



5372 Sweetland Wind - 210223L_Sound & Flicker Analyses Summary.docx

PRINCIPALS

March 8, 2021

Epsilon Ref. 5372

Mr. Mark Wengierski
 Senior Project Manager
 Scout Clean Energy
 4865 Sterling Drive, Suite 200
 Boulder, CO 80301

**Subject: Revisions to the November 15, 2019 Sound & Shadow Flicker Analyses
 Sweetland Wind Project – Hand County, South Dakota**

Dear Mr. Wengierski:

Sound level and shadow flicker analyses were originally performed for the Sweetland Wind Project with the results presented in reports dated March 5, 2019. These analyses were updated and reported in an addendum letter dated November 15, 2019 for a revised layout. Since that time, additional modifications were made to the wind turbine layout. A new layout was provided to Epsilon with the date of February 23, 2021. For purposes of this letter, the layout will be referred to as “Layout 210223”.

ASSOCIATES

There were 80 wind turbines (including 9 alternates) contained in the layout presented in the November 2019 addendum letter. Seventy-seven (77) of the wind turbines from the addendum letter were GE 2.82-127 units with a hub height of 89 meters and a rotor diameter of 127 meters. Three (3) of the 80 turbines were GE 2.32-116 units with a hub height of 80 meters and a rotor diameter of 116 meters. The current Layout 210223 contains 80 wind turbines, all of which are proposed to be GE 2.82-127 units with a rotor diameter of 127 meters and a hub height of 89 meters. As it pertains to the sound level modeling, no wind turbines were modeled with Low Noise Trailing Edge blades in Layout 210223 and no changes to the substation were made in this modeling scenario as compared to the March 2019 analysis. The modified wind turbine layout has been modeled to predict the sound levels and the annual expected durations of shadow flicker due to the operation of the proposed wind turbines at occupied residences in Hand County, SD.

It should be noted that on May 10, 2019, the Project team received confirmation from the Hand County Tax Assessor that the residence of Dale G. Christiansen (modeling

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receptor 34) is not an occupied residence. Receptor 34 has therefore been excluded from these revised sound level and shadow flicker analyses. Additionally, Epsilon received notice that on November 14, 2019 the structure represented by modeling receptor 20 was razed. The structure was razed after the current modeling analyses had been performed, and therefore the results at receptor 20 remain in this report.

Based on the modifications to the wind turbine layout, the sound levels at all 40 modeling receptors showed a change of 1 dBA or less. Two (2) receptors are modeled to receive sound levels 1 dBA higher than the values presented in the November 2019 addendum letter. The predicted worst-case sound levels from the Sweetland Wind Project are at or below the 50 dBA limit at participating residences and are below 42 dBA at non-participating residences. Therefore, the Project still meets the requirements with respect to sound in the Hand County Development Agreement dated December 4, 2018 (Development Agreement). An updated sound level results table from Appendix B in the March 5, 2019 report is attached as Table B-1 Rev (S) which contains residence participation consistent with the November 2019 letter.

Based on the modifications to the wind turbine layout, the shadow flicker durations at 22 of the 40 modeling receptors showed no change, while 18 of the 40 modeling receptors showed a change since the November 2019 letter. Of the 18 modeling receptors where a change in the annual expected shadow flicker was modeled, 10 receptors will experience less shadow flicker. Respectively, eight (8) of the modeling receptors will experience more shadow flicker than shown in the November 2019 letter. The largest increase in predicted shadow flicker is 3 hours, 45 minutes and is modeled at participating receptor 6 (Eric Fanning). Increases at the other seven receptors are less. The predicted annual shadow flicker durations with Layout 201223 range from 0 hours, 0 minutes to 41 hours, 41 minutes at the modeled receptors. The maximum modeled expected duration of shadow flicker (41 hours, 41 minutes) is predicted at a participating residence (modeling receptor 4). This is also the only modeled receptor to exceed 30 hrs/yr of expected shadow flicker and it is Epsilon's understanding that a waiver has been received from the participant modeled over 30 hours of shadow flicker. The maximum modeled expected duration of shadow flicker predicted at a non-participating residence (modeling receptor 15) is 5 hours, 27 minutes. Therefore, the Project still meets the requirements with respect to shadow flicker in the Development Agreement. An updated shadow flicker results table from Appendix B in the March 5, 2019 report is attached as Table B-1 Rev (F) which contains residence participation consistent with the November 2019 letter.

