



## **Section 26**

### **Shadow Flicker**

## Section 26. Shadow Flicker

### 26.1 State Standards

In accordance with 38 M.R.S. § 484(10) and Chapter 382, § 4, an applicant must demonstrate that a proposed wind energy development has been designed to avoid unreasonable adverse shadow flicker effects. Shadow flicker means alternating changes in light intensity caused by rotating wind turbine blades casting shadows on the ground or a stationary object. Shadow flicker occurs as the shadows of the blades move past the observation point, when the rotor is directly between the observer and the sun, and the rotor is spinning. An applicant must demonstrate that the project will not generate more than 30 hours per year of shadow flicker on any occupied building on property not owned by the applicant, or subject to an easement for shadow flicker.

### 26.2 Shadow Flicker Approach

The Applicant contracted with DNV to perform a shadow flicker analysis. DNV used WindFarmer: Analyst Version 1.3.4.1 to review the Project and its anticipated flicker. Per the State's requirements, DNV focused on properties within 1 mile of the Project. DNV evaluated six receptors within 1 mile of the Project.

At the time of the assessment, there were six occupied buildings within that radius. Of the six buildings, five are residences and one is a telephone building associated with a microwave tower. Of the five residences, two have provided easements, including for flicker, to the Project. Those easements are included in Section 2: Title, Rights, or Interests.

### 26.3 Shadow Flicker Assessment

As described in the shadow flicker assessment, the Project is not anticipated to produce more than 30-hours of flicker per year at any occupied building.

The shadow flicker assessment summarizes its results in Appendix B.

## APPENDIX B – RECEPTOR LOCATIONS & RESULTS

### Twin Energy Shadow Flicker

Receptor ID	UTM Easting [m]	UTM Northing [m]	Shadow Flicker Results					Turbine IDs Contributing to the Events	Closest Turbine	
			Days per Year	Worst Day	Minutes on Worst Day	Total Hours in Year [hrs/yr]			Distance [ft]	Turbine ID
						Astronomical Worst Case	Expected Case with Monthly Cloud Cover and Wind Rose			
149	373037	4940626	113	4-Apr	60	69	28	T1 T2 T3	2145	T1
3	373126	4940604	108	6-Apr	51	59	24	T1 T2 T3	2429	T1
2	373470	4940579	77	3-Apr	33	30	12	T1 T2 T3	3554	T1
32	370851	4940101	91	3-Aug	32	26	10	T2 T3	3747	T3
31	370618	4939777	56	17-Jun	27	21	9	T3	4710	T3
1	370904	4939670	0	-	0	0	0	-	3967	T3

The above table is applicable to the Twin Energy Project only. Cumulatively, when adding results from the neighboring wind project RoxWind, Receptor 149 increases to 36 shadow flicker hours per year and receptor 3 increases to 32 shadow flicker hours per year. It is noted that both these receptor properties have obtained easements therefore, shadow flicker limits do not apply.

See the attached shadow flicker assessment in Exhibit 26-1 for the modeling assumptions and the potential shadow flicker at the six receptors.



Exhibit 26-1  
Shadow Flicker Assessment





































