Technical Memorandum – Sound Assessment
Badger Wind Farm
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Confidentiality classification:
Customer's Discretion

Date:	DNV reference:	Customer reference:
2024-06-19	Proposal Ref.: 315673-HOU-P-01-B Document No.: 10455420-HOU-M-01 Issue: B	Andrew Krieger, Western Permits Manager

Subject: Receptor Noise Compliance - Substation Barrier

Dear Andrew,

Badger Wind, LLC ("Badger" or the "Customer") retained DNV Energy USA Inc.("DNV"), to revise the noise analysis for the proposed Badger Wind Farm located in Logan County and McIntosh County, North Dakota (the "Project"). The purpose of this technical memorandum is to predict the reduction in noise impact caused by the installation of acoustic barriers partially surrounding the transformers located within the proposed electrical substation and its predicted impact at receptors 1003 and 1010, for which a good neighbor agreement is pending.

The Project currently consists of up to 102 wind turbine generators (WTGs) and two step-up transformers within the proposed substation. There are no neighboring wind farms or solar farms near the Project. Only up to 93 of the 102 turbines are planned to be constructed.

As per the North Dakota Administrative Code Section 69-06-08-0, the sound emanating from the Project is subject to a 45 dBA limit within one hundred feet of an inhabited residence or a community building.

The sound pressure level (SPL) at each receptor for the aggregate of all WTGs and transformers was calculated based on the ISO 9613-2 method.

Receptors 1003 and 1010 are located approximately 3086 and 2590 feet southeast of the proposed substation, respectively. Their highest unmitigated cumulative sound pressure levels are 45.5 and 46.7 dBA, respectively. Two proposed, 4.5 m (15 feet) high and 28 m in length, L-shaped acoustic barriers located at the proposed substation are expected to result in a mitigated cumulative sound pressure level of 44.3 and 44.7 dBA at receptors 1003 and 1010, respectively.

Based on the above, in the event that no good neighbor agreement is reached at receptors 1003 and 1010, they are expected to be in compliance with the North Dakota Administrative Code Section 69-06-08-0 sound level limit of 45 dBA with the proposed acoustic barrier mitigation measures at the Project substation.

Please see the Figure 1 Sound Map below, Table 1 Receptor Results and the updated Appendix K – Updated Receptor Table for more information.

I hope this memorandum is consistent with your expectations. Please contact David De Caro if you have any questions.

