

Appendix L: Preliminary Aquatic Resource Report

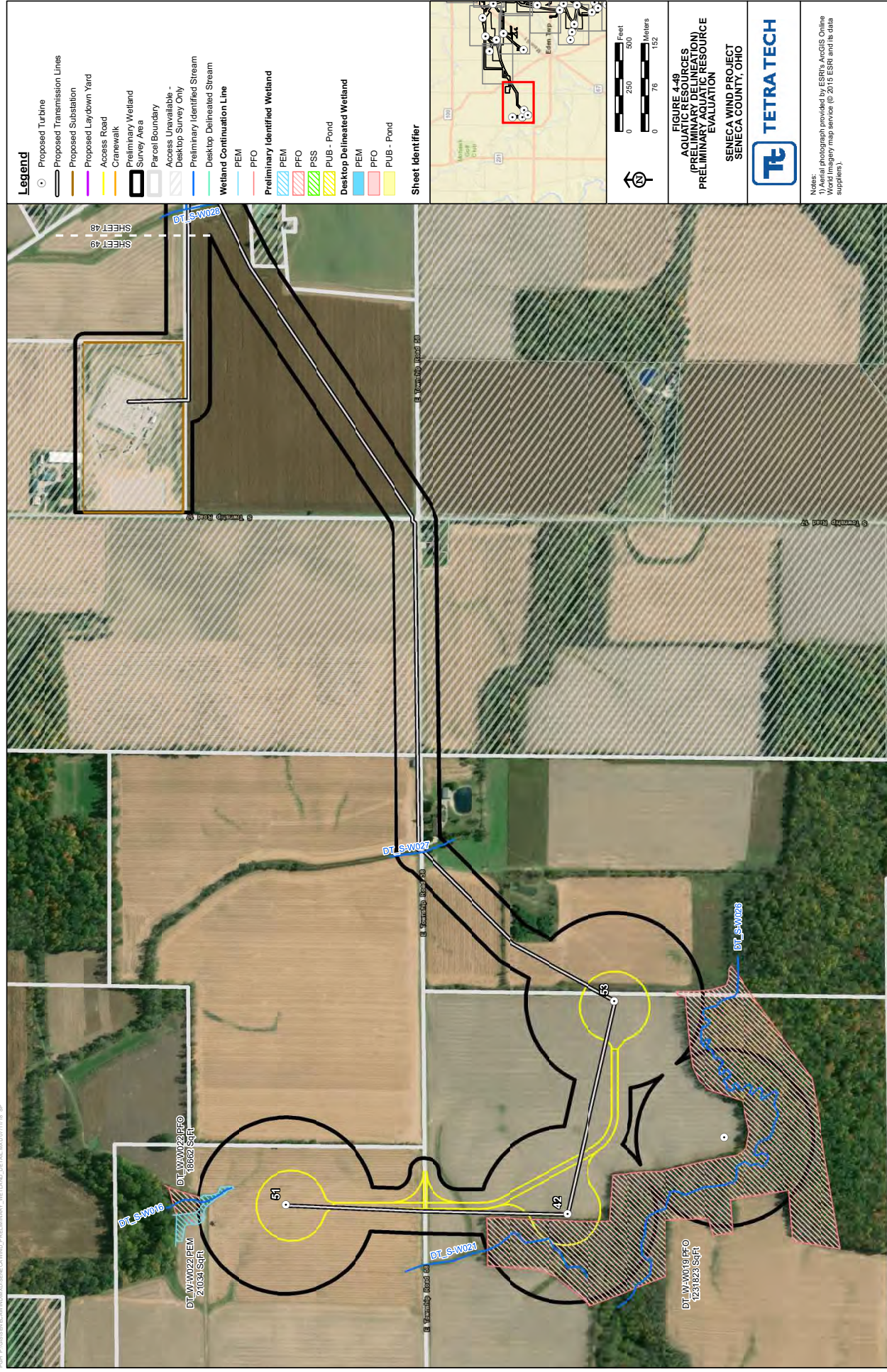


FIGURE 4-49
AQUATIC RESOURCES
(PRELIMINARY DELINEATION)
PRELIMINARY AQUATIC RESOURCE
EVALUATION

SENECA WIND PROJECT
SENECA COUNTY, OHIO



Notes:
1) Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2015 ESRI and its data suppliers).

TABLES

Table 1: Preliminary Identified Wetlands

Table 2: Preliminary Identified Streams

Table 3: Seneca County Hydric Soil List

Table 1.
Preliminary Identified Wetlands

Wetland ID	County	Latitude ¹	Longitude ¹	Cowardin Class ² †	Water Type ⁴ †	ORAM Category ⁵ †	Approximate Size (Acres) ⁶	Approximate Size (square feet) ⁶	Open/Closed Boundary	Figure(s)
DT_W-E125 PFO	Seneca	41.057241	-82.847544	PFO	NRPWW	Modified 2	4.109	178,970	Open	4-1
DT_W-E126 PEM	Seneca	41.062369	-82.837851	PEM	NRPWW	Category 1	0.052	2,252	Closed	4-2
DT_W-E077 PFO2	Seneca	41.071927	-82.844140	PFO	RPWWD	Modified 2	1.708	74,384	Closed	4-2, 4-3
DT_W-E077 PFO1	Seneca	41.072296	-82.845617	PFO	RPWWD	Category 2	15.674	682,746	Closed	4-2, 4-3, 4-4
DT_W-E081 PUB	Seneca	41.079615	-82.846925	PUB	NRPWW	Category 1	0.659	28,693	Closed	4-3
DT_W-E082 PUB	Seneca	41.080122	-82.857606	PUB	NRPWW	Category 1	1.078	46,936	Closed	4-3
DT_W-E123 PEM	Seneca	41.080191	-82.843939	PEM	NRPWW	Category 1	0.192	8,373	Closed	4-3
DT_W-E124 PEM	Seneca	41.079901	-82.843132	PEM	NRPWW	Category 1	0.069	3,025	Closed	4-3
DT_W-E076 PFO	Seneca	41.072582	-82.854403	PFO	NRPWW	Modified 2	19.218	837,117	Closed	4-3, 4-4
DT_W-E118 PEM	Seneca	41.071726	-82.855287	PEM	NRPWW	Modified 2	0.057	2,497	Closed	4-3, 4-4
DT_W-E073 PEM	Seneca	41.068031	-82.865329	PEM	RPWWD	Modified 2	0.995	43,358	Closed	4-4
DT_W-E074 PEM	Seneca	41.067135	-82.862754	PEM	RPWWD	Modified 2	0.774	33,728	Closed	4-4
DT_W-E114 PEM	Seneca	41.069632	-82.863849	PEM	NRPWW	Category 1	0.077	3,349	Closed	4-4
DT_W-E115 PEM	Seneca	41.068010	-82.863979	PEM	RPWWD	Modified 2	0.052	2,247	Closed	4-4
DT_W-E116 PEM	Seneca	41.070995	-82.861589	PEM	NRPWW	Category 2	0.364	15,844	Closed	4-4
DT_W-E071 PFO	Seneca	41.073069	-82.864102	PFO	NRPWW	Category 2	32.393	1,411,018	Open	4-4, 4-5
DT_W-E113 PEM	Seneca	41.074653	-82.865943	PEM	NRPWW	Category 2	0.046	1,988	Closed	4-4, 4-5
DT_W-E117 PEM	Seneca	41.074730	-82.861684	PEM	NRPWW	Category 2	0.712	31,020	Closed	4-4, 4-5
DT_W-E069 PUB	Seneca	41.080061	-82.879595	PUB	NRPWW	Category 1	0.551	24,016	Closed	4-5
DT_W-E072 PUB	Seneca	41.074841	-82.861039	PUB	NRPWW	Category 2	0.493	21,487	Closed	4-5
DT_W-E068 PFO	Seneca	41.075369	-82.889541	PFO	RPWWD	Modified 2	4.466	194,542	Open	4-6
DT_W-E122 PEM	Seneca	41.082742	-82.894991	PEM	RPWWD	Category 1	0.068	2,952	Closed	4-6, 4-7
DT_W-E046 PUB	Seneca	41.083279	-82.901433	PUB	NRPWW	Category 1	0.766	33,379	Closed	4-7
DT_W-W010 PEM	Seneca	41.090091	-82.903748	PEM	RPWWD	Modified 2	0.087	3,775	Closed	4-7
DT_W-W010 PEM2	Seneca	41.088035	-82.904583	PEM	RPWWD	Modified 2	0.099	4,322	Closed	4-7
DT_W-W010 PFO1	Seneca	41.087537	-82.905489	PFO	RPWWD	Modified 2	3.440	149,850	Closed	4-7
DT_W-W010 PFO2	Seneca	41.089208	-82.904218	PFO	RPWWD	Modified 2	4.225	184,047	Closed	4-7
DT_W-W010 PFO3	Seneca	41.089691	-82.903713	PFO	RPWWD	Modified 2	0.481	20,960	Closed	4-7
DT_W-W010 PFO4	Seneca	41.090259	-82.903817	PFO	RPWWD	Modified 2	0.211	9,173	Closed	4-7
DT_W-E047 PFO	Seneca	41.087723	-82.911245	PFO	NRPWW	Modified 2	18.549	807,979	Closed	4-7, 4-8
DT_W-E119 PEM	Seneca	41.086117	-82.918812	PEM	NRPWW	Modified 2	0.082	3,592	Closed	4-8
DT_W-E121 PEM	Seneca	41.089491	-82.913893	PEM	NRPWW	Category 1	0.109	4,740	Closed	4-8
DT_W-E042 PEM	Seneca	41.087460	-82.913509	PEM	NRPWW	Modified 2	0.145	6,297	Closed	4-8
DT_W-E042 PSS	Seneca	41.092703	-82.920159	PEM	RPWWD	Category 1	0.703	30,638	Closed	4-8, 4-11
DT_W-E043 PEM	Seneca	41.093104	-82.920077	PSS	RPWWD	Category 1	0.143	6,230	Closed	4-8, 4-11
DT_W-E045 PFO	Seneca	41.093268	-82.919216	PEM	RPWWD	Category 1	0.097	4,230	Closed	4-8, 4-11
DT_W-E112 PEM	Seneca	41.087158	-82.919424	PFO	NRPWW	Category 2	27.330	1,190,504	Closed	4-8, 4-11
DT_W-E112 PEM	Seneca	41.091988	-82.914347	PEM	NRPWW	Category 1	0.045	1,947	Closed	4-8, 4-12
DT_W-E048 PFO	Seneca	41.088486	-82.927461	PFO	NRPWW	Category 2	29.708	1,294,080	Closed	4-8, 4-9, 4-10
DT_W-E103 PUB	Seneca	41.081429	-82.935092	PUB	RPWWD	Category 1	0.476	20,716	Closed	4-9
DT_W-E104 PFO	Seneca	41.075207	-82.928799	PFO	RPWWD	Modified 2	0.642	27,986	Open	4-9
DT_W-E101 PFO	Seneca	41.088037	-82.943441	PFO	NRPWW	Modified 2	0.750	32,674	Open	4-9, 4-10
DT_W-E102 PUB	Seneca	41.087001	-82.940019	PUB	NRPWW	Category 1	0.443	19,292	Closed	4-9, 4-10

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Preliminary Identified Wetlands

Wetland ID	County	Latitude ¹	Longitude ¹	Cowardin Class ² †	Water Type ⁴ †	ORAM Category ⁵ †	Approximate Size (Acres) ⁶	Approximate Size (square feet) ⁶	Open/Closed Boundary	Figure(s)
DT_W-W011 PEM	Seneca	41.095526	-82.931834	PEM	NRPWW	Category 1	0.029	1,249	Closed	4-11
DT_W-E036 PFO	Seneca	41.102054	-82.921029	PFO	RPWW	Category 2	14.953	651,349	Open	4-11, 4-18
DT_W-E037 PFO1	Seneca	41.101921	-82.934128	PFO	NRPWW	Modified 2	5.789	252,183	Closed	4-11, 4-18
DT_W-E037 PFO2	Seneca	41.100149	-82.934155	PFO	NRPWW	Modified 2	5.266	229,400	Closed	4-11, 4-18
DT_W-E040 PUB	Seneca	41.094763	-82.913645	PUB	NRPWW	Category 1	1.213	52,841	Closed	4-12
DT_W-E041 PUB	Seneca	41.094263	-82.913617	PUB	NRPWW	Category 1	0.501	21,830	Closed	4-12
DT_W-E108 PFO	Seneca	41.103644	-82.898612	PFO	NRPWW	Category 2	12.461	542,807	Closed	4-12, 4-13
DT_W-E128 PFO1	Seneca	41.102075	-82.879306	PFO	RPWW	Category 2	6.404	278,962	Closed	4-13, 4-14
DT_W-E128 PFO2	Seneca	41.102096	-82.881907	PFO	RPWW	Category 2	5.535	241,096	Closed	4-13, 4-14
DT_W-E128 PFO3	Seneca	41.103224	-82.878197	PFO	RPWW	Category 2	3.035	132,208	Closed	4-13, 4-14
DT_W-E129 PFO	Seneca	41.099361	-82.888159	PFO	RPWW	Category 2	8.117	353,578	Closed	4-13, 4-14
DT_W-E110 PFO	Seneca	41.116744	-82.906468	PFO	NRPWW	Modified 2	8.622	375,580	Closed	4-15
DT_W-E111 PFO	Seneca	41.115315	-82.903674	PFO	NRPWW	Modified 2	7.115	309,929	Closed	4-15
DT_W-E106 PFO	Seneca	41.126686	-82.927656	PFO	NRPWW	Modified 2	1.605	69,907	Closed	4-16
DT_W-E107 PEM	Seneca	41.123718	-82.916466	PEM	RPWW	Modified 2	0.654	28,489	Closed	4-16, 4-17
DT_W-E109 PFO	Seneca	41.123718	-82.916466	PFO	RPWW	Modified 2	0.654	28,489	Closed	4-16, 4-17
DT_W-E131 PFO	Seneca	41.117247	-82.927898	PFO	RPWW	Category 2	2.750	119,782	Closed	4-17
DT_W-E130 PFO	Seneca	41.117680	-82.929125	PFO	RPWW	Category 2	0.765	33,325	Closed	4-17
DT_W-E035 PFO	Seneca	41.104259	-82.930308	PFO	RPWW	Category 2	19.903	866,970	Open	4-18
DT_W-E025 PUB	Seneca	41.112455	-82.955302	PUB	RPWW	Category 1	0.527	22,970	Closed	4-20
DT_W-E028 PEM	Seneca	41.112871	-82.940603	PEM	NRPWW	Category 1	0.493	21,486	Closed	4-20
DT_W-E099 PEM	Seneca	41.113422	-82.957500	PEM	NRPWW	Category 1	0.109	4,730	Closed	4-20
DT_W-E100 PEM	Seneca	41.112871	-82.957336	PEM	NRPWW	Category 1	0.184	8,004	Closed	4-20
DT_W-E024 PFO	Seneca	41.113443	-82.963160	PFO	RPWW	Modified 2	2.074	90,352	Closed	4-20, 4-21
DT_W-E022 PUB	Seneca	41.108645	-82.969995	PUB	RPWW	Category 1	0.299	13,015	Closed	4-21
DT_W-E091 PFO	Seneca	41.107082	-82.972445	PFO	RPWW	Modified 2	8.270	360,238	Closed	4-21, 4-22
DT_W-E018 PUB	Seneca	41.094253	-82.979400	PUB	NRPWW	Category 1	0.651	28,354	Closed	4-22, 4-23
DT_W-E019 PEM1	Seneca	41.100652	-82.973531	PEM	RPWW	Modified 2	2.866	124,864	Closed	4-22
DT_W-E019 PEM2	Seneca	41.098268	-82.972687	PEM	RPWW	Modified 2	0.473	20,603	Closed	4-22
DT_W-E019 PFO1	Seneca	41.099760	-82.973363	PFO	RPWW	Modified 2	2.024	88,168	Closed	4-22
DT_W-E019 PFO2	Seneca	41.101735	-82.973670	PFO	RPWW	Modified 2	3.378	147,163	Open	4-22
DT_W-E132 PFO	Seneca	41.088700	-82.971216	PFO	RPWW	Modified 2	10.975	478,063	Open	4-23
DT_W-E096 PEM	Seneca	41.083400	-82.974652	PEM	RPWW	Modified 2	0.436	18,997	Closed	4-23, 4-24
DT_W-E097 PFO	Seneca	41.082739	-82.974750	PFO	RPWW	Modified 2	1.402	61,075	Closed	4-23, 4-24
DT_W-E098 PUB	Seneca	41.082288	-82.973751	PUB	NRPWW	Category 1	0.418	18,216	Closed	4-23, 4-24
DT_W-E012 PFO2	Seneca	41.086667	-82.985014	PFO	RPWW	Modified 2	4.081	177,755	Open	4-23, 4-25
DT_W-E015 PFO	Seneca	41.089244	-82.982160	PFO	RPWW	Modified 2	5.725	249,388	Open	4-23, 4-25
DT_W-E127 PFO	Seneca	41.076005	-82.971807	PFO	RPWW	Category 2	4.827	210,243	Open	4-24
DT_W-E010 PFO1	Seneca	41.089858	-82.993923	PFO	RPWW	Modified 2	9.783	426,155	Open	4-25
DT_W-E010 PFO2	Seneca	41.086416	-82.988853	PFO	RPWW	Modified 2	2.846	123,980	Open	4-25
DT_W-E011 PEM	Seneca	41.086455	-82.987413	PEM	RPWW	Modified 2	0.153	6,649	Closed	4-25
DT_W-E012 PFO1	Seneca	41.086592	-82.986786	PFO	RPWW	Modified 2	0.138	6,028	Open	4-25
DT_W-E095 PFO	Seneca	41.089795	-83.004985	PFO	RPWW	Modified 2	2.822	122,924	Open	4-25, 4-27

