926325	Group 28	8.0	25.2	1.1	YES
41	212-004-000	809	131 REED CARR ROAD	YES	43.07583679	-71.9925818	Group 28	8.0	25.2	1.1	YES
42	212-003-000	964	135 REED CARR ROAD	YES	43.07651065	-71.9932759	Group 28	8.0	25.2	2.0	YES
43	212-002-000	1274	139 REED CARR ROAD	YES	43.07696781	-71.9933171	Group 28	8.0	25.2	1.8	YES
44	212-052-000	1467	331 KEENE ROAD	YES	43.07889985	-71.9965474	Group 20	0.0	0.0	0.0	YES
45	212-051-000	1668	335 KEENE ROAD	YES	43.07892268	-71.9983343	Group 19	0.0	0.0	0.0	YES
46	212-051-000	1668	335 KEENE ROAD	YES	43.07876632	-71.9988897	Group 19	0.0	0.0	0.0	YES
47	212-050-000	502	339 KEENE ROAD	YES	43.07798623	-72.0000711	Group 19	0.0	0.0	0.0	YES
48	212-050-000	502	339 KEENE ROAD	YES	43.07799472	-72.0003687	Group 19	0.0	0.0	0.0	YES

Receptor	Lot no.	Parcel ID	Location	Within 1 mile of a turbine	Latitude	Longitude	Receptor group	YTD Group Shadow flicker occurred (hour)	YTD Group Shadow flicker protection (hour)	YTD Receptor Shadow flicker occurred (hour)	Below 8h allowance
49	212-044-000	549	345 KEENE ROAD	YES	43.076621	-72.0060523	Group 17	0.0	0.0	0.0	YES
50	212-040-000	567	351 KEENE ROAD	YES	43.07639192	-72.0082904	Group 16	0.0	0.0	0.0	YES
51	212-039-000	1185	355 KEENE ROAD	YES	43.07619091	-72.0092522	Group 16	0.0	0.0	0.0	YES
52	212-038-000	1328	359 KEENE ROAD	YES	43.07599257	-72.0103148	Group 16	0.0	0.0	0.0	YES
53	221-010-000	559	80 REED CARR ROAD	YES	43.07128345	-71.9941942	Group 34	8.0	60.4	1.2	YES
54	221-011-000	1108	21 REED CARR ROAD	YES	43.07111574	-71.9933802	Group 34	8.0	60.4	1.1	YES
55	221-011-000	1108	21 REED CARR ROAD	YES	43.07111011	-71.9935242	Group 34	8.0	60.4	1.1	YES
56	221-009-000	1466	72 REED CARR ROAD	YES	43.07010506	-71.994344	Group 34	8.0	60.4	1.7	YES
57	221-009-000	1466	72 REED CARR ROAD	YES	43.0697597	-71.9945284	Group 34	8.0	60.4	1.8	YES
58	221-008-000	969	66 REED CARR ROAD	YES	43.06879635	-71.9953638	Group 36	8.0	50.0	1.6	YES
59	221-008-000	969	66 REED CARR ROAD	YES	43.06919819	-71.9942054	Group 36	8.0	50.0	1.4	YES
60	221-008-000	969	66 REED CARR ROAD	YES	43.06903201	-71.9940843	Group 36	8.0	50.0	1.4	YES
61	221-008-000	969	66 REED CARR ROAD	YES	43.06892066	-71.9939093	Group 36	8.0	50.0	1.4	YES
62	221-006-000	668	58 REED CARR ROAD	YES	43.06765898	-71.99387	Group 36	8.0	50.0	1.4	YES
63	221-004-000	1054	38 REED CARR ROAD	YES	43.065701	-71.9937612	Group 37	1.3	0.0	1.0	YES
64	221-003-000	1624	20 REED CARR ROAD	YES	43.06427338	-71.9935033	Group 38	7.7	0.0	3.0	YES
65	221-003-000	1624	20 REED CARR ROAD	YES	43.06436829	-71.993358	Group 38	7.7	0.0	2.8	YES
66	221-002-000	419	6 REED CARR ROAD	YES	43.06196373	-71.9929072	Group 44	0.6	0.0	0.5	YES
67	226-010-000	596	224 CRAIG ROAD	YES	43.05814121	-71.9957527	Group 46	0.0	0.0	0.0	YES