DNV

Figure 1 Sound Map

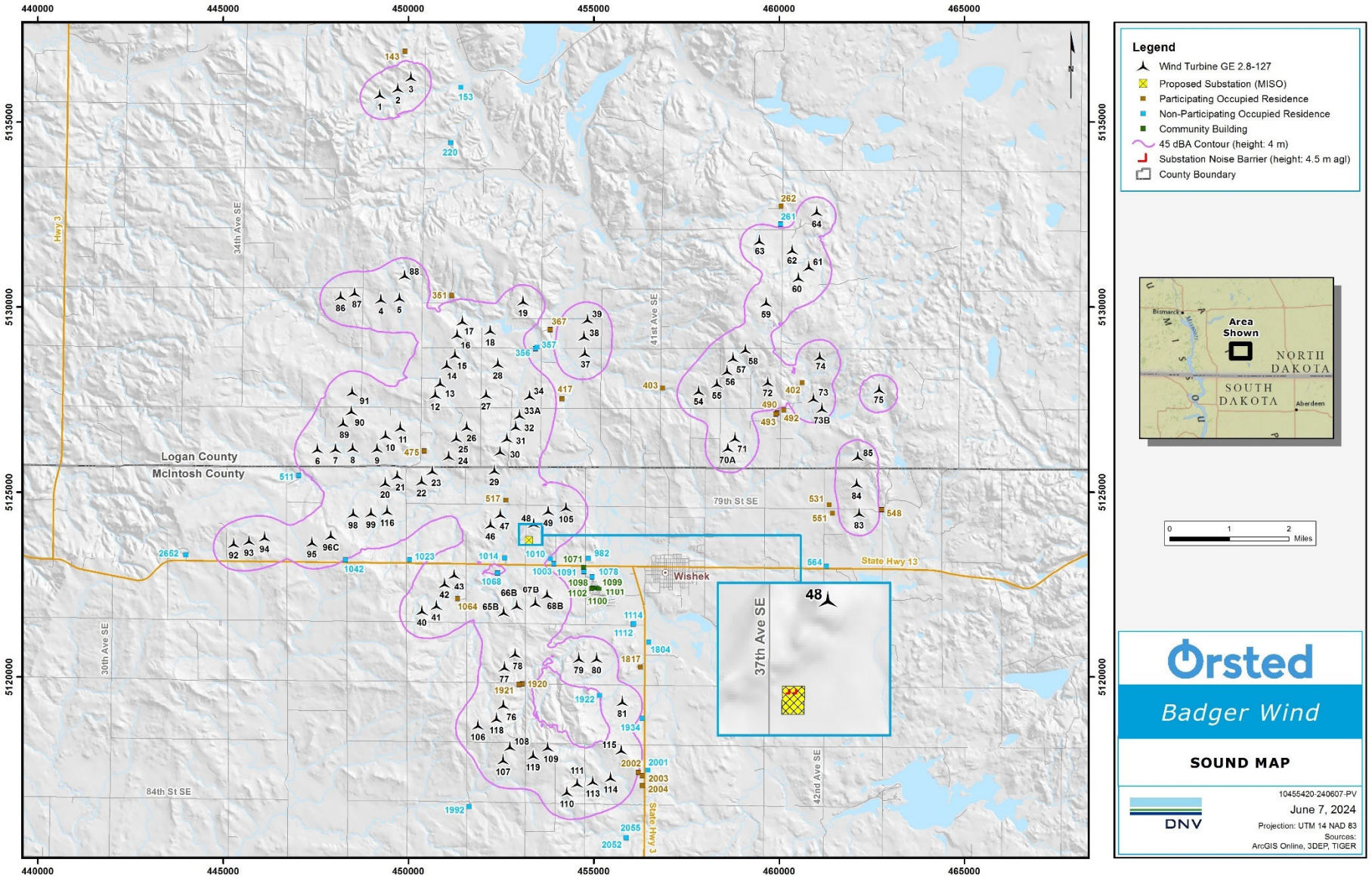

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Table 1 Receptor Results

Receptor ID	UTM Coordinates Zone 14, NAD 83 Datum		Nearest Sound Source [ID]	Distance to Nearest Sound Source [feet]	Sound Pressure Level at Receptor [dBA]	Participant Status / Waiver Status
	Easting [m]	Northing [m]				
143	449910	5136911	T3	2675	41.3	P
153	451414	5135938	T3	4440	36.2	NP
220[1]	451142	5134435	T2	6515	33.9	NP
261	460040	5132243	T63	2587	44.2	NP
262	460052	5132724	T64	3281	41.3	P
351	451171	5130311	T17	2760	44.1	P
356	453428	5128874	T28	3686	44.1	NP
357	453463	5128918	T28	3854	44.1	NP
367	453827	5129394	T38	3140	43.6	P
402	460620	5127961	T73	2007	46.1	P
403	456860	5127809	T54	3246	41.3	P
417	454147	5127522	T34	2858	43.7	P
475	450426	5126113	T23	2204	49.0	P
490	459950	5127152	T72	2501	44.2	P
492[2]	460131	5127219	T72	2568	44.5	P
493	459917	5127112	T72	2592	44.0	P
511	447037	5125452	T6	2635	44.1	NP
517	452631	5124788	T47	1652	48.5	P
531	461350	5124665	T84	2884	42.6	P
548	462767	5124527	T83	2073	44.0	P
551	461444	5124433	T83	2389	43.1	P
564	461281	5123004	T83	5239	34.3	NP
982	454849	5123219	T105	4628	40.7	NP
1003	453922	5123072	TR2	3086	44.3	Pending Waiver
1010	453837	5123201	TR2	2590	44.7	Pending Waiver
1014	452598	5123225	TR1	2681	45.5	NP Waiver obtained
1023	450024	5123180	T42	3984	43.7	NP
1042	448303	5123172	T96C	2250	44.9	NP
1064	451329	5122110	T42	1558	49.3	P
1068	452406	5122819	T66	3692	44.9	NP
1071	454729	5122962	T68B	4263	41.2	NP
1078	454738	5122856	T68B	4070	41.2	NP
1091	454957	5122712	T68B	4436	40.3	NP
1098	454969	5122422	T68B	4145	40.6	NP
1099	455092	5122408	T68B	4528	40.0	NP
1100	455124	5122382	T68B	4612	39.9	NP
1101	455138	5122382	T68B	4658	39.9	NP
1102	454951	5122389	T68B	4063	40.7	NP
1112	456064	5121418	T80	4635	38.4	NP
1114	456081	5121438	T80	4721	38.2	NP
1804	456482	5120937	T80	4917	37.7	NP
1817	456265	5120265	T81	3750	40.5	P
1920	453076	5119807	T77	1960	47.2	P
1921	452989	5119794	T77	1768	47.7	P
1922	455159	5119498	T81	2200	44.9	NP
1934	456308	5118878	T81	2101	44.0	NP
1992	451637	5116504	T107	4848	38.2	NP
2001	456463	5117481	T115	2764	42.6	NP
2002	456205	5117426	T115	2224	44.9	P
2003	456305	5117334	T115	2670	43.6	P
2004	456317	5117069	T114	2848	42.6	P
2052	455875	5115654	T114	5219	38.0	NP
2055	455871	5115671	T114	5162	38.1	NP
2652	443993	5123311	T92	4317	37.0	NP

[1] Receptor 220 has been included; however it falls outside of 1 mile radius of the nearest noise source.
[2] The sound pressure level in the case where T73B (461159.00, 5127167.00) is used in place of T73 is 44.0 dBA.