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Preliminary Identified Wetlands

Wetland ID	County	Latitude ¹	Longitude ¹	Cowardin Class ² †	Water Type ⁴ †	ORAM Category ⁵ †	Approximate Size (Acres) ⁶	Approximate Size (square feet) ⁶	Open/Closed Boundary	Figure(s)
DT_W-W182 PFO	Seneca	41.100096	-82.986917	PFO	RPWWN	Modified 2	0.909	39,585	Open	4-26
DT_W-E006 PFO	Seneca	41.092103	-83.008213	PFO	RPWWD	Modified 2	0.741	32,262	Open	4-27
DT_W-E008 PFO	Seneca	41.092236	-83.005807	PFO	RPWWD	Modified 2	0.665	28,980	Open	4-27
DT_W-E093 PFO	Seneca	41.087078	-83.011137	PFO	RPWWD	Modified 2	3.978	173,279	Open	4-27
DT_W-E094 PFO	Seneca	41.088701	-83.007606	PFO	RPWWD	Modified 2	6.710	292,288	Open	4-27
DT_W-W170 PEM1	Seneca	41.088232	-83.018081	PEM	RPWWD	Category 2	0.572	24,931	Closed	4-27
DT_W-W170 PFO	Seneca	41.088116	-83.019394	PFO	RPWWD	Category 2	39.126	1,704,304	Open	4-27
DT_W-W178 PEM	Seneca	41.095376	-83.020371	PEM	NRPWW	Category 1	0.312	13,609	Closed	4-27
DT_W-W179 PFO	Seneca	41.095302	-83.020057	PFO	NRPWW	Category 1	0.198	8,627	Closed	4-27
DT_W-W180 PEM	Seneca	41.094248	-83.019845	PEM	NRPWW	Category 1	0.369	16,055	Closed	4-27
DT_W-W177 PEM	Seneca	41.108910	-83.028061	PEM	NRPWW	Category 1	0.188	8,194	Open	4-28
DT_W-W161 PEM	Seneca	41.082232	-83.036670	PEM	RPWWD	Category 1	0.240	10,457	Open	4-29
DT_W-W175 PFO	Seneca	41.075766	-83.047216	PFO	RPWWD	Modified 2	1.520	66,199	Open	4-29
DT_W-W157 PFO2	Seneca	41.074549	-83.036579	PFO	NRPWW	Category 2	14.150	616,393	Open	4-29, 4-30, 4-31
DT_W-W157 PFO1	Seneca	41.072621	-83.040592	PFO	RPWWD	Category 2	15.839	689,928	Open	4-29, 4-31
DT_W-W174 PFO	Seneca	41.074029	-83.049202	PFO	RPWWD	Modified 2	3.034	132,161	Open	4-29, 4-31
DT_W-W167 PEM1	Seneca	41.077907	-83.022639	PEM	RPWWD	Modified 2	0.161	7,031	Closed	4-30
DT_W-W167 PEM2	Seneca	41.080653	-83.017765	PEM	RPWWD	Modified 2	0.363	15,824	Closed	4-30
DT_W-W167 PFO1	Seneca	41.075923	-83.023779	PFO	RPWWD	Modified 2	23.984	1,044,760	Closed	4-30
DT_W-W167 PSS	Seneca	41.078807	-83.020637	PSS	RPWWD	Modified 2	0.928	40,445	Closed	4-30
DT_W-W168 PFO	Seneca	41.075671	-83.019937	PFO	NRPWW	Modified 2	11.506	501,184	Open	4-30
DT_W-W176 PEM	Seneca	41.076266	-83.025907	PEM	RPWWD	Modified 2	0.095	4,154	Closed	4-30
DT_W-W067 PFO	Seneca	41.058888	-83.049663	PFO	RPWWD	Category 2	40.977	1,784,949	Open	4-31, 4-32, 4-34
DT_W-W147 PEM	Seneca	41.065664	-83.062486	PEM	RPWWD	Modified 2	1.974	85,995	Closed	4-32
DT_W-W151 PEM	Seneca	41.064469	-83.060972	PEM	RPWWD	Modified 2	0.220	9,576	Closed	4-32
DT_W-W071 PFO	Seneca	41.057467	-83.063692	PFO	NRPWW	Category 2	22.800	993,166	Closed	4-32, 4-33
DT_W-W045 PFO	Seneca	41.047748	-83.074578	PFO	RPWWN	Category 2	17.955	782,122	Closed	4-33
DT_W-W070 PEM2	Seneca	41.051528	-83.068153	PEM	RPWWD	Category 2	1.229	53,549	Closed	4-33
DT_W-W070 PFO	Seneca	41.050915	-83.069338	PFO	RPWWD	Category 2	46.307	2,017,106	Closed	4-33
DT_W-W069 PFO	Seneca	41.047114	-83.059765	PFO	RPWWD	Category 2	15.098	657,645	Closed	4-33, 4-34, 4-36
DT_W-W067 PEM1	Seneca	41.052530	-83.055266	PEM	RPWWD	Modified 2	0.475	20,675	Closed	4-34
DT_W-W067 PEM3	Seneca	41.052635	-83.053323	PEM	RPWWD	Modified 2	0.720	31,359	Closed	4-34
DT_W-W068 PFO	Seneca	41.057859	-83.050617	PFO	RPWWD	Category 2	17.924	780,752	Closed	4-34
DT_W-W129 PFO	Seneca	41.053953	-83.050977	PFO	RPWWD	Category 2	2.581	112,437	Open	4-34
DT_W-W123 PFO	Seneca	41.044181	-83.037768	PFO	RPWWD	Modified 2	3.810	165,972	Closed	4-35
DT_W-W125 PEM1	Seneca	41.042069	-83.028073	PEM	RPWWD	Modified 2	2.406	104,803	Closed	4-35
DT_W-W125 PUB1	Seneca	41.041716	-83.025757	PUB	RPWWD	Modified 2	0.192	8,377	Closed	4-35
DT_W-W125 PUB2	Seneca	41.042345	-83.027531	PUB	RPWWD	Modified 2	0.108	4,724	Closed	4-35
DT_W-W125 PFO	Seneca	41.041814	-83.026438	PFO	RPWWD	Modified 2	19.296	840,512	Closed	4-35
DT_W-W183 PFO	Seneca	41.045861	-83.027449	PFO	RPWWD	Category 2	19.608	854,107	Open	4-35
DT_W-W118 PFO	Seneca	41.044601	-83.048026	PFO	RPWWN	Category 2	29.804	1,298,255	Closed	4-36
DT_W-W002 PFO 1	Seneca	41.034411	-83.063959	PFO	RPWWD	Category 2	21.460	934,774	Closed	4-36, 4-37, 4-38

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Wetland ID	County	Latitude ¹	Longitude ¹	Cowardin Class ² †	Water Type ⁴ †	ORAM Category ⁵ †	Approximate Size (Acres) ⁶	Approximate Size (square feet) ⁶	Open/Closed Boundary	Figure(s)
DT_W-W106 PEM	Seneca	41.034984	-83.055556	PEM	RPWWD	Category 2	1.199	52,211	Closed	4-36, 4-38
DT_W-W035 PEM	Seneca	41.033856	-83.077041	PEM	RPWWD	Modified 2	0.193	8,428	Closed	4-37
DT_W-W037 PFO	Seneca	41.032080	-83.081577	PFO	RPWWD	Category 2	6.086	265,123	Closed	4-37
DT_W-W041 PUB	Seneca	41.038262	-83.077278	PUB	NRPPW	Modified 2	0.383	16,677	Closed	4-37
DT_W-W037 PFO	Seneca	41.034439	-83.075419	PFO	RPWWD	Category 2	16.338	711,691	Closed	4-37
DT_W-W185 PFO	Seneca	41.038610	-83.075499	PFO	RPWWD	Category 2	5.572	242,735	Closed	4-37
DT_W-W186 PFO	Seneca	41.042368	-83.076112	PFO	RPWWD	Category 2	24.395	1,062,649	Closed	4-37
DT_W-W002 PFO 2	Seneca	41.030247	-83.067079	PFO	RPWWD	Category 2	41.422	1,804,331	Closed	4-37, 4-38
DT_W-W038 PFO	Seneca	41.034603	-83.070976	PFO	RPWWD	Category 2	2.278	99,238	Closed	4-37, 4-38
DT_W-W106 PFO	Seneca	41.033440	-83.060680	PFO	RPWWD	Category 2	5.455	237,639	Closed	4-37, 4-38
DT_W-W108 PEM	Seneca	41.034453	-83.070521	PEM	RPWWD	Category 1	0.156	6,815	Closed	4-37, 4-38
DT_W-W035 PFO	Seneca	41.031789	-83.080902	PFO	RPWWD	Category 2	13.269	578,010	Open	4-37, 4-45
DT_W-W036 PFO	Seneca	41.031559	-83.079773	PFO	RPWWD	Category 2	0.571	24,854	Closed	4-37, 4-45
DT_W-W002 PEM3	Seneca	41.025835	-83.064988	PEM	NRPPW	Category 2	1.486	64,730	Closed	4-38, 4-39
DT_W-W090 PEM	Seneca	41.023108	-83.073799	PEM	NRPPW	Category 1	0.128	5,570	Closed	4-38, 4-45
DT_W-W099 PEM	Seneca	41.026398	-83.059647	PEM	NRPPW	Category 1	0.064	2,797	Closed	4-38
DT_W-W100 PEM	Seneca	41.025814	-83.060122	PEM	NRPPW	Category 1	0.278	12,110	Open	4-38
DT_W-W101 PEM	Seneca	41.027400	-83.059327	PEM	NRPPW	Category 1	0.604	26,295	Open	4-38
DT_W-W102 PEM	Seneca	41.028928	-83.059584	PEM	NRPPW	Category 1	0.187	8,149	Open	4-38
DT_W-W066 PFO	Seneca	41.016322	-83.075049	PFO	NRPPW	Modified 2	6.311	274,892	Closed	4-39
DT_W-W181 PFO	Seneca	41.009671	-83.069369	PFO	RPWWD	Category 2	29.030	1,264,539	Closed	4-39, 4-40
DT_W-W053 PFO	Seneca	41.009491	-83.077941	PFO	RPWWD	Category 2	13.947	607,531	Closed	4-39, 4-43
DT_W-W001 PEM1	Seneca	41.016981	-83.081038	PEM	RPWWD	Modified 2	0.715	31,136	Closed	4-39, 4-44
DT_W-W052 PFO	Seneca	41.012505	-83.080326	PFO	NRPPW	Category 2	7.761	338,083	Closed	4-39, 4-44
DT_W-W001 PFO	Seneca	41.015239	-83.079243	PFO	RPWWD	Modified 2	10.162	442,655	Open	4-39, 4-44, 4-45
DT_W-W184 PFO	Seneca	41.001036	-83.059380	PFO	RPWWD	Modified 2	10.603	461,862	Open	4-40
DT_W-W054 PFO1	Seneca	41.000417	-83.078869	PFO	RPWWD	Category 2	26.459	1,152,540	Open	4-42, 4-43
DT_W-W054 PEM1	Seneca	41.003196	-83.079422	PEM	RPWWD	Modified 2	3.060	133,289	Open	4-43
DT_W-W049 PEM1	Seneca	41.012119	-83.085177	PEM	RPWWD	Modified 2	0.084	3,647	Closed	4-44
DT_W-W049 PEM2	Seneca	41.013156	-83.085777	PEM	RPWWD	Modified 2	3.852	167,796	Open	4-44
DT_W-W049 PEM3	Seneca	41.014694	-83.090513	PEM	RPWWD	Modified 2	0.627	27,322	Closed	4-44
DT_W-W049 PFO1	Seneca	41.012899	-83.085788	PFO	RPWWD	Modified 2	6.569	286,162	Closed	4-44
DT_W-W049 PFO2	Seneca	41.013879	-83.089135	PFO	RPWWD	Modified 2	0.783	34,093	Closed	4-44
DT_W-W050 PEM	Seneca	41.011327	-83.082078	PEM	NRPPW	Category 1	0.544	23,700	Closed	4-44
DT_W-W172 PEM	Seneca	41.038621	-83.103073	PEM	NRPPW	Category 1	0.325	14,154	Closed	4-46
DT_W-W032 PEM	Seneca	41.045038	-83.084752	PEM	RPWWD	Modified 2	0.246	10,694	Closed	4-46, 4-47
DT_W-W032 PUB	Seneca	41.045046	-83.084799	PUB	NRPPW	Modified 2	0.192	8,359	Closed	4-46, 4-47
DT_W-W028 PFO	Seneca	41.044195	-83.101781	PFO	RPWWD	Category 2	13.454	586,053	Open	4-46, 4-47, 4-48
DT_W-W034 PFO	Seneca	41.046207	-83.084418	PFO	NRPPW	Modified 2	1.140	49,644	Closed	4-47
DT_W-W173 PFO	Seneca	41.053131	-83.087780	PFO	NRPPW	Modified 2	5.448	237,333	Open	4-47
DT_W-W027 PFO	Seneca	41.047323	-83.104437	PFO	RPWWD	Category 2	6.300	274,441	Closed	4-47, 4-48
DT_W-W026 PFO	Seneca	41.042958	-83.117914	PFO	NRPPW	Modified 2	0.650	28,300	Closed	4-48
DT_W-W189 PUB	Seneca	41.051839	-83.112107	PUB	NRPPW	Category 1	0.215	9,372	Closed	4-48