Mr. Mark Wengierski
Scout Clean Energy
March 8, 2021

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If you have any questions, please call me at (978) 461-6232, or e-mail me at ccyr@epsilonassociates.com.

Sincerely,

EPSILON ASSOCIATES, INC.

A handwritten signature in black ink that reads "Clinton D. Cyr". The signature is written in a cursive style with a large, prominent "C" at the beginning.

Clinton D. Cyr, PE, INCE
Senior Engineer

Table B-1 Rev (S): Modeled Sound Pressure Levels at Occupied Residences

Receptor ID	Description	Coordinates UTM NAD83 Zone 14N		Participation Status	Source Only Broadband L _{eq} Sound Level (dBA)
		X (m)	Y (m)		
1	Dale& Leanna Resel	510861.20	4922299.80	Participating	47
2	Dale& Leanna Resel	510617.45	4921033.54	Participating	47
3	John& Kimberly Fanning	511084.98	4919693.62	Participating	50
4	Jeremy& Marci Stevens	509240.44	4918553.74	Participating	48
5	James& Renae Aalbers	511442.82	4917952.72	Participating	50
6	Eric Fanning	512329.39	4917967.20	Participating	50
7	Jason D Resel	515363.03	4919055.61	Participating	49
8	Lyle& Rebecca Resel	516342.30	4921246.06	Participating	43
9	James Major	515803.65	4922429.04	Participating	44
10	36891 St	515499.23	4922661.77	Participating	45
11	Steve Runge	515658.09	4923385.39	Non-Participating	41
12	Craig& Cheryl Van Asperen	517511.88	4916440.42	Participating	45
13	Cole Mehling	518901.01	4916154.62	Participating	39
14	Karen& Clinton Haigh	515701.85	4915097.07	Participating	49
15	Gilbert& Stephanie Rodgers	518930.64	4914440.16	Non-Participating	39
16	Reynolds Family Farms LLC	520879.37	4913213.26	Non-Participating	37
17	L Brewer 37386	523539.62	4913117.77	Non-Participating	31
18	Jay Anderberg	517896.23	4912672.02	Participating	47
19	Jay Anderberg cabin	517856.16	4912818.41	Participating	46
20	Jeremy& Marci Stevens	515809.40	4912961.25	Participating	50
21	Wayne& Joan Horsley Residence	518872.55	4911572.32	Participating	49
22	Travis Letsche	514315.01	4909824.50	Participating	35
23	Robert Duxbury	522266.31	4909368.02	Non-Participating	33
24	Paul Duxbury	522159.03	4909019.95	Non-Participating	33
25	Dean Duxbury	522748.18	4908152.95	Non-Participating	29
26	Leon& Lori Boomsma	515422.97	4908930.39	Participating	34
27	Scot Parmely	514136.35	4907279.00	Non-Participating	31
28	Non-valuated property	520868.09	4906901.58	Non-Participating	31
29	Non-valuated property	517417.40	4907112.62	Non-Participating	26
30	M Anson	517347.17	4906873.43	Non-Participating	32
31	Joe Jensen	513813.93	4906527.92	Non-Participating	30
32	Howard Jensen	513722.68	4906535.03	Non-Participating	30
33	Kevin& Marcie Bertsch	507556.69	4923810.27	Non-Participating	33
36	Larry& Deanne Rowen	517289.54	4921647.66	Non-Participating	38
37	Robert& Patricia Moriarty	510971.00	4912975.40	Non-Participating	38
38	Jerrit Mehling	520521.55	4916748.02	Non-Participating	35
39	Deborah A Mehling Rev Trust	520543.07	4915750.09	Non-Participating	35
40	Gregory Roy Mehling	520533.48	4914986.86	Non-Participating	36
41	Kenneth& Dieanne Wedge	522108.26	4913867.58	Non-Participating	34
42	Daniel W Jensen	512549.23	4909816.85	Non-Participating	33