68	226-010-000	596	224 CRAIG ROAD	YES	43.05798748	-71.9957644	Group 46	0.0	0.0	0.0	YES
69	226-002-000	597	235 CRAIG ROAD	YES	43.05942211	-71.9949844	Group 45	2.9	0.0	1.3	YES
70	226-002-000	597	235 CRAIG ROAD	YES	43.0573246	-71.994717	Group 46	0.0	0.0	0.0	YES
71	226-002-000	597	235 CRAIG ROAD	YES	43.05767568	-71.9953665	Group 46	0.0	0.0	0.0	YES
72	226-002-000	597	235 CRAIG ROAD	YES	43.05958474	-71.9952778	Group 45	2.9	0.0	1.3	YES
73	226-002-000	597	235 CRAIG ROAD	YES	43.05954703	-71.995123	Group 45	2.9	0.0	1.3	YES
74	226-008-000	1404	118 CRAIG ROAD	YES	43.05547174	-71.9977611	Group 47	7.5	0.0	1.5	YES
75	226-007-000	393	112 CRAIG ROAD	YES	43.05463186	-71.998048	Group 47	7.5	0.0	0.0	YES
76	235-016-000	593	77 CRAIG ROAD	NO	43.04878197	-71.9968712	Group 48	0.0	0.0	0.0	YES
77	224-002-000	1076	156 SALMON BROOK ROAD	YES	43.05754833	-72.033833	Group 03	7.7	0.0	5.5	YES
78	223-001-000	780	68 SALMON BROOK ROAD	YES	43.06282431	-72.0362545	Group 07	8.0	5.4	1.5	YES
79	223-001-000	780	68 SALMON BROOK ROAD	YES	43.06266911	-72.0361467	Group 07	8.0	5.4	1.5	YES
80	223-001-000	780	68 SALMON BROOK ROAD	YES	43.06292776	-72.0356879	Group 07	8.0	5.4	1.6	YES
81	240-014-000	1169	53 BRIMSTONE CORNER ROAD	NO	43.03730204	-72.0012669	Group 50	0.0	0.0	0.0	YES
82	240-014-000	1169	53 BRIMSTONE CORNER ROAD	NO	43.0373287	-72.0009566	Group 50	0.0	0.0	0.0	YES
83	240-014-000	1169	53 BRIMSTONE CORNER ROAD	NO	43.03741533	-72.0007899	Group 50	0.0	0.0	0.0	YES
84	240-013-000	1424	55 BRIMSTONE CORNER ROAD	NO	43.03783397	-71.9987567	Group 49	0.0	0.0	0.0	YES
85	211-030-000	1761	385 KEENE ROAD	YES	43.07412976	-72.0166452	Group 14	8.0	31.6	3.2	YES
86	224-005-000	1455	200 SALMON BROOK ROAD	YES	43.05206126	-72.0379773	Group 01	8.0	1.0	6.1	YES
87	224-005-000	1455	200 SALMON BROOK ROAD	YES	43.05201481	-72.0380624	Group 01	8.0	1.0	6.1	YES
88	224-008-000	1637	157 SALMON BROOK ROAD	YES	43.05764381	-72.0372096	Group 02	8.0	25.8	1.2	YES
89	224-008-000	1637	157 SALMON BROOK ROAD	YES	43.05705174	-72.0367973	Group 02	8.0	25.8	2.2	YES
90	224-009-000	1638	127 SALMON BROOK ROAD	YES	43.05895407	-72.0385322	Group 05	1.2	0.0	0.9	YES
91	211-010-000	448	63 LOVERENS MILL ROAD	NO	43.08060581	-72.0223991	Group 12	0.0	0.0	0.0	YES
92	211-010-000	448	63 LOVERENS MILL ROAD	NO	43.0808172	-72.0225342	Group 12	0.0	0.0	0.0	YES
93	211-009-000	706	71 LOVERENS MILL ROAD	NO	43.08250887	-72.0187843	Group 13	0.0	0.0	0.0	YES
94	208-001-000	392	50 LIBERTY FARM ROAD	NO	43.08325146	-71.9974082	Group 21	0.0	0.0	0.0	YES
95	208-002-000	924	48 LIBERTY FARM ROAD	NO	43.08231503	-71.9967172	Group 21	0.0	0.0	0.0	YES
96	212-053-000	927	14 LIBERTY FARM ROAD	NO	43.08045207	-71.9973657	Group 20	0.0	0.0	0.0	YES