**Table 1.
Preliminary Identified Wetlands**

Wetland ID	County	Latitude ¹	Longitude ¹	Cowardin Class ^{2 †}	Water Type ^{4 †}	ORAM Category ^{5 †}	Approximate Size (Acres) ⁶	Approximate Size (square feet) ⁶	Open/Closed Boundary	Figure(s)
DT_W-W187 PFO	Seneca	41.051782	-83.109601	PFO	RPWWD	Modified 2	4.100	178,591	Open	4-48
DT_W-W188 PFO	Seneca	41.043216	-83.121981	PFO	RPWWD	Modified 2	4.666	203,242	Open	4-48
DT_W-W022 PEM	Seneca	41.040184	-83.146156	PEM	RPWWD	Modified 2	0.483	21,034	Open	4-49
DT_W-W022 PFO	Seneca	41.040405	-83.145909	PFO	RPWWD	Modified 2	0.428	18,662	Open	4-49
DT_W-W019 PFO	Seneca	41.032725	-83.144769	PFO	RPWWD	Category 2	28.279	1,231,823	Open	4-49

Notes:

- 1** - In decimal degrees. Coordinates correlate with centroid of wetland polygon.
- 2** - Applicable Cowardin Classes.
 - PFO = Palustrine Forested
 - PSS = Palustrine Scrub-Shrub
 - PEM = Palustrine Emergent
 - PUB = Palustrine Unconsolidated Bottom [Pond]
- 3** - Applicable Water Types.
 - RPWWD = Wetlands directly abutting Relatively Permanent Waters (RPWs) that flow directly or indirectly into Traditional Navigable Waterways (TNWs)
 - RPWWN = Wetlands adjacent but not directly abutting RPWs that flow directly or indirectly into TNWs
 - NRPWW = Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
- 4** - Mack, John J. 2001. Ohio Rapid Assessment Method for Wetlands, Manual for Using Version 5.0. Ohio EPA Technical Bulletin Wetland/2001-1-1. Ohio Environmental Protection Agency, Division of Surface Water, 401 Wetland Ecology Unit, Columbus, Ohio.
- 5** - Size of wetlands with open boundaries may be larger than shown in this table. See Section 3.1 for more information.
- †** - Preliminary wetland Cowardin Class, Water Type, and ORAM Categories were assigned based on best professional judgement and extensive previous experience with Ohio-EPA evaluation methods. Feature specific evaluations will be completed and scores calculated once a final aquatic resource evaluation is completed.

Table 2.
Preliminary Identified Streams

Stream ID	NHD Stream Name ¹	County	Latitude ²	Longitude ²	Flow Regime [†]	Water Type ^{3†}	HHEI Class / QHEI Narrative Rating ^{5†}	Chapter 3745-1 Designations ⁶	Figure(s)
DT_S-E138	Hopper Ditch	Seneca	41.058390	-82.852543	Perennial	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-1
DT_S-E111	UNT to Sandhill Creek	Seneca	41.075299	-82.843086	Perennial	RPW	<i>Poor</i>	WWH, PCR, AWS, IWS	4-2, 4-3
DT_S-E112	UNT to Sandhill Creek	Seneca	41.074204	-82.842482	Perennial	RPW	<i>Poor</i>	WWH, PCR, AWS, IWS	4-3
DT_S-E119	UNT to Sandhill Creek	Seneca	41.072877	-82.845551	Intermittent	RPW	Class II	WWH, PCR, AWS, IWS	4-3, 4-4
DT_S-E121	UNT to Sandhill Creek	Seneca	41.080229	-82.844210	Ephemeral	NRPW	Modified Class I	WWH, PCR, AWS, IWS	4-3
DT_S-E105	Hopper Ditch	Seneca	41.066758	-82.860993	Perennial	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-4
DT_S-E061	UNT to Honey Creek	Seneca	41.082506	-82.896621	Intermittent	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-6, 4-7
DT_S-E062	UNT to Honey Creek	Seneca	41.083541	-82.897434	Intermittent	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-6, 4-7
DT_S-E137	UNT to Honey Creek	Seneca	41.090019	-82.902028	Ephemeral	NRPW	Modified Class I	WWH, PCR, AWS, IWS	4-7
DT_S-W013	UNT to Honey Creek	Seneca	41.085708	-82.906549	Intermittent	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-7, 4-8
DT_S-E054	UNT to Rock Creek	Seneca	41.093235	-82.919191	Intermittent	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-8, 4-11
DT_S-E063	UNT to Honey Creek	Seneca	41.083809	-82.930132	Perennial	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-8, 4-9
DT_S-E068	UNT to Honey Creek	Seneca	41.085883	-82.929163	Ephemeral	NRPW	Modified Class I	WWH, PCR, AWS, IWS	4-8, 4-9
DT_S-E074	UNT to Honey Creek	Seneca	41.084678	-82.931428	Ephemeral	NRPW	Modified Class I	WWH, PCR, AWS, IWS	4-8, 4-9
DT_S-E052	UNT to Rock Creek	Seneca	41.095441	-82.908860	Ephemeral	NRPW	Modified Class I	WWH, PCR, AWS, IWS	4-12
DT_S-E139	UNT to Mud Run	Seneca	41.101660	-82.882039	Intermittent	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-13, 4-14
DT_S-E129	UNT to Sandhill Creek	Seneca	41.105026	-82.875058	Intermittent	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-14
DT_S-E130	UNT to Sandhill Creek	Seneca	41.104823	-82.875516	Intermittent	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-14
DT_S-E136	UNT to Rock Creek	Seneca	41.125932	-82.922208	Perennial	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-16, 4-17
DT_S-E041	UNT to Rock Creek	Seneca	41.102371	-82.922710	Intermittent	RPW	Class II	WWH, PCR, AWS, IWS	4-18
DT_S-E042	UNT to Rock Creek	Seneca	41.102722	-82.921222	Intermittent	RPW	Class II	WWH, PCR, AWS, IWS	4-18
DT_S-W001	UNT to Rock Creek	Seneca	41.108013	-82.935870	Ephemeral	NRPW	Modified Class I	WWH, PCR, AWS, IWS	4-18
DT_S-E039	UNT to Rock Creek	Seneca	41.097233	-82.942672	Ephemeral	NRPW	Modified Class I	WWH, PCR, AWS, IWS	4-19
DT_S-E026	Porter Ditch	Seneca	41.114237	-82.957397	Perennial	RPW	<i>Fair</i>	WWH, PCR, AWS, IWS	4-20
DT_S-E029	UNT to Porter Ditch	Seneca	41.113433	-82.957480	Ephemeral	NRPW	Modified Class I	WWH, PCR, AWS, IWS	4-20
DT_S-E030	UNT to Porter Ditch	Seneca	41.112873	-82.957348	Ephemeral	NRPW	Modified Class I	WWH, PCR, AWS, IWS	4-20
DT_S-E034	UNT to Rock Creek	Seneca	41.112923	-82.940613	Ephemeral	NRPW	Modified Class I	WWH, PCR, AWS, IWS	4-20
DT_S-E022	UNT to Porter Ditch	Seneca	41.108341	-82.970650	Intermittent	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-21
DT_S-E023	UNT to Porter Ditch	Seneca	41.107632	-82.972082	Intermittent	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-21, 4-22
DT_S-E017	UNT to Porter Ditch	Seneca	41.099497	-82.972840	Intermittent	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-22
DT_S-E133	UNT to Honey Creek	Seneca	41.083091	-82.975820	Intermittent	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-23, 4-25
DT_S-E134	UNT to Honey Creek	Seneca	41.083303	-82.974822	Intermittent	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-23, 4-24
DT_S-E135	Honey Creek	Seneca	41.076179	-82.971855	Perennial	RPW	<i>Fair</i>	WWH, PCR, AWS, IWS	4-24
DT_S-E011	UNT to Honey Creek	Seneca	41.086406	-82.988748	Intermittent	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-25
DT_S-E012	UNT to Honey Creek	Seneca	41.086193	-82.985919	Intermittent	RPW	Class II	WWH, PCR, AWS, IWS	4-25
DT_S-E001	UNT to East Branch Rock Creek	Seneca	41.092483	-83.011542	Intermittent	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-27
DT_S-E003	UNT to East Branch Rock Creek	Seneca	41.092132	-83.008110	Intermittent	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-27
DT_S-E008	UNT to East Branch Rock Creek	Seneca	41.092872	-83.006714	Intermittent	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-27
DT_S-W195	UNT to East Branch Rock Creek	Seneca	41.088866	-83.019072	Intermittent	RPW	Class II	WWH, PCR, AWS, IWS	4-27
DT_S-W182	UNT to East Branch Rock Creek	Seneca	41.081957	-83.035983	Intermittent	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-29, 4-30

Table 2.
Preliminary Identified Streams

Stream ID	NHD Stream Name ¹	County	Latitude ²	Longitude ²	Flow Regime [†]	Water Type ^{3†}	HHEI Class / QHEI Narrative Rating ^{5†}	Chapter 3745-1 Designations ⁶	Figure(s)
DT_S-W183	UNT to East Branch Rock Creek	Seneca	41.084962	-83.035980	Ephemeral	RPW	Modified Class I	WWH, PCR, AWS, IWS	4-29
DT_S-W205	UNT to East Branch Rock Creek	Seneca	41.085426	-83.032646	Ephemeral	RPW	Modified Class I	WWH, PCR, AWS, IWS	4-29
DT_S-W211	UNT to East Branch Rock Creek	Seneca	41.074411	-83.049339	Intermittent	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-29, 4-31
DT_S-W212	UNT to Honey Creek	Seneca	41.075934	-83.048571	Intermittent	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-29
DT_S-W185	UNT to Honey Creek	Seneca	41.077971	-83.022457	Perennial	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-30
DT_S-W186	UNT to Honey Creek	Seneca	41.075426	-83.023538	Intermittent	RPW	Class II	WWH, PCR, AWS, IWS	4-30
DT_S-W187	UNT to Honey Creek	Seneca	41.075145	-83.024699	Intermittent	RPW	Class II	WWH, PCR, AWS, IWS	4-30
DT_S-W189	UNT to Honey Creek	Seneca	41.078153	-83.023400	Ephemeral	RPW	Modified Class I	WWH, PCR, AWS, IWS	4-30
DT_S-W136	UNT to Honey Creek	Seneca	41.060728	-83.045808	Perennial	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-31, 4-34
DT_S-W136.2	UNT to Honey Creek	Seneca	41.067504	-83.038741	Perennial	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-31
DT_S-W144	UNT to Honey Creek	Seneca	41.060358	-83.051906	Ephemeral	RPW	Modified Class I	WWH, PCR, AWS, IWS	4-31, 4-34
DT_S-W150	UNT to East Branch Rock Creek	Seneca	41.065466	-83.061920	Intermittent	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-32
DT_S-W152	UNT to East Branch Rock Creek	Seneca	41.063994	-83.060618	Ephemeral	RPW	Modified Class I	WWH, PCR, AWS, IWS	4-32
DT_S-W155	UNT to East Branch Rock Creek	Seneca	41.066739	-83.064492	Ephemeral	RPW	Modified Class I	WWH, PCR, AWS, IWS	4-32
DT_S-W156	UNT to East Branch Rock Creek	Seneca	41.067500	-83.066404	Ephemeral	RPW	Modified Class I	WWH, PCR, AWS, IWS	4-32
DT_S-W157	UNT to East Branch Rock Creek	Seneca	41.064177	-83.068629	Ephemeral	RPW	Modified Class I	WWH, PCR, AWS, IWS	4-32
DT_S-W161	UNT to East Branch Rock Creek	Seneca	41.061597	-83.072583	Ephemeral	RPW	Modified Class I	WWH, PCR, AWS, IWS	4-32
DT_S-W209	UNT to Honey Creek	Seneca	41.053501	-83.055140	Intermittent	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-32, 4-34
DT_S-W035	Honey Creek	Seneca	41.034166	-83.079077	Perennial	RPW	Good	WWH, PCR, AWS, IWS	4-33, 4-34, 4-36, 4-37
DT_S-W035	Honey Creek	Seneca	41.052029	-83.052751	Perennial	RPW	Good	WWH, PCR, AWS, IWS	4-33, 4-34, 4-36, 4-37
DT_S-W208	UNT to Honey Creek	Seneca	41.052105	-83.059459	Intermittent	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-33, 4-34
DT_S-W003a	UNT to Honey Creek	Seneca	41.051556	-83.054856	Intermittent	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-34
DT_S-W210	UNT to Honey Creek	Seneca	41.056509	-83.051269	Intermittent	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-34
DT_S-W093	UNT to Honey Creek	Seneca	41.047783	-83.028790	Intermittent	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-35
DT_S-W098	UNT to Honey Creek	Seneca	41.042385	-83.027569	Intermittent	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-35
DT_S-W099	UNT to Honey Creek	Seneca	41.041876	-83.026633	Intermittent	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-35
DT_S-W042	UNT to Honey Creek	Seneca	41.033952	-83.064452	Perennial	RPW	Fair	WWH, PCR, AWS, IWS	4-36, 4-37, 4-38
DT_S-W015	UNT to Honey Creek	Seneca	41.026177	-83.063511	Perennial	RPW	Fair	WWH, PCR, AWS, IWS	4-37, 4-38, 4-39
DT_S-W035-BRAID	Honey Creek	Seneca	41.031369	-83.079588	Perennial	RPW	Good	WWH, PCR, AWS, IWS	4-37, 4-45
DT_S-W037	UNT to Honey Creek	Seneca	41.034156	-83.077860	Perennial	RPW	Fair	WWH, PCR, AWS, IWS	4-37
DT_S-W043	UNT to Honey Creek	Seneca	41.035607	-83.072546	Ephemeral	RPW	Modified Class I	WWH, PCR, AWS, IWS	4-37, 4-38
DT_S-W071	UNT to Honey Creek	Seneca	41.031430	-83.073920	Intermittent	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-37, 4-38, 4-45
DT_S-W052	UNT to Honey Creek	Seneca	41.022360	-83.076003	Intermittent	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-38, 4-39, 4-45
DT_S-W014	UNT to Honey Creek	Seneca	41.015486	-83.079377	Perennial	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-39, 4-44, 4-45
DT_S-W070	UNT to Honey Creek	Seneca	41.022644	-83.077597	Ephemeral	RPW	Modified Class I	WWH, PCR, AWS, IWS	4-39, 4-45
DT_S-W059	UNT to Honey Creek	Seneca	41.001138	-83.076667	Intermittent	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-43
DT_S-W060	UNT to Honey Creek	Seneca	41.004000	-83.079984	Intermittent	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-43
DT_S-W061	UNT to Honey Creek	Seneca	41.008174	-83.092540	Intermittent	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-43, 4-44
DT_S-W056	UNT to Honey Creek	Seneca	41.013965	-83.088359	Intermittent	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-44
DT_S-W057	UNT to Honey Creek	Seneca	41.013521	-83.087542	Intermittent	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-44