Table B-1 Rev (F): Shadow Flicker Modeling Results at Occupied Residences

Modeling ID	Description	Participation Status	Coordinates NAD83 UTM Zone 14N (meters)		Expected Shadow Flicker Hours per Year (HH:MM/year)
			X (Easting)	Y (Northing)	
1	Dale& Leanna Resel	Participating	510861.20	4922299.80	25:46
2	Dale& Leanna Resel	Participating	510617.45	4921033.54	6:35
3	John& Kimberly Fanning	Participating	511084.98	4919693.62	17:26
4	Jeremy& Marci Stevens	Participating	509240.44	4918553.74	41:41
5	James& Renae Aalbers	Participating	511442.82	4917952.72	12:25
6	Eric Fanning	Participating	512329.39	4917967.20	15:11
7	Jason D Resel	Participating	515363.03	4919055.61	6:31
8	Lyle& Rebecca Resel	Participating	516342.30	4921246.06	8:36
9	James Major	Participating	515803.65	4922429.04	11:02
10	36891 St	Participating	515499.23	4922661.77	18:13
11	Steve Runge	Non-Participating	515658.09	4923385.39	3:03
12	Craig& Cheryl Van Asperen	Participating	517511.88	4916440.42	9:12
13	Cole Mehling	Participating	518901.01	4916154.62	0:00
14	Karen& Clinton Haigh	Participating	515701.85	4915097.07	3:29
15	Gilbert& Stephanie Rodgers	Non-Participating	518930.64	4914440.16	5:27
16	Reynolds Family Farms LLC	Non-Participating	520879.37	4913213.26	0:00
17	L Brewer 37386	Non-Participating	523539.62	4913117.77	0:00
18	Jay Anderberg	Participating	517896.23	4912672.02	4:07
19	Jay Anderberg cabin	Participating	517856.16	4912818.41	11:07
20	Jeremy& Marci Stevens	Participating	515809.40	4912961.25	9:15
21	Wayne& Joan Horsley Residence	Participating	518872.55	4911572.32	29:39
22	Travis Letsche	Participating	514315.01	4909824.50	0:00
23	Robert Duxbury	Non-Participating	522266.31	4909368.02	0:00
24	Paul Duxbury	Non-Participating	522159.03	4909019.95	0:00
25	Dean Duxbury	Non-Participating	522748.18	4908152.95	0:00
26	Leon& Lori Boomsma	Participating	515422.97	4908930.39	0:00
27	Scot Parmely	Non-Participating	514136.35	4907279.00	0:00
28	Non-valuated property	Non-Participating	520868.09	4906901.58	0:00
29	Non-valuated property	Non-Participating	517417.40	4907112.62	0:00
30	M Anson	Non-Participating	517347.17	4906873.43	0:00
31	Joe Jensen	Non-Participating	513813.93	4906527.92	0:00
32	Howard Jensen	Non-Participating	513722.68	4906535.03	0:00
33	Kevin& Marcie Bertsch	Non-Participating	507556.69	4923810.27	0:00
36	Larry& Deanne Rowen	Non-Participating	517289.54	4921647.66	1:07
37	Robert& Patricia Moriarty	Non-Participating	510971.00	4912975.40	0:00
38	Jerrit Mehling	Non-Participating	520521.55	4916748.02	0:00
39	Deborah A Mehling Rev Trust	Non-Participating	520543.07	4915750.09	0:00
40	Gregory Roy Mehling	Non-Participating	520533.48	4914986.86	0:00
41	Kenneth& Dianne Wedge	Non-Participating	522108.26	4913867.58	0:00
42	Daniel W Jensen	Non-Participating	512549.23	4909816.85	0:00