Receptor	Lot no.	Parcel ID	Location	Within 1 mile of a turbine	Latitude	Longitude	Receptor group	YTD Group Shadow flicker occurred (hour)	YTD Group Shadow flicker protection (hour)	YTD Receptor Shadow flicker occurred (hour)	Below 8h allowance
97	212-053-000	927	14 LIBERTY FARM ROAD	NO	43.08067501	-71.9967949	Group 20	0.0	0.0	0.0	YES
98	212-059-000	1103	11 STACY HILL ROAD	NO	43.08187432	-71.9951162	Group 22	0.0	0.0	0.0	YES
99	212-059-000	1103	11 STACY HILL ROAD	NO	43.08176123	-71.9949738	Group 22	0.0	0.0	0.0	YES
100	212-060-000	1165	15 LIBERTY FARM ROAD	NO	43.08044015	-71.994185	Group 23	0.0	0.0	0.0	YES
101	212-060-000	1165	15 LIBERTY FARM ROAD	NO	43.08022446	-71.9941923	Group 23	0.0	0.0	0.0	YES
102	212-058-000	1109	17 STACY HILL ROAD	NO	43.08072356	-71.992628	Group 23	0.0	0.0	0.0	YES
103	212-054-000	704	8 STACY HILL ROAD	NO	43.08308142	-71.9950956	Group 22	0.0	0.0	0.0	YES
104	212-054-000	704	8 STACY HILL ROAD	NO	43.08268312	-71.9949932	Group 22	0.0	0.0	0.0	YES
105	213-011-000	450	33 STACY HILL ROAD	NO	43.07917217	-71.9890527	Group 24	0.0	0.0	0.0	YES
106	213-011-000	450	33 STACY HILL ROAD	NO	43.07943296	-71.989402	Group 24	0.0	0.0	0.0	YES
107	213-011-000	450	33 STACY HILL ROAD	NO	43.07929127	-71.9890794	Group 24	0.0	0.0	0.0	YES
108	212-001-000	1062	151 REED CARR ROAD	NO	43.07734631	-71.9904743	Group 26	0.0	0.0	0.0	YES
109	213-009-000	384	286 KEENE ROAD	NO	43.07696067	-71.9876661	Group 25	0.0	0.0	0.0	YES
110	213-008-000	1983	3 BRACKETT ROAD	NO	43.07406686	-71.9875548	Group 33	0.0	0.0	0.0	YES
111	212-009-000	1982	119 REED CARR ROAD	YES	43.07333195	-71.9905632	Group 32	1.8	0.0	0.4	YES
112	212-009-000	1982	119 REED CARR ROAD	YES	43.07340217	-71.9904036	Group 32	1.8	0.0	0.4	YES
113	212-009-000	1982	119 REED CARR ROAD	NO	43.07325645	-71.9896601	Group 32	1.8	0.0	0.0	YES
114	221-014-000	967	15 REED CARR ROAD	YES	43.0645025	-71.9927825	Group 38	7.7	0.0	2.5	YES
115	220-012-000	1129	50 OLD CARR ROAD	YES	43.06972281	-71.9890081	Group 35	0.6	0.0	0.3	YES
116	220-012-000	1129	50 OLD CARR ROAD	YES	43.06975708	-71.9885033	Group 35	0.6	0.0	0.3	YES
117	220-012-000	1129	50 OLD CARR ROAD	YES	43.06982125	-71.9887332	Group 35	0.6	0.0	0.3	YES
118	220-015-000	865	43 OLD CARR ROAD	NO	43.06553312	-71.9849363	Group 39	0.0	0.0	0.0	YES
119	220-015-000	865	43 OLD CARR ROAD	NO	43.06570569	-71.9848978	Group 39	0.0	0.0	0.0	YES
120	220-015-000	865	43 OLD CARR ROAD	NO	43.06577166	-71.9850328	Group 39	0.0	0.0	0.0	YES
121	220-016-000	1381	39 OLD CARR ROAD	NO	43.0649486	-71.9847877	Group 39	0.0	0.0	0.0	YES
122	220-017-000	1356	35 OLD CARR ROAD	NO	43.06463812	-71.9843091	Group 39	0.0	0.0	0.0	YES
123	220-018-000	1504	31 OLD CARR ROAD	NO	43.06415323	-71.984066	Group 39	0.0	0.0	0.0	YES
124	220-019-000	427	27 OLD CARR ROAD	NO	43.0637915	-71.9838232	Group 39	0.0	0.0	0.0	YES
125	220-021-000	829	15 OLD CARR ROAD	NO	43.06204476	-71.982804	Group 40	0.0	0.0	0.0	YES