Table 2.
Preliminary Identified Streams

Stream ID	NHD Stream Name ¹	County	Latitude ²	Longitude ²	Flow Regime [†]	Water Type ^{3†}	HHEI Class / QHEI Narrative Rating ^{5†}	Chapter 3745-1 Designations ⁶	Figure(s)
DT_S-W058	UNT to Honey Creek	Seneca	41.014549	-83.086086	Ephemeral	NRPW	Modified Class I	WWH, PCR, AWS, IWS	4-44
DT_S-W007	UNT to Honey Creek	Seneca	41.045755	-83.104866	Intermittent	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-46, 4-47, 4-48
DT_S-W017	UNT to Honey Creek	Seneca	41.044023	-83.102305	Intermittent	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-46
DT_S-W019	UNT to Honey Creek	Seneca	41.043489	-83.102670	Intermittent	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-46, 4-48
DT_S-W020	UNT to Honey Creek	Seneca	41.043637	-83.101656	Intermittent	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-46
DT_S-W006	UNT to Honey Creek	Seneca	41.049088	-83.106055	Intermittent	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-47, 4-48
DT_S-W207	UNT to Honey Creek	Seneca	41.054243	-83.093839	Intermittent	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-47
DT_S-W028	UNT to Honey Creek	Seneca	41.040011	-83.125388	Intermittent	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-48, 4-49
DT_S-W029	UNT to Honey Creek	Seneca	41.040395	-83.124403	Ephemeral	NRPW	Modified Class I	WWH, PCR, AWS, IWS	4-48, 4-49
DT_S-W016	UNT to Honey Creek	Seneca	41.040191	-83.145913	Intermittent	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-49
DT_S-W021	UNT to Honey Creek	Seneca	41.035356	-83.146537	Intermittent	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-49
DT_S-W027	UNT to Honey Creek	Seneca	41.036755	-83.138691	Perennial	RPW	Modified Class II	WWH, PCR, AWS, IWS	4-49
DT_S-W026	UNT to Honey Creek	Seneca	41.031218	-83.143995	Perennial	RPW	Class II	WWH, PCR, AWS, IWS	4-49

Notes:

- 1 - For identified streams without a NHD (National Hydrography Dataset) name, the identified stream was given the name, "Unnamed Tributary (UNT)", of the first named receiving waterbody.
 - 2 - In decimal degrees
 - 3 - Applicable Water Types
 - RPW = Relatively Permanent Waters
 - NRPW = Non-Relatively Permanent Waters
 - TNW = Traditional Navigable Waters
 - 4 - See Cowardin et al., 1979
 - 5 - Ohio EPA. 2012. Field Evaluation Manual for Ohio's Primary Headwater Habitat Streams (HHEI). Version 3.0. Ohio EPA Division of Surface Water, Columbus, Ohio.
 - 6 - Ohio EPA. 2006. Methods for Assessing Habitat in Flowing Waters: Using the Qualitative Habitat Evaluation Index (QHEI). Ohio EPA Technical Bulletin EAS/2006-06-1. Ohio EPA Division of Surface Water, Groveport, Ohio.
 - 6 - OAC Chapter 3745-1 Beneficial Use Designations:
 - AWS = Agricultural Water Supply
 - IWS = Industrial Water Supply
 - MWH = Modified Warmwater Habitat
 - PCR = Primary Contact Recreation
 - WWH = Warmwater Habitat
- † Preliminary stream Flow Regimes, Water Types, HHEI classes and QHEI narrative ratings were assigned based on best professional judgement and extensive previous experience with Ohio-EPA evaluation methods. Feature specific evaluations will be completed and scores calculated once a final aquatic resource evaluation is completed.

Table 3.
Seneca County Hydric Soil List
Seneca County, OH

Map Unit Symbol	Map Unit Name	Component Name and Phase	Component Percent	Landforms
AdA	Adrian muck, drained, 0 to 1 percent slopes	Adrian, drained	95	depressions
AdA	Adrian muck, drained, 0 to 1 percent slopes	Mermill, drained	3	depressions
AdA	Adrian muck, drained, 0 to 1 percent slopes	Granby, drained	2	depressions
BgA	Bennington silt loam, 0 to 2 percent slopes	Condit	5	drainageways
BgA	Bennington silt loam, 0 to 2 percent slopes	Pewamo, low carbonate till	3	depressions
BgB	Bennington silt loam, 2 to 6 percent slopes	Condit	3	drainageways
BgB	Bennington silt loam, 2 to 6 percent slopes	Pewamo, low carbonate till	3	depressions
BhA	Bixler loamy fine sand, 0 to 2 percent slopes	Colwood	4	depressions
Ble1A1	Blount silt loam, end moraine, 0 to 2 percent slopes	Pewamo, end moraine	6	end moraines
Ble1B1	Blount silt loam, end moraine, 2 to 4 percent slopes	Pewamo, end moraine	6	end moraines
Blg1A1	Blount silt loam, ground moraine, 0 to 2 percent slopes	Pewamo, ground moraine	9	ground moraines
Blg1B1	Blount silt loam, ground moraine, 2 to 4 percent slopes	Pewamo, ground moraine	9	ground moraines
Bp	Bono silty clay, loamy substratum	Bono	90	flats
Bp	Bono silty clay, loamy substratum	Pandora	5	drainageways
Bp	Bono silty clay, loamy substratum	Lenawee	5	depressions
BrA	Blount-Houcktown complex, 0 to 3 percent slopes	Pewamo	5	depressions
BsA	Blount-Urban land complex, 0 to 2 percent slopes	Typic Endoaquents, till substratum	6	till plains
BtA	Bogart loam, 0 to 2 percent slopes	Olmsted	5	depressions
BtA	Bogart loam, 0 to 2 percent slopes	Colwood	5	depressions
Ca	Carlisle muck, Central Ohio clayey till plain, 0 to 2 percent slopes	Carlisle	85	depressions
Ca	Carlisle muck, Central Ohio clayey till plain, 0 to 2 percent slopes	Linwood	9	depressions
Ca	Carlisle muck, Central Ohio clayey till plain, 0 to 2 percent slopes	Pewamo	6	depressions
CdB2	Cardington silt loam, 2 to 6 percent slopes, moderately eroded	Pewamo	4	drainageways

**Table 3.
Seneca County Hydric Soil List
Seneca County, OH**

CdB2	Cardington silt loam, 2 to 6 percent slopes, moderately eroded	Marengo	4	drainageways
CdC2	Cardington silt loam, 6 to 12 percent slopes, moderately eroded	Pewamo	4	drainageways
CdC2	Cardington silt loam, 6 to 12 percent slopes, moderately eroded	Marengo	3	drainageways
CnA	Channahon silt loam, 0 to 2 percent slopes	Millsdale	4	flats
Co	Colwood silt loam	Colwood	85	lake plains
Co	Colwood silt loam	Millgrove	3	depressions
Co	Colwood silt loam	Millsdale	3	depressions
Co	Colwood silt loam	Hoytville	3	flats
Cp	Colwood fine sandy loam	Colwood	90	flats
Cp	Colwood fine sandy loam	Lenawee	2	flats
CvA	Cygnat loam, 0 to 2 percent slopes	Alvada	10	depressions
DeA	Del Rey silt loam, 0 to 2 percent slopes	Bono	2	depressions
DeA	Del Rey silt loam, 0 to 2 percent slopes	Milford	2	depressions
DmA	Digby loam, 1 to 4 percent slopes	Millgrove	5	depressions
DnA	Digby loam, 0 to 3 percent slopes	Mermill	2	swales
DnA	Digby loam, 0 to 3 percent slopes	Colwood	2	swales
DnA	Digby loam, 0 to 3 percent slopes	Millgrove	2	swales
DrB	Dunbridge sandy loam, 1 to 4 percent slopes	Millsdale	2	depressions
FbA	Fitchville silt loam, 0 to 2 percent slopes	Luray	5	depressions
FbA	Fitchville silt loam, 0 to 2 percent slopes	Colwood	5	depressions
FbA	Fitchville silt loam, 0 to 2 percent slopes	Milford	4	depressions
FcA	Fitchville silt loam, 1 to 4 percent slopes	Colwood	2	depressions
Ge	Genesee silt loam, occasionally flooded	Sloan	7	abandoned channels
GfA	Gilford mucky loam, 0 to 1 percent slopes	Gilford	90	outwash plains
GfA	Gilford mucky loam, 0 to 1 percent slopes	More rock fragments in the substratum	0	outwash plains
GfA	Gilford mucky loam, 0 to 1 percent slopes	Dark colored surface layer less than 10 inches thick	0	outwash plains
GfA	Gilford mucky loam, 0 to 1 percent slopes	Thicker solum with more clay and less sand	0	outwash plains

**Table 3.
Seneca County Hydric Soil List
Seneca County, OH**

GfA	Gilford mucky loam, 0 to 1 percent slopes	Fine sandy loam surface layer	0	outwash plains
GhB	Glenford silt loam, 2 to 6 percent slopes	Colwood	4	depressions
GwA	Glynwood silt loam, 0 to 2 percent slopes	Pewamo	3	drainageways
GwA	Glynwood silt loam, 0 to 2 percent slopes	Pandora	3	drainageways
Gwe1B1	Glynwood silt loam, end moraine, 2 to 6 percent slopes	Pewamo	6	end moraines
Gwe5B2	Glynwood clay loam, end moraine, 2 to 6 percent slopes, eroded	Pewamo	6	end moraines
Gwg1B1	Glynwood silt loam, ground moraine, 2 to 6 percent slopes	Pewamo	6	ground moraines
Gwg5B2	Glynwood clay loam, ground moraine, 2 to 6 percent slopes, eroded	Pewamo	6	ground moraines
Gwg5C2	Glynwood clay loam, ground moraine, 6 to 12 percent slopes, eroded	Pewamo	7	till plains
HbB	Haskins sandy loam, 1 to 4 percent slopes	Hoytville	3	drainageways
HbB	Haskins sandy loam, 1 to 4 percent slopes	Mermill	2	drainageways
HcA	Hoytville silty clay loam, 0 to 1 percent slopes	Hoytville	91	flats
HkA	Haskins loam, 0 to 2 percent slopes	Pandora	5	drainageways
HkB	Haskins loam, 2 to 6 percent slopes	Pandora	5	drainageways
HnB	Houcktown loam, 2 to 6 percent slopes	Pewamo	6	depressions
HnB	Houcktown loam, 2 to 6 percent slopes	Mermill	3	depressions
HoA	Hoytville clay loam, 0 to 1 percent slopes	Hoytville	91	flats
HyA	Hoytville-Urban land complex, 0 to 1 percent slopes	Hoytville	60	flats
JtA	Jimtown loam, 0 to 3 percent slopes	Colwood	5	depressions
KbA	Kibbie fine sandy loam, 0 to 2 percent slopes	Hoytville	5	depressions
KcA	Kibbie-Blount complex, 0 to 2 percent slopes	Pewamo	5	drainageways
KcA	Kibbie-Blount complex, 0 to 2 percent slopes	Pandora	4	drainageways
KcA	Kibbie-Blount complex, 0 to 2 percent slopes	Colwood	4	drainageways
KcA	Kibbie-Blount complex, 0 to 2 percent slopes	Milford	4	drainageways
Le	Lenawee silty clay loam	Lenawee	95	depressions
Le	Lenawee silty clay loam	Pandora	3	drainageways
Le	Lenawee silty clay loam	Bono	2	drainageways

Table 3.
Seneca County Hydric Soil List
Seneca County, OH

Lw	Linwood muck		Linwood	90	depressions
Lw	Linwood muck		Colwood	5	depressions
Lw	Linwood muck		Millgrove	5	depressions
LzB	Lykens-Milton silt loams, 2 to 6 percent slopes		Pewamo	5	till plains
MbA	Mermill loam, 0 to 1 percent slopes		Mermill	90	flats
MbA	Mermill loam, 0 to 1 percent slopes		Till at 40 to 60 inches	0	flats
MbA	Mermill loam, 0 to 1 percent slopes		More clay and less sand in the subsoil	0	flats
MbA	Mermill loam, 0 to 1 percent slopes		Surface layer more than 10 inches thick	0	flats
MbA	Mermill loam, 0 to 1 percent slopes		Clay loam or silty clay loam surface layer	0	flats
MdA	Mermill-Urban land complex, 0 to 1 percent slopes		Mermill	60	flats
MdA	Mermill-Urban land complex, 0 to 1 percent slopes		Sandy clay loam or clay loam surface layer	0	flats
MdA	Mermill-Urban land complex, 0 to 1 percent slopes		More clay in the subsoil	0	flats
MdA	Mermill-Urban land complex, 0 to 1 percent slopes		Surface layer more than 10 inches thick	0	flats
MdA	Mermill-Urban land complex, 0 to 1 percent slopes		Till at 40 to 60 inches	0	flats
Me	Mermill loam		Mermill	85	flats
Me	Mermill loam		Millgrove	7	depressions
Mf	Millgrove loam		Millgrove	95	depressions
Mg	Millgrove silt loam		Millgrove	85	outwash plains
Mg	Millgrove silt loam		Luray	4	depressions
Mg	Millgrove silt loam		Milford	3	depressions
Mg	Millgrove silt loam		rarely flooded areas	0	flood plains
Mh	Milford silty clay loam		Milford	85	flats
Mh	Milford silty clay loam		Olentangy	3	depressions
MkA	Millsdale silty clay loam, 0 to 1 percent slopes		Millsdale	90	flats
MkA	Millsdale silty clay loam, 0 to 1 percent slopes		Clay loam, silt loam or loam surface layer	0	flats
MkA	Millsdale silty clay loam, 0 to 1 percent slopes		Surface layer more than 10 inches thick	0	flats

**Table 3.
Seneca County Hydric Soil List
Seneca County, OH**

MkA	Millsdale silty clay loam, 0 to 1 percent slopes	Bedrock at 40 to 60 inches	0	flats
MkA	Millsdale silty clay loam, 0 to 1 percent slopes	Millgrove	0	lake plains
MkA	Millsdale silty clay loam, 0 to 1 percent slopes	Joliet	0	lake plains
MkA	Millsdale silty clay loam, 0 to 1 percent slopes	Lighter colored surface layer	0	flats
MkA	Millsdale silty clay loam, 0 to 1 percent slopes	Hoytville	0	lake plains
Mm	Millsdale silty clay loam	Millsdale	85	depressions
Mm	Millsdale silty clay loam	Hoytville	5	lake plains
Mm	Millsdale silty clay loam	Lenawee	5	depressions
MoA	Milton variant loam, 0 to 2 percent slopes	Millsdale	5	depressions
MoA	Milton variant loam, 0 to 2 percent slopes	Colwood	5	depressions
MoB	Milton variant loam, 2 to 6 percent slopes	Millsdale	7	depressions
NaA	Nappanee loam, 0 to 2 percent slopes	Hoytville	10	depressions
NoA	Nappanee silt loam, 0 to 3 percent slopes	Hoytville	5	depressions
NpA	Nappanee silt loam, 0 to 2 percent slopes	Hoytville	5	depressions
NpB	Nappanee silt loam, 2 to 6 percent slopes	Hoytville	5	depressions
NrA	Nappanee silty clay loam, 0 to 2 percent slopes	Hoytville	10	depressions
NsA	Nappanee-Urban land complex, 0 to 2 percent slopes	Hoytville	10	depressions
OnC2	Oshtemo fine sandy loam, 6 to 18 percent slopes, eroded	Millgrove	6	depressions
Pa	Pandora silt loam	Pandora	85	depressions
Pa	Pandora silt loam	Pewamo	4	depressions
Pa	Pandora silt loam	Lenawee	3	depressions
Pb	Pandora silty clay loam	Pandora	85	depressions
Pb	Pandora silty clay loam	shale bedrock within 60 inches	5	depressions
Pb	Pandora silty clay loam	small closed depressions	5	depressions
Pm	Pewamo silty clay loam, 0 to 1 percent slopes	Pewamo	85	depressions
Pm	Pewamo silty clay loam, 0 to 1 percent slopes	Minster	6	depressions
PoA	Pewamo-Urban land complex, 0 to 2 percent slopes	Pewamo	50	depressions
PoA	Pewamo-Urban land complex, 0 to 2 percent slopes	Typic Endoaquents, till substratum	9	
RaA	Randolph loam, 0 to 2 percent slopes	Millsdale	2	depressions

Table 3.
Seneca County Hydric Soil List
Seneca County, OH

RbA	Randolph silt loam, 0 to 2 percent slopes		Millsdale	4	depressions
RnB	Rimer loamy fine sand, 1 to 4 percent slopes		Mermill	3	beach ridges
Rw	Rosburg silt loam, occasionally flooded		Very poorly drained soils	3	flood plains
Sb	Sebring silt loam		Sebring	90	depressions
Sb	Sebring silt loam		Pandora	10	depressions
Sg	Shoals silt loam, 0 to 2 percent slopes, occasionally flooded		Sloan	8	flood plains
Sh	Shoals silt loam, 0 to 2 percent slopes, frequently flooded		Sloan	8	flood plains
SkA	Sloan silt loam, 0 to 1 percent slopes, frequently flooded		Sloan	90	flood plains
SkA	Sloan silt loam, 0 to 1 percent slopes, frequently flooded		Silty clay loam surface layer	0	flood plains
SkA	Sloan silt loam, 0 to 1 percent slopes, frequently flooded		Thinner surface layer	0	flood plains
SkA	Sloan silt loam, 0 to 1 percent slopes, frequently flooded		Loam surface layer	0	flood plains
SkA	Sloan silt loam, 0 to 1 percent slopes, frequently flooded		Bedrock at 48 to 60 inches	0	flood plains
SoB	Spinks fine sand, 2 to 6 percent slopes		Granby	3	beach ridges
TrA	Tiro silt loam, 0 to 2 percent slopes		Pandora	4	depressions
TrA	Tiro silt loam, 0 to 2 percent slopes		Lenawee	3	depressions
TrB	Tiro silt loam, 2 to 6 percent slopes		Pandora	8	depressions
Ua	Udorthents, loamy		poorly drained soils in excavated areas	10	depressions

APPENDIX A: RESUMES

EXPERIENCE SUMMARY

Mr. Korey McCluskey a wetland/environmental scientist with 10+ years of experience in wetland delineation, stream evaluation, State and Federal rare, threatened & endangered (SOSC) botanical surveying and assessment, and construction monitoring throughout Pennsylvania, Ohio, West Virginia, New Jersey and New York. Korey has performed hundreds of wetland delineations and stream evaluations as well as conducted numerous botanical surveys, habitat assessments, and related report generation. Korey is on the USFWS short list of qualified surveyors for the federally listed Running Buffalo Clover, Small Whorled Pogonia, and Virginia Spirea in West Virginia. He has provided environmental consultation to clients in the commercial Oil and Gas, residential development, and public utility sectors to ensure compliance with local, state, and federal environmental regulations and ordinances through the environmental permitting process, including minimization of impacts to aquatic and terrestrial resources. This permitting, documentation, and guidance includes the preparation of wetland delineation and stream evaluation reports, botanical reports, wetland creation, wetland monitoring, 401, 404, 105 and related state and local permits, assisting with environmental assessments, and preparation of other environmental reports. He also has experience performing Phase 1 bat hibernaculum and summer roost tree habitat surveys in Western Pennsylvania, Ohio, and West Virginia.

RELEVANT EXPERIENCE

PERMITTING (OIL/GAS)

Wetland/Environmental Scientist IV - Department Technical Lead; Stonehenge Appalachia, L.L.C.; Renick to Shields Natural Gas Pipeline Project, Butler County, Pennsylvania; January 2016 to present. Responsibilities included co-preparing the Joint Permit application and all associated agency documentation to permit anticipated impacts along a 7.9 mile proposed pipeline.

Wetland/Environmental Scientist IV - Department Technical Lead; Equitrans, L.P. (Equitrans); Equitrans Expansion Project (EEP), Allegheny, Washington, and Greene Counties, Pennsylvania; March 2016 to present. Responsibilities included assisting in preparing permit documents for the 401 Water Quality Certification. Additional work included preparation of many of the required components of a Joint Permit.

Wetland/Environmental Scientist IV - Department Technical Lead; Sunoco Logistics; S P L P Houston Tank Farm Project, Washington County, Pennsylvania; May 2015 to present. Responsibilities included performing a supplemental wetland delineation, functions and values assessment, wetland report, and Joint Permit preparation for the proposed wetland impacts at the 21 acre proposed tank farm Project.

EDUCATION

B.A., Environmental Sciences, University of Pittsburgh, April. 2006
Geographical Information Systems (GIS) Certificate, University of Pittsburgh, April. 2006

REGISTRATIONS

Wild Plant Management Permit, PA, since 2013, Permit # 17-624
USFWS Certified Qualified Surveyor for the Federally Listed Running Buffalo Clover, Small Whorled Pogonia, and Virginia Spirea in West Virginia. Since May 2015

AREA OF EXPERTISE

Wetland Delineation and Stream Identification, State and Federal RTE Botanical Surveys, & Aquatic Resource Permitting.

TRAINING/CERTIFICATIONS

USFWS and WV DNR Sponsored Training for the Identification of the Federally Listed Running Buffalo Clover, Virginia Spirea, and Small Whorled Pogonia, May 2015.
2015 PA Plant Forum and Winter Woody ID workshop. Sponsored by the PA DCNR and Western Pennsylvania Conservancy, April 2015.
Creation and Restoration of Wetlands - The Olentangy River Wetland Research Park, The Ohio State University, July 2011.
Identification of Freshwater Wetland Sedges, Grasses, and Rushes - Pennsylvania Institute for Conservation Education, August 2010.
Ohio Rapid Assessment Method (ORAM) for Wetlands v. 5.0- Ohio Environmental Protection Agency, March. 2009.
ACOE-based 40-hour Wetland Delineation Certification - March. 2007.

OFFICE

Pittsburgh, PA

YEARS OF EXPERIENCE

10+

YEARS WITHIN FIRM

5+

CONTACT

Korey.McCluskey@TetraTech.com

Wetland/Environmental Scientist IV; MVP; Mountain Valley Pipeline Project, Multiple Counties, West Virginia and Virginia; 2016 to present. Responsibilities included assisting with review and compilation of multiple county wetland delineation reports and aiding in Nationwide Permit and 401 Water Quality Certification packages.

Wetland/Environmental Scientist IV; Department Technical Lead; Various Oil & Gas Projects, PNDI Sensitive Species Reviews and Agency Coordination, [primarily] Pennsylvania, Ohio, and West Virginia; 2016 to present. Responsibilities included running PNDI searches and providing results for sensitive species hits for multiple Oil & Gas related projects. Agency coordination and requested report generation or submittal; including large and small project PNDI package submittals.

BOTANICAL FIELD WORK (OIL/GAS)

Wetland/Environmental Scientist IV - Department Technical Lead; Kinder Morgan, Inc.; TGP 300 Line Project Plant Species of Special Concern (SOSC) Monitoring Report, Rare, Threatened, and Engendered Species Surveys; 6 listed Species of Special Concern (SOSC); June 2017. SOSC botanical monitoring surveys were performed for six species along TGP Loop 317, TGP Loop 321, and TGP Loop 323 in Bradford County, Susquehanna County, and Pike County, respectively. A Plant Species of Special Concern Monitoring Report was prepared for Kinder Morgan for submission to PA state regulatory agencies.

Wetland/Environmental Scientist IV - Department Technical Lead; Kinder Morgan, Inc.; TGP 300 Line Project Trailside Assessment Surveys and Botanical reconnaissance in the Bearfort Mountain Natural Area (BMNA) and the Abraham S. Hewitt State Forest (AHSF); June 2016. New Jersey. Trailside Assessments of the trails throughout the BMNA and AHSF. Assessed trail conditions, took photographs, and recorded botanical species in specified botanical niches throughout the two natural areas. A New Jersey state listed species of special concern Water Sedge (*Carex aquatilis*) that had not be previously identified in the area was recorded and reported.

Wetland/Environmental Scientist IV - Department Technical Lead; Sunoco Logistics; OPP and PPP Natural Gas Pipeline Projects, Rare, Threatened, and Engendered Species Surveys; 43 listed Species of Special Concern (SOSC); March 2014 to present. Pennsylvania. Segments 1, 2, and 3 Botanical Survey Lead, and crew leader. Responsibilities included organizing and conducting all field work operations for multiple botanical crews, conducted botanical surveys for 43+ PA State listed species for the 350 miles of proposed pipeline installation for the Ohio Pipeline (OPP) and Pennsylvania Pipeline Projects (PPP). Additional work included proposing potential re-routes and avoidance recommendations on a potential environmental impact basis, and preparing Botanical Reports, Conservation Plans, and Monitoring for the Project. Also aided in conducting a RTE survey for the federally listed Running Buffalo Clover in the WV segment of OPP.

June 2017 to present. Pennsylvania. Segments 1, 2, and 3 Botanical Survey Lead, and crew leader. Responsibilities included pre-construction surveying, sensitive species location confirmation, and documentation. Construction and post-construction monitoring to occur for sensitive species with PADCNr commitments in the coming months.

Wetland/Environmental Scientist IV - Department Technical Lead; Noble Energy, Inc.; Dunkard Fork Water Withdrawal Project; Greene County, PA; June 2014 to September 2014. Responsible for conducting botanical surveys and habitat assessments for 5 listed SOSC. Responsible for preparing a botanical survey and habitat assessment report in support of permit submissions.

Wetland/Environmental Scientist IV - Department Technical Lead; Rice Poseidon Midstream, LLC; North Fork Dunkard Fork Water Withdrawal Project; Greene County, PA; December 2014 to January 2015. Responsible for conducting a botanical habitat assessment for 2 listed SOSC. Responsible for preparing a botanical habitat assessment report in support of permit submissions.

Wetland/Environmental Scientist III; Sunoco Logistics; Mariner East [ME1] Pipeline Project Natural Gas Pipeline Projects, Rare, Threatened, and Endangered Species Surveys; 8 listed Species of Special Concern (SOSC); April 2013 to August 2013. Botanical Survey Lead, and crew leader. Responsibilities included organizing and conducting all field work operations for multiple botanical crews, conducted botanical surveys for the 20 miles of the 40 mile proposed pipeline installation Mariner East [ME1] Pipeline Project. Additional work included proposing potential avoidance recommendations based on a potential environmental impact basis.

Wetland/Environmental Scientist IV - Department Technical Lead; Rice Drilling B, LLC; Fink Pond Impoundment Project; Greene County, PA; October 2014. Responsible for conducting a wetland delineation and stream investigation, as well as a botanical survey for 2 listed SOSC. Responsible for preparing a wetland delineation and stream identification report and a botanical survey report in support of permit submissions.

Wetland Scientist; MEPCO, LLC.; Coresco Overland Coal Conveyor Project; Greene (PA) and Monongalia (WV) Counties. Responsible for wetland delineation and review and stream evaluation of a 10 mile overland coal conveyor. Rare, threatened, and endangered species (SOSC) survey and permitting services were provided.

AQUATIC RESOURCES FIELD WORK (OIL/GAS)

Wetland/Environmental Scientist IV - Department Technical Lead; Sunoco Logistics; OPP and PPP Natural Gas Pipeline Projects, Multiple Counties across Ohio, West Virginia, and Pennsylvania; October 2013 to present. Responsibilities included aiding in wetland delineations, stream assessments, and report preparation for the proposed 450 miles of the Ohio Pipeline (OPP) and Pennsylvania Pipeline Projects (PPP).

Wetland/Environmental Scientist IV - Department Technical Lead; Dominion Transmission, Inc.; Lebanon West II - TL-400 FERC Pipeline Project; Tuscarawas, Licking, Muskingum, Harrison, Coshocton, Columbiana, and Carroll Counties, Ohio (OH) and in Beaver County, Pennsylvania (PA); June 2014 to present. Responsible for conducting wetland delineations and stream evaluations for the natural gas pipeline replacement segments of the TL-400 FERC Pipeline Project. Specific tasks included field surveys, report preparation, and completion of Ohio EPA specific wetland and stream assessments.

July 2017 to present. Ohio. Field Survey Lead. Responsibilities included post-construction wetland and stream restoration monitoring and report generation. Restoration monitoring surveys included documentation of restoration efforts at impacted aquatic resources, tabular and graphical representations of restoration progress, and technical reporting and recommendations to achieve post-construction permit closure conditions set forth by USACE and OEPA.

Wetland/Environmental Scientist IV - Department Technical Lead; MarkWest Liberty Midstream and Resources, LLC; Harmon Creek to Houston [Fox to Houston] Pipeline Project, Washington Co., PA. Responsible for conducting wetland delineation & stream surveys along 20-mile proposed natural gas pipeline and associated report generation.