126	220-022-000	759	9 OLD CARR ROAD	NO	43.0616888	-71.9827824	Group 40	0.0	0.0	0.0	YES
127	220-023-000	1423	5 OLD CARR ROAD	NO	43.06098405	-71.9821313	Group 41	0.0	0.0	0.0	YES
128	220-002-000	459	117 OLD POUND ROAD	YES	43.06070597	-71.9883807	Group 43	3.6	0.0	1.3	YES
129	220-003-000	1465	115 OLD POUND ROAD	YES	43.06082122	-71.9874087	Group 43	3.6	0.0	1.0	YES
130	220-003-000	1465	115 OLD POUND ROAD	YES	43.0608359	-71.9871808	Group 43	3.6	0.0	1.0	YES
131	220-004-000	860	113 OLD POUND ROAD	NO	43.06089067	-71.9866197	Group 43	3.6	0.0	0.0	YES
132	220-004-000	860	113 OLD POUND ROAD	NO	43.06097099	-71.9863515	Group 43	3.6	0.0	0.0	YES
133	220-005-000	702	111 OLD POUND ROAD	NO	43.06180263	-71.9858146	Group 42	0.0	0.0	0.0	YES
134	220-006-000	1512	109 OLD POUND ROAD	NO	43.06085245	-71.9846994	Group 42	0.0	0.0	0.0	YES
135	220-006-000	1512	109 OLD POUND ROAD	NO	43.06086962	-71.98487	Group 42	0.0	0.0	0.0	YES
136	220-008-000	1002	103 OLD POUND ROAD	NO	43.06090901	-71.9832301	Group 41	0.0	0.0	0.0	YES
137	220-009-000	1510	12 OLD CARR ROAD	NO	43.0619725	-71.9837734	Group 40	0.0	0.0	0.0	YES
138	220-010-000	1000	16 OLD CARR ROAD	NO	43.0626085	-71.9841196	Group 40	0.0	0.0	0.0	YES
139	223-003-000	2006	117 SALMON BROOK ROAD	YES	43.06051366	-72.0379789	Group 06	3.6	0.0	1.9	YES
140	223-003-000	2006	117 SALMON BROOK ROAD	YES	43.06073057	-72.0378502	Group 06	3.6	0.0	1.8	YES
141	223-004-000	494	107 SALMON BROOK ROAD	YES	43.06166439	-72.037857	Group 07	8.0	5.4	1.3	YES
142	223-005-000	1121	103 SALMON BROOK ROAD	NO	43.06218491	-72.0379823	Group 07	8.0	5.4	0.0	YES
143	223-006-000	422	99 SALMON BROOK ROAD	NO	43.06295826	-72.0385023	Group 07	8.0	5.4	0.0	YES
144	223-006-000	422	99 SALMON BROOK ROAD	NO	43.06262898	-72.0381705	Group 07	8.0	5.4	0.0	YES

Receptor	Lot no.	Parcel ID	Location	Within 1 mile of a turbine	Latitude	Longitude	Receptor group	YTD Group Shadow flicker occurred (hour)	YTD Group Shadow flicker protection (hour)	YTD Receptor Shadow flicker occurred (hour)	Below 8h allowance
145	226-009-000	568	CRAIG ROAD	YES	43.05628535	-71.9977182	Group 47	7.5	0.0	0.0	YES
146	221-007-000	1112	62 REED CARR ROAD	YES	43.06829684	-71.9937656	Group 36	8.0	50.0	1.4	YES
147	212-022-000	1152	334 KEENE ROAD	YES	43.07709654	-71.9955495	Group 27	0.0	0.0	0.0	YES
148	212-043-000	1664	349 KEENE ROAD	YES	43.07649611	-72.0070062	Group 17	0.0	0.0	0.0	YES
149	211-033-000	1333	363 KEENE ROAD	YES	43.07629277	-72.0127075	Group 15	0.0	0.0	0.0	YES
150	224-001-000	1416	128 SALMON BROOK ROAD	YES	43.05891293	-72.0364964	Group 04	2.3	0.0	1.8	YES
151	212-023-000	1057	88 REED CARR ROAD	YES	43.07735099	-71.9976525	Group 34	8.0	60.4	1.4	YES
152	212-011-000	782	336 KEENE ROAD	YES	43.07191704	-71.9943853	Group 19	0.0	0.0	0.0	YES