Wetland/Environmental Scientist IV - Department Technical Lead; MarkWest Liberty Midstream and Resources, LLC; Fox to National Fuels Pipeline Project, Washington Co., PA. Responsible for conducting wetland delineation & stream surveys along 2-mile proposed natural gas pipeline and associated report generation.

Wetland/Environmental Scientist IV - Department Technical Lead; MarkWest Liberty Midstream and Resources, LLC; Fox to Midway-Candor Pipeline Project, Washington Co., PA. Responsible for conducting wetland delineation & stream surveys along 14-mile proposed natural gas pipeline and associated report generation.

Wetland/Environmental Scientist IV - Department Technical Lead; MarkWest Liberty Midstream and Resources, LLC; Imperial to Midway-Candor Pipeline Project, Washington Co., PA. Responsible for conducting wetland delineation & stream surveys along 1-mile proposed natural gas pipeline and associated report generation.

Wetland/Environmental Scientist IV - Department Technical Lead; MarkWest Liberty Midstream and Resources, LLC; Wetland Delineations for Miscellaneous Natural Gas Pipeline Projects; Washington, Beaver, Allegheny, and Butler Counties. Responsible for performing with wetland delineations for various proposed natural gas pipeline projects in southwestern Pennsylvania. Specific tasks included leading aquatic resource field surveys, report generation, and client and agency coordination.

Wetland/Environmental Scientist IV - Department Technical Lead; Chevron Appalachia, LLC; Various Water Withdrawal Projects; Greene, Fayette, Washington Counties (PA); 2014 to 2016. Responsible for conducting numerous wetland delineations and stream evaluations for proposed water withdrawal projects located in southwestern Pennsylvania. Also prepared wetland delineation and stream assessment reports for each project in support of permit submissions.

Wetland/Environmental Scientist IV - Department Technical Lead; Noble Energy, Inc.; Various Water Withdrawal Projects; Greene, Fayette, Washington Counties (PA), and Marshall County (WV); March 2014 to 2016. Responsible for conducting numerous wetland delineations and stream evaluations for proposed water withdrawal projects located in southwestern Pennsylvania and the panhandle of West Virginia. Also prepared wetland delineation and stream assessment reports for each project in support of permit submissions.

Wetland/Environmental Scientist IV - Department Technical Lead; Noble Energy, Inc.; Wolfe Run Reservoir Water Withdrawal, Water Pipeline, and Access Road Project; Marshall County, WV; May 2014 to September 2014. Responsible for conducting a wetland delineation and stream evaluation for a proposed water withdrawal, water pipeline, and its associated access road. Also prepared a wetland delineation and stream assessment report in support of permit submissions.

Wetland/Environmental Scientist IV - Department Technical Lead; Rice Drilling D, LLC; Various Water Withdrawal Projects; Harrison and Belmont Counties (OH); March 2014 to present. Responsible for conducting numerous wetland delineations and stream evaluations for proposed water withdrawal projects located in eastern Ohio. Also prepared wetland delineation and stream assessment reports for each project in support of permit submissions.

Wetland/Environmental Scientist IV - Department Technical Lead; Rice Poseidon Midstream, LLC; Waterboy to Pollock Natural Gas Pipeline Project; Washington County, PA; July 2014 to January 2015. Responsible for conducting a wetland delineation and stream identification survey. Responsible for preparing a wetland delineation and stream identification report in support of permit submissions.

Wetland/Environmental Scientist IV; MarkWest Liberty Midstream and Resources, LLC; Boy Scout Camp Wetland Restoration Project & Post-Restoration Monitoring; Harrison County, PA; November 2012 to present. Responsible for evaluating post-impact conditions at a recently disturbed wetland, assist in designing a USACE approved wetland restoration plan. Plans included survey of current and proposed wetland habitats, elevations, and hydrologic inputs; planting/seeding plan and implementation instructions; and construction/earthwork calculations and implementation instructions. Also responsible for wetland restoration monitoring for the past two years.

Wetland/Environmental Scientist III; MarkWest Ohio Gathering Company, LLC; Wetland Delineations for Miscellaneous Natural Gas Pipeline Projects; Ohio. Responsible for performing and assisting with wetland delineations for various proposed natural gas pipeline projects in eastern Ohio. Specific tasks included field survey, report preparation, and completion of Ohio EPA specific wetland and stream assessments.

Wetland/Environmental Scientist III; Gulfport Energy Corporation; Wetland Delineations for Miscellaneous Natural Gas Well Pad Projects; Ohio. Responsible for performing and assisting with wetland delineations for various proposed natural well pads southeastern Ohio. Specific tasks included field survey, report preparation, and completion of Ohio EPA specific wetland and stream assessments.

Wetland/Environmental Scientist III; Williams/Laurel Mountain Midstream Operations, LLC; Brown to Davis Natural Gas Pipeline Project; Fayette County, PA; January 2013 to present. Conducted a wetland delineation and stream evaluation for the Brown to Davis natural gas pipeline project. Also prepared a wetland delineation and stream evaluation report in support of permit submissions.

Wetland Scientist; Joseph and Lori Baker; Baker Property Wetland Restoration Project; Derry Township, Westmoreland County, PA; March 2010 to June 2010. As onsite environmental consultant to Joseph and Lori Baker, responsible for wetland and stream encroachment survey and assessment and assisted with a wetland restoration design and planting/seeding design.

Wetland Scientist/Project Manager; Range Resources; Multiple Temporary and Permanent Water Pipelines; Washington County, Pennsylvania. 2010 to 2011. Mr. McCluskey was responsible for wetland delineations and stream evaluations on dozens of temporary and permanent water pipelines linking frac water impoundments in the Washington County area.

AQUATIC RESOURCES FIELD WORK (ENERGY TRANSMISSION)

Wetland Scientist; Orange & Rockland Utilities, Inc., Counties of Bergen (NJ) and Rockland (NY); Transmission Line 702 – Proposed Shield Wire Replacement Project; November 2008 to February 2009. Responsible for wetland delineation and stream evaluation of a 500 foot wide, 10 mile long transmission line corridor.

AQUATIC RESOURCES FIELD WORK (MINING)

Wetland Scientist; Rosebud Mining Company; Kiski Junction Railroad Allegheny River Spur Re-activation Project; Bethel and Gilpin Townships, Armstrong County, PA; 2007 to 2008. As onsite environmental consultant to Rosebud Mining Company, responsible for wetland delineation and assisted with the preparation of a Joint Permit Application for USACE Individual Permit, as well as assisting with wetland mitigation site search and wetland mitigation design for railroad re-activation project.

Wetland Scientist; MEPCO, LLC.; Coresco Overland Coal Conveyor Project; Greene (PA) and Monongalia (WV) Counties. Responsible for wetland delineation and review and stream evaluation of a 10 mile overland coal conveyor. Rare, threatened, and endangered species (SOSC) survey and permitting services were provided.

CHRONOLOGICAL HISTORY

Wetland/Environmental Scientist IV - Department Technical Lead; Tetra Tech, Inc.; Pittsburgh, PA, June 2014 – Present.

Wetland/Environmental Scientist III; Tetra Tech, Inc.; Pittsburgh, PA, October 2012 – June 2014.

Wetland Specialist/Project Manager; Pennsylvania Soil & Rock, Inc.; Monroeville, PA, May 2010 – October 2012.

Wetland/Environmental Specialist; Pennsylvania Soil & Rock, Inc.; Monroeville, PA, March 2008 – May 2010.

Wetlands Technician/Field Technician; Pennsylvania Soil & Rock, Inc.; Monroeville, PA, November 2006 – March 2008.

Park Naturalist; Frick Environmental Center – City of Pittsburgh; Pittsburgh, PA, April 2006 – November 2006.

MEMBERSHIPS

- Society of Wetland Scientists (SWS)
- Botanical Society of Western Pennsylvania (BSWP)

EXPERIENCE SUMMARY

Mr. Vleno has worked in the environmental field for over ten years. He has extensive experience conducting wetland delineations. His experience also includes habitat assessments, endangered species surveys, and permit preparation. He has additional experience performing and supervising Phase 1 archaeological surveys. Mr. Vleno's educational background includes graduate level studies in wetland ecology, stream ecology, hydrology, wetland/stream restoration methods, geology, and environmental impact assessments.

RELEVANT EXPERIENCE

Environmental Scientist IV; Transcontinental Gas Pipe Line Company, LLC; Permitting and Wetland Delineations for Miscellaneous Natural Gas Pipeline Projects. Conducts wetland delineations for various proposed natural gas pipeline projects. Responsible for state and federal agency threatened and endangered species coordination.

Environmental Scientist IV; NextEra Energy Resources, LLC; Permitting and Wetland Delineation for Muskingum OH Solar Project; Ohio, June 2017. Conducted wetland delineation and prepared report for proposed 1400-acre solar farm.

Environmental Scientist IV; EQT; Permitting and Wetland Delineation for Mountain Valley Pipeline Project; West Virginia, April 2015 to December 2017. Collaborated with team in preparing Nationwide and State 401 permit packages. Conducted wetland delineation field surveys, stream assessments and, and macroinvertebrate surveys.

Environmental Scientist IV; Kinder Morgan; Trailside Rapid Assessment for 300 Line Project; New Jersey, July 2016. Led field team in conducting trailside rapid assessments. Specific tasks included identifying all dominant vegetation at pre-determined plots throughout the Bearfort Mountain Natural Area.

Environmental Scientist IV; Sunoco Logistics; Wetland Delineation and Engendered Species Survey for Pennsylvania Pipeline Project; Pennsylvania, January 2014 to December 2016. Conducted wetland delineations and endangered species survey along pipeline right-of-way. Specific tasks included field survey and report preparation.

Environmental Scientist IV; MarkWest Liberty Midstream & Resources, LLC; Wetland Delineations for Miscellaneous Natural Gas Pipeline Projects; Pennsylvania. Conducts wetland delineations for various proposed natural gas pipeline projects in southwestern Pennsylvania. Specific tasks included field survey, report preparation, and wetland functional assessments.

Environmental Scientist IV; Dominion Transmission Inc.; Wetland Delineations for Miscellaneous Natural Gas Pipeline Projects; West Virginia. Conducts wetland delineations for various existing and proposed natural gas pipeline and facility projects in West Virginia. Specific tasks included field survey and report preparation.

Environmental Scientist III; Sunoco Logistics; Wetland Delineation and Engendered Species Survey for Ohio Pipeline Project; Ohio, West Virginia, Pennsylvania, January 2014 to December 2014. Conducted wetland delineations and endangered species survey along pipeline right-of-way. Specific tasks included field survey, report preparation, and permitting activities.

EDUCATION

B.A., Anthropology, 2007, State University College at Buffalo

AREA OF EXPERTISE

Wetland Science

TRAINING/CERTIFICATIONS

38 Hour ACOE Wetland Delineation Training Program, November 2009

Advanced Hydric Soils, May 2016

Running Buffalo Clover, Virginia Spirea, and Small Whorled Pogonia Federal RTE Identification Workshop, May 2015

Winter Woody Plant Identification, April 2015

Identifying Grasses, Sedges, and Rushes, June 2014

Ohio Rapid Assessment Method for Wetlands Training Course, May 2013

American Red Cross Adult CPR/AED, February 2018

16 Hour Wilderness First Aid, February 2018

40 hours EPA 165.5 HAZWOPER Health and Safety Worker 2012

OFFICE

Pittsburgh, PA

YEARS OF EXPERIENCE

10+

YEARS WITHIN FIRM

10+

CONTACT

Codie.Vleno@TetraTech.com

Environmental Scientist III; Environmental and Restoration Services Contract for Site 73, Site 178, and Site 20. Army Corps of Engineers Louisville District. Savanna, Illinois; November 2014. Conducted wetland delineation and threatened and endangered species review in support of remedial activities. Responsible for field effort and report deliverables.

Environmental Scientist III; Rice Energy; Wetland Delineations for Miscellaneous Natural Gas Pipeline Projects; Pennsylvania and Ohio. Conducts wetland delineations and permitting activities for various proposed natural gas pipeline projects in eastern Ohio. Specific tasks include field survey, report preparation, completion of Ohio EPA specific wetland/stream assessments, agency consultation, and compiling of PCN.

Environmental Scientist III; MarkWest Ohio Gathering Company, LLC; Wetland Delineations for Miscellaneous Natural Gas Pipeline Projects; Ohio. Conducts wetland delineations for various proposed natural gas pipeline projects in eastern Ohio. Specific tasks included field survey, report preparation, and completion of Ohio EPA specific wetland and stream assessments.

Environmental Scientist III; Gulfport Energy Corporation; Wetland Delineations for Miscellaneous Natural Gas Well Pad Projects; Ohio. Responsible for performing and assisting with wetland delineations for various proposed natural well pads southeastern Ohio. Specific tasks included field survey, report preparation, PCN preparation, and completion of Ohio EPA specific wetland and stream assessments.

Environmental Scientist III; MarkWest Liberty Midstream & Resources, LLC; Wetland Delineation and Engendered Species Survey (*Ranunculus flabellaris* and *Alopecurus aequalis*) for Vanport to Butler Gas Pipeline; Butler County, Pennsylvania. Responsible for performing and assisting with wetland delineation and endangered species survey along pipeline right-of-way. Specific tasks included field survey and report preparation.

Environmental Scientist III; Antero Resources Appalachian Corp.; Wetland Delineations for Miscellaneous Natural Gas Pipeline Projects; Ritchie and Doddridge Counties, West Virginia. Responsible for performing and assisting with wetland delineations for various proposed natural gas well pads and access roads in northern West Virginia. Specific tasks included field survey and report preparation.

Environmental Scientist III; Stone Energy; Wetland Delineation for Mercer 1 Well Pad; Sisterville, Tyler County, West Virginia; September 2012. Performed wetland delineation for proposed natural gas well pad and associated access road. Specific tasks included field survey and report preparation.

Environmental Scientist III; Laurel Mountain Midstream Operating, LLC; Endangered Species Survey (Yellow Passionflower) for Miller to Headlee Pipeline Project; Greene and Cumberland Townships, Greene County, Pennsylvania; September 2012. Assisted with botanical survey for yellow passionflower along the proposed Miller to Headlee natural gas pipeline right-of-way and access roads. Tasks included pre-survey research, field survey, and report preparation.

Environmental Scientist III; Laurel Mountain Midstream Operating, LLC; Endangered Species Survey (Drooping Bluegrass) for Nickelville Pipeline Project; Nickelville, Venango County, Pennsylvania; July 2012. Assisted with botanical survey for drooping bluegrass along the proposed Nickelville natural gas pipeline right-of-way. Specific tasks included field survey and report preparation.

Environmental Scientist III; Laurel Mountain Midstream Operating, LLC; Endangered Species Survey (Tall Larkspur) for Dunlap Creek Pipeline Project; Luzerne and Redstone Townships, Fayette County, Pennsylvania; June 2012. Assisted with botanical survey for tall larkspur along the proposed Dunlap Creek natural gas pipeline right-of-way and access roads. Specific tasks included field survey and report preparation.

Environmental Scientist III; Laurel Mountain Midstream Operating, LLC; Wetland Delineations for Miscellaneous Natural Gas Pipeline Projects; Pennsylvania. Responsible for performing and assisting with wetland delineations for various proposed natural gas pipeline projects in southwestern Pennsylvania. Specific tasks included field survey and report preparation.

Environmental Scientist III; Enervest Operating, LLC; Wetland Delineations for Miscellaneous Natural Gas Pipeline Projects; Ohio. Responsible for performing and assisting with wetland delineations for various proposed natural gas pipeline projects in southeastern Ohio. Specific tasks included field survey, report preparation, and completion of Ohio EPA specific wetland and stream assessments.

Environmental Scientist III; NAVFAC Washington; Marine Corps Base Quantico Wetland Functional Analysis; Quantico, Virginia; April 2012. Assisted with wetland functional assessments in support of remedial activities.

Environmental Scientist III; NASA; Wallops Flight Facility Remedial Action Contract; Wallops Island, Virginia; March 2012. Assisted with wetland delineation and wetland functional assessments in support of remedial activities.

Environmental Scientist III; Burnett Oil Company, Inc.; New Salem, Pennsylvania; December 2011 to February 2012. Responsible for performing and assisting with wetland delineations for various proposed natural gas pipeline projects in southwestern Pennsylvania. Specific tasks included field survey and report preparation.

Scientist I; Army Corps of Engineers; South Park Lake Dredge Project; Buffalo, New York; October 2011. Supervised Phase 1 archaeological survey in preparation of dredging activities.

Scientist I; Dominion East Ohio; Monroe County Gas Pipeline Project; Indiana Bat Habitat Assessment and Wetland Delineation; Woodsfield, Ohio; July 2011 to September 2011. Assisted with Indiana Bat habitat assessment and wetland delineation along a proposed natural gas pipeline right-of-way. Specific tasks included field survey and completion of Ohio EPA specific wetland and stream assessments. Other responsibilities included Phase 1A archaeological assessment

Archaeological Technician; National Grid; Lockport to Mortimer; Rochester, New York; May 2011 to October 2011. Performed Phase 1 archaeological survey in support of transmission line replacement. Assisted with report preparation.

Scientist I; National Fuel Gas Company; Tioga Pipeline Expansion; Tioga County, Pennsylvania; June 2011 to September 2011. Assisted with wetland delineation along proposed natural gas pipeline right-of-way. Other responsibilities included performing a Phase 1A archaeological assessment and supervising a Phase 1 archaeological survey.

Archaeological Technician; National Fuel Gas Company; Allegheny National Forest Pipeline Project; Warren, Pennsylvania; September 2009 to October 2009. Performed Phase 1 archaeological survey along proposed natural gas pipeline right-of-way.

Archaeological Technician; Dominion East Ohio; Pipeline Replacement; Wooster, Ohio; June 2008 to July 2009. Performed Phase 1 archaeological survey along proposed natural gas pipeline right-of-way.

Archaeological Technician; Haley & Aldrich, Inc.; AES Sparrows Point LNG; Cecil County, Maryland; June 2008 to July 2008. Performed Phase 1 archaeological survey along proposed natural gas pipeline right-of-way.

Archaeological Technician; Horizon Wind Energy, LLC; Arkwright Wind Farm; Arkwright, New York; September 2008 to March 2009. Performed Phase 1 archaeological survey on proposed turbine pads and transmission lines.

Archaeological Technician; National Fuel Gas Supply Company.; Galbraith Storage Field Expansion Project; Allegheny National Forest, Marienville, Pennsylvania; August 2008 to October 2008. Performed Phase 1 archaeological survey along proposed natural gas pipeline right-of-way.

CHRONOLOGICAL HISTORY

Environmental Scientist IV; Tetra Tech, Inc.; Pittsburgh, Pennsylvania; 2011 – Present

Scientist I; Tetra Tech, Inc.; Buffalo, New York; June 2008 – November 2011

Research Assistant; State University of New York Research Foundation; Buffalo, New York; October 2009 – January 2010

On-Call Research Assistant; State University of New York Research Foundation; Buffalo, New York; May 2009 – August 2009

Report Writer; Test America Laboratories; Amherst, New York; November 2007 – June 2008

SCIENTIFIC/TECHNICAL PUBLICATIONS

N/A

MEMBERSHIPS

- Society of Wetland Scientists

Appendix M: Species Consultation

- M-1: ODNR Survey Effort Letter 4/25/18
- M-2: ODNR Survey Effort Letter 8/17/17
- M-3: ODNR Review Letter 11/21/12
- M-4: USFWS Review Letter 10/24/12
- M-5: ODNR Survey Effort Letter 2/25/09
- M-6: USFWS Project Review Letter 7/3/08

Appendix M-1: ODNR Survey Effort Letter 4/25/18



Ohio Department of Natural Resources

JOHN R. KASICH, GOVERNOR

JAMES ZEHRINGER, DIRECTOR

Ohio Division of Wildlife

Michael R. Miller, Chief
2045 Morse Rd., Bldg. G
Columbus, OH 43229-6693
Phone: (614) 265-6300

April 25, 2018

To all interested parties:

Based upon the revised project boundary map received April 2018, the Ohio Department of Natural Resources Division of Wildlife (DOW) has prepared initial survey recommendations for the proposed Seneca project located in Seneca, Huron, and Crawford counties regarding wildlife species.

Currently the project falls within regions of the state that DOW has identified as needing extensive monitoring efforts based on GIS analysis of the site. However, previous DOW recommendations have determined the habitat is not what DOW considers high-quality stopover habitat for migrating passerines and waterfowl. Therefore, the proposed facility was classified as a "moderate" site under the current protocols. If the developer decides to amend the current boundaries, the DOW will revise our survey recommendations.

State-listed plant species occur in Seneca, Huron, and Crawford counties and the list can be found here: <http://wildlife.ohiodnr.gov/species-and-habitats/state-listed-species/state-listed-species-by-county#plants>. Additional surveys may be warranted to determine presence of state-listed species if construction will impact aquatic or wetland habitat. Once the turbine, road, pad and other infrastructure locations have been determined, please consult with DOW to determine if such surveys are needed.

The attached table summarizes the types and level of survey effort recommended by the DOW. Results from these studies will help assess the potential impact the turbines may pose and will influence our recommendations to the Ohio Power Siting Board.

Monitoring should follow those methods described within the "On-shore Bird and Bat Pre- and Post-Construction Monitoring Protocol for Commercial Wind Energy Facilities in Ohio."

If you have any questions, please feel free to contact me at erin.hazelton@dnr.state.oh.us or 614.265.6349.

A handwritten signature in blue ink that reads "ER Hazelton". The signature is stylized with a large "E" and "R" and a cursive "Hazelton".

Erin Hazelton
Ohio Division of Wildlife
2045 Morse Road
Columbus, Ohio 43229

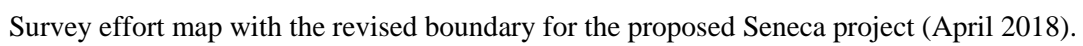
cc: Mr. Stuart Siegfried, Ohio Power Siting Board
Mr. Grant Zeto, Ohio Power Siting Board
Mr. Ashton Holderbaum, Ohio Power Siting Board
Ms. Megan Seymour, United States Fish and Wildlife Service
Ms. Kate Haley Parsons, DOW

Seneca Wind Project (April 2018)

Survey type

Breeding bird	Breeding bird surveys should be conducted at all sites. The number of survey points may be based on the amount of available habitat, or twice the maximum number of turbines proposed for the site. If turbines are placed in agricultural land, this requirement may be waived by DOW after reviewing the proposed turbine locations.
Raptor nest searches	Nest searches should occur on and within a 1-mile buffer of the proposed facility.
Raptor nest monitoring	Please consult with USFWS on bald eagle nests located within the search area. Nests should be monitored to assess daily bird activity. Should any additional nests of a protected species of raptor be located during nest searches, monitoring should commence as outlined within DOW's monitoring protocols.
Bat acoustic monitoring	To be conducted at all meteorological towers.
Passerine migration survey points	26
Diurnal bird/raptor migration survey points	1
Sandhill crane migration (same points as raptor migration)	NS
Owl playback survey points	NS
Barn owl survey points	NS
Bat mist-netting survey points	51
Nocturnal marsh bird survey points	Survey points on Silver Creek WA, Honey Creek, and Sandusky River, as per protocols
Waterfowl survey points	Survey points for Silver Creek WA, Honey Creek, and Sandusky River, as per protocols
Shorebird migration survey points	NS
Radar monitoring locations	NS
Aquatic species surveys	This requirement may be waived by DOW after reviewing the proposed turbine/infrastructure locations.
Wetland species surveys	This requirement may be waived by DOW after reviewing the proposed turbine/infrastructure locations.

NS = Not required based on the lack of suitable habitat



Appendix M-2: ODNR Survey Effort Letter 8/17/17



Ohio Department of Natural Resources

JOHN R. KASICH, GOVERNOR

JAMES ZEHRINGER, DIRECTOR

Ohio Division of Wildlife

Michael R. Miller, Chief
2045 Morse Rd., Bldg. G
Columbus, OH 43229-6693
Phone: (614) 265-6300

August 17, 2017

To all interested parties:

Based upon the revised project boundary map received July 2017, the Ohio Department of Natural Resources Division of Wildlife (DOW) has prepared initial survey recommendations for the proposed Seneca project located in Seneca County regarding wildlife species.

Currently the project falls within regions of the state that DOW has identified as needing extensive monitoring efforts based on GIS analysis of the site. However, previous DOW recommendations have determined the habitat is not what DOW considers high-quality stopover habitat for migrating passerines and waterfowl. Therefore, the proposed facility was classified as a "moderate" site under the current protocols. If the developer decides to amend the current boundaries, the DOW will revise our survey recommendations.

State-listed plant and animal species occur in Seneca County and the list can be found here: <http://wildlife.ohiodnr.gov/species-and-habitats/state-listed-species/state-listed-species-by-county#plants>. Additional surveys may be warranted to determine presence of state-listed species if construction will impact suitable habitat. Once the turbine locations have been determined, please consult with DOW to determine if such surveys are needed.

The attached table summarizes the types and level of survey effort recommended by the DOW. Results from these studies will help assess the potential impact the turbines may pose and will influence our recommendations to the Ohio Power Siting Board.

Monitoring should follow those methods described within the "On-shore Bird and Bat Pre- and Post-Construction Monitoring Protocol for Commercial Wind Energy Facilities in Ohio."

If you have any questions, please feel free to contact me at erin.hazelton@dnr.state.oh.us or 614.265.6349.

A handwritten signature in blue ink that reads "ER Hazelton". The signature is stylized with a large "E" and "R" and a long, sweeping underline.

Erin Hazelton
Ohio Division of Wildlife
2045 Morse Road
Columbus, Ohio 43229

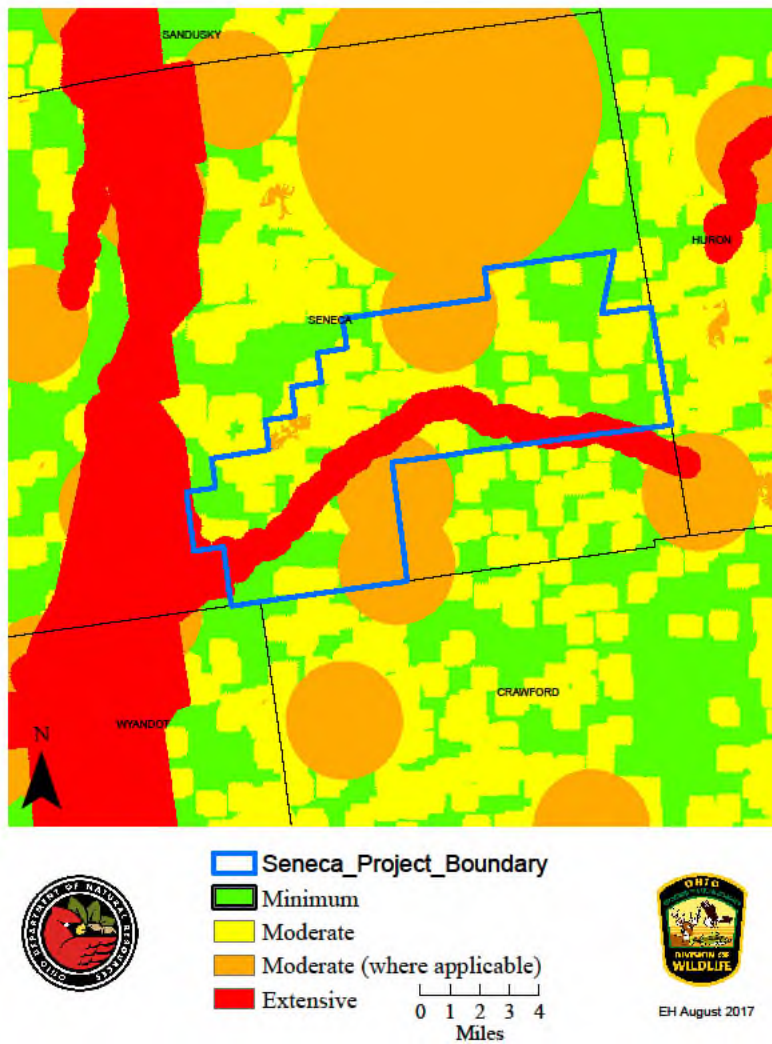
cc: Mr. Stuart Siegfried, Ohio Power Siting Board
Mr. Grant Zeto, Ohio Power Siting Board
Mr. Ashton Holderbaum, Ohio Power Siting Board
Ms. Megan Seymour, United States Fish and Wildlife Service
Ms. Kate Haley Parsons, DOW

Seneca Wind Project (August 2017)

Survey type

Breeding bird	Breeding bird surveys should be conducted at all sites. The number of survey points may be based on the amount of available habitat, or twice the maximum number of turbines proposed for the site. If turbines are placed in agricultural land, this requirement may be waived by DOW after reviewing the proposed turbine locations.
Raptor nest searches	Nest searches should occur on and within a 1-mile buffer of the proposed facility.
Raptor nest monitoring	Please consult with USFWS on bald eagle nests located within the search area. Nests should be monitored to assess daily bird activity. Should any additional nests of a protected species of raptor be located during nest searches, monitoring should commence as outlined within DOW's monitoring protocols.
Bat acoustic monitoring	To be conducted at all meteorological towers.
Passerine migration survey points	26
Diurnal bird/raptor migration survey points	1
Sandhill crane migration (same points as raptor migration)	NS
Owl playback survey points	NS
Barn owl survey points	NS
Bat mist-netting survey points	52
Nocturnal marsh bird survey points	Survey points on Silver Creek WA, Honey Creek, and Sandusky River, as per protocols
Waterfowl survey points	Survey points for Silver Creek WA, Honey Creek, and Sandusky River, as per protocols
Shorebird migration survey points	NS
Radar monitoring locations	NS
Aquatic species surveys	This requirement may be waived by DOW after reviewing the proposed turbine locations.
Wetland species surveys	This requirement may be waived by DOW after reviewing the proposed turbine locations.

NS = Not required based on the lack of suitable habitat



Survey effort map with the revised boundary for the proposed Seneca project (August 2017).

Appendix M-3: ODNR Review Letter 11/21/12



Ohio Department of Natural Resources

JOHN R. KASICH, GOVERNOR

JAMES ZEHRINGER, DIRECTOR

Ohio Division of Wildlife

Scott Zody, Chief
2045 Morse Rd., Bldg. G
Columbus, OH 43229-6693
Phone: (614) 265-6300

November 21, 2012

Dear Ms. Abernethy:

This letter is in response to your request for an updated review using the Ohio Division of Wildlife's Biodiversity Database (OBD), for the proposed Exelon Generation wind facility in Seneca County. The proposed project is for approximately 58 turbines (150 MW). The Division of Wildlife supports the development of wind power as an alternative energy source; however wind turbines can have a negative impact on wildlife if not sited, designed, and operated to minimize and avoid this impact.

The project is within 5 miles of several Indiana bat (*Myotis sodalis*) maternity roosts. Indiana bats are state and federally endangered species, therefore coordination should continue with ODNR Wind Energy Biologist on how best to proceed with the project and minimize to the maximum extent possible any take of this endangered species.

The project is within the range of the bald eagle (*Haliaeetus leucocephalus*), a state threatened species. The Ohio Biodiversity Database has 16 records for Bald Eagle nests within the project area and a ten mile radius. There are 3 nests directly within the project area.

The project is within the range of the rayed bean (*Villosa fabalis*), a state endangered and federal endangered mussel species. If there is a potential habitat for mussels near the proposed project area, it may be necessary mussel survey in the project area. Surveys must be conducted within six months before any in-water disturbance occurs, by a malacologist approved by the DOW. If no in-water work is proposed, the project is not likely to impact this species.

The project is within the range of the bobcat (*Lynx rufus*) and the black bear (*Ursus americanus*), state endangered species. Due to the mobility of these species, the project is not likely to have an impact on these species.

The project is within the range of the American bittern (*Botaurus lentiginosus*), a state endangered bird. A statewide survey has not been completed for this species. A lack of records does not indicate the species is absent from the area. Nesting bitterns prefer large undisturbed wetlands that have scattered small pools amongst dense vegetation. They occasionally occupy bogs, large wet meadows, and dense shrubby swamps. If this type of habitat will be impacted, construction must be avoided in this habitat during the species'



Ohio Department of Natural Resources

JOHN R. KASICH, GOVERNOR

JAMES ZEHRINGER, DIRECTOR

nesting period of May 1 to July 31. Additionally, minimization efforts should occur during the operation of the facility to avoid take of the species.

The project is within the range of the king rail (*Rallus elegans*), a state endangered bird. A statewide survey has not been completed for this species. A lack of records does not indicate the species is absent from the area. Nests for this species are deep bowls constructed out of grass and usually hidden very well in marsh vegetation. Therefore, if this type of habitat will be impacted, construction must be avoided in this habitat during the species' nesting period of May 1 to August 1. Additionally, minimization efforts should occur during the operation of the facility to avoid take of the species.

The project is within the range of the Northern harrier (*Circus cyaneus*), a state endangered bird. A statewide survey has not been completed for this species. A lack of records does not indicate the species is absent from the area. This is a common migrant and winter species. Nesters are much rarer, although they occasionally breed in large marshes and grasslands. Harriers often nest in loose colonies. The female builds a nest out of sticks on the ground, often on top of a mound. Harriers hunt over grasslands. If this type of habitat will be impacted, construction must not occur in this habitat during the species' nesting period of May 15 to August 1.

The project is within the range of the sandhill crane (*Grus canadensis*), a state endangered species. A statewide survey has not been completed for this species. A lack of records does not indicate the species is absent from the area. Sandhill cranes are primarily a wetland-dependent species. On their wintering grounds, they will utilize agricultural fields. On breeding grounds they require a rather large tract of wet meadow, shallow marsh, or bog for nesting. Therefore, if grassland, prairie, or wetland habitat will be impacted, construction must not occur in this habitat during the species' nesting period of April 1 to September 1.

The project is within the range of the trumpeter swan (*Cygnus buccinator*), a state endangered bird. A statewide survey has not been completed for this species. A lack of records does not indicate the species is absent from the area. Trumpeter swans prefer large marshes and lakes ranging in size from 40 to 150 acres. They like shallow wetlands one to three feet deep with a diverse mix of plenty of emergent and submergent vegetation and open water. Therefore, if this type of wetland habitat will be impacted, construction must be avoided in this habitat during the species' nesting period of May 1 to August 1.

The project is within the range of the *Melanchra assimilis*, a state endangered moth, and the *Hypocoena enervata*, a state endangered moth. Due to the habitat used by these species and the type of work proposed, the project is not likely to impact these species.

The OBD shows there are eight managed areas in close proximity the project area, owned and/or managed by Heidelberg College (Wickwire-Shade Preserve), the Seneca Co. Park



Ohio Department of Natural Resources

JOHN R. KASICH, GOVERNOR

JAMES ZEHRINGER, DIRECTOR

District (Bowen Nature Preserve, Garlo Heritage Nature Preserve and Forrest Nature Preserve), the ODNR Division of Wildlife (Willard Marsh Wildlife Area and Silver Creek Marsh Wildlife Area), Natural Areas & Preserves (Howard Collier State Nature Preserve) and the Scenic Rivers Program (Sandusky Scenic River St. John's Dam). These areas should be considered as sensitive areas, thus avoided during final turbine selection.

Our inventory program has not completely surveyed Ohio and relies on information supplied by many individuals and organizations. Therefore, a lack of records for any particular area is not a statement that rare species or unique features are absent from that area.

The Division of Wildlife appreciates the opportunity to provide another review this project, and encourages Exelon to continue to coordinate this project with ODNR Wind Energy Biologist. Additionally, it is ODNR's recommendation that Exelon sign ODNR's *Cooperative Agreement*. If Exelon Renewables elects to not sign this agreement, the company will assume the liability of the potential risks that wind facility turbines may have on birds and bats during operation of the facility. Please contact me with any further questions you may have.

Sincerely,

A handwritten signature in blue ink that reads "Jennifer L. Norris".

Jennifer L. Norris
Wildlife Research Biologist
ODNR Wind Energy Biologist
ODNR, Division of Wildlife
2045 Morse Road, Building G
Columbus, OH 43229-6693
Tel: 614 265-6349
Email: jennifer.norris@dnr.state.oh.us

cc: Mr. Stuart Siegfried, Ohio Power Siting Board
Mr. Don Rostofer, Ohio Power Siting Board
Mr. Keith Lott, U.S. Fish and Wildlife Service

Appendix M-4: USFWS Review Letter 10/24/12



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
4625 Morse Road, Suite 104
Columbus, Ohio 43230
(614) 416-8993 / FAX (614) 416-8994

October 24, 2012

Yvonne F. Abernethy
6330 Woodside Executive Court
Aiken, SC
29803

TAILS : 31420-2010-TA-0442

Re: Seneca Project - Request for Update on Project Review

Dear Ms. Abernethy:

This letter is in response to your request for an updated review of the proposed Exelon Generation wind facility for Seneca County, Ohio. The proposed project is for approximately 58 wind turbines (150 MW) and associated infrastructure (collection lines, access roads, substation, etc.). The Service previously provided initial recommendations for the proposed project in a July 3, 2008 letter. We understand the proposed project consists predominately of active agricultural land (79%) and with scattered wooded and grassland habitats (17%). We encourage and appreciate your early coordination with ODNR and the Service, and recommend continued collaboration on this project to ensure wildlife issues are fully and appropriately addressed.

The following comments are being provided pursuant to the Endangered Species Act (ESA), Migratory Bird Treaty Act, Bald and Golden Eagle Protection Act, and Fish and Wildlife Act of 1956. This information is being provided to assist you in making an informed decision regarding wildlife issues, site selection, project design, and compliance with applicable laws. The Service has been working closely with ODNR Division of Wildlife to develop recommended survey protocols and site evaluations that will satisfy both State and Federal wildlife statutes, and this letter describes these measures, in part. The protocols, "On-Shore Bird and Bat Pre- and Post-Construction Monitoring Protocol for Commercial Wind Energy Facilities in Ohio" are available on ODNR's website at:

http://www.dnr.state.oh.us/Home/wild_resourcessubhomepage/ResearchandSurveys/WildlifeWind/tabid/21467/Default.aspx

The Service supports the development of wind power as an alternative energy source; however, wind farms can have negative impacts on wildlife and their habitats if not sited and designed with potential wildlife and habitat impacts in mind. Selection of the best sites for turbine placement is enhanced by avoiding sites with known, high concentrations of birds and/or bats passing within the rotor-swept area of the turbines or where the effects of habitat fragmentation will be detrimental. In support of wind power generation as a wildlife-friendly, renewable source of power, development sites with comparatively low bird, bat and other wildlife values, would be preferable and would have relatively lower impacts on wildlife.

WATER RESOURCE COMMENTS:

The Service recommends that impacts to streams and wetlands be avoided and buffers surrounding these systems be preserved. Streams and wetlands provide valuable habitat for fish and wildlife resources, and the filtering capacity of wetlands helps to improve water quality. Naturally vegetated buffers surrounding these systems are also important in preserving their wildlife-habitat and water quality-enhancement properties. Furthermore, forested riparian systems (wooded areas adjacent to streams) provide important stopover habitat for birds migrating through the region. The proposed activities do not constitute a water-dependent activity, as described in the Section 404(b)(1) guidelines, 40 CFR 230.10. Therefore, practicable alternatives that do not impact aquatic sites are presumed to be available, unless clearly demonstrated otherwise. Therefore, before applying for a Section 404 permit, the client should closely evaluate all project alternatives that do not affect streams or wetlands, and if possible, select an alternative that avoids impacts to aquatic resources. If water resources will be impacted, the Buffalo Corps of Engineers should be contacted about the need for a Section 404 permit.

ENDANGERED SPECIES COMMENTS:

Because of the potential for wind power projects to impact endangered bird, bat, or other listed species, they are subject to the Endangered Species Act (16 U.S.C. 1531-1544) section 9 provisions governing "take", similar to any other development project. Take incidental to a lawful activity may be authorized through the initiation of formal consultation if a Federal agency is involved; or if a Federal agency, Federal funding, or a Federal permit are not involved in the project, an incidental take permit pursuant to section 10(a)(1)(B) of the ESA may be obtained upon completion of a satisfactory habitat conservation plan for the listed species. However, there is no mechanism for authorizing incidental take "after-the-fact."

The proposed project lies within the range of the **Indiana bat** (*Myotis sodalis*), a Federally listed endangered species. Since first listed as endangered in 1967, their population has declined by nearly 60%. Several factors have contributed to the decline of the Indiana bat, including the loss and degradation of suitable hibernacula, human disturbance during hibernation, pesticides, and the loss and degradation of forested habitat, particularly stands of large, mature trees. Fragmentation of forest habitat may also contribute to declines. During the winter Indiana bats hibernate in caves and abandoned mines. Summer habitat requirements for the species are not well defined but the following are considered important:

1. Dead or live trees and snags with peeling or exfoliating bark, split tree trunk and/or branches, or cavities, which may be used as maternity roost areas.
2. Live trees (such as shagbark hickory and oaks) which have exfoliating bark.
3. Stream corridors, riparian areas, and upland woodlots which provide forage sites.

Mist Net Surveys: Based on ODNR's "On-Shore Bird and Bat Pre- and Post-Construction Monitoring Protocol for Commercial Wind Energy Facilities in Ohio", a total of 15 mist net surveys have been requested for the proposed project boundary. We understand surveys were conducted July 6- July 29, 2009. During these surveys 6 species and a total of 399 individual bats were captured over 120 net nights. Species included 160 big brown (*Eptesicus fuscus*), 62 northern long-eared (*Myotis septentrionalis*), 29 eastern red (*Lasiurus borealis*), 133 little brown (*Myotis lucifugus*), 10 hoary (*Lasiurus cinereus*), and 3 tri-colored (*Perimyotis subflavus*) bats. While no Indiana bats were captured during surveys for this project, several surveys conducted in Seneca and Crawford Counties in 2011 did capture Indiana bats.

Based upon the proximity of this project to those capture sites, the Service believes that take of Indiana bats from the proposed project is likely to occur during the maternity season. In addition, based upon several documented Indiana bat mortalities during the fall migration season, the Service also believes there is potential for take during the spring and fall migration season. Therefore, as discussed during the meeting on September 27, 2012 meeting, the Service recommends that if this project proposes to move forward, the developer complete a Habitat Conservation Plan (HCP), either individually or as part of the Regional HCP effort, and obtain an associated Incidental Take Permit.

The proposed project lies within the range of the **rayed bean** (*Villosa fabalis*), a Federally listed endangered species. The rayed bean is generally known from smaller, headwater creeks, but records exist in larger rivers. They are usually found in or near shoal or riffle areas, and in the shallow, wave-washed areas of lakes. Substrates typically include gravel and sand, and they are often associated with, and buried under the roots of, vegetation, including water willow (*Justicia americana*) and water milfoil (*Myriophyllum* sp.). Should the proposed project directly or indirectly impact any of the habitat types described above, we recommend that a survey be conducted to determine the presence or probable absence of rayed bean mussels in the vicinity of the proposed site. Any survey should be designed and conducted in coordination with the Endangered Species Coordinator for this office.

BALD AND GOLDEN EAGLE COMMENTS:

Bald and golden eagles are included under the Migratory Bird Treaty Act, but are afforded additional legal protection under the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d). The Service recently issued a final rule that authorizes issuance of eagle take permits, where the take to be authorized is associated with otherwise lawful activities. If take of bald eagles is likely, based on the best information available, a bald eagle take permit for this project will be necessary. Raptor nest searches and nest monitoring should be conducted in accordance with ODNR's survey protocols to identify any raptors, including bald eagles that may nest in or near the project area. In addition, the Service has produced Draft Eagle Conservation Plan Guidance (2011; ECP Guidance). The full text of Service guidelines and recommendations are available at the following web address: [Draft Eagle Conservation Plan Guidance \(2011\): http://www.fws.gov/windenergy/docs/ECP_draft_guidance_2_10_final_clean_omb.pdf](http://www.fws.gov/windenergy/docs/ECP_draft_guidance_2_10_final_clean_omb.pdf)

There are 16 bald eagle nests within 10 miles of the project boundary in Seneca County. These nests are within the perimeter that is outlined in Appendix C of the ECP Guidance. Based on this information, we have determined that ½ the inter-nest distance (defined in the ECP Guidance) for this project is 1.87 miles. The Service recommended all nests within 1.87 miles of this project boundary be monitored as well as eagle use of the project areas be assessed to determine if there is potential risk to eagles from the proposed project. The ECP Guidance suggests a way to estimate relative abundance and eagle exposure rates, characterization of the project area nesting population, and eagle migration and concentration areas. The Service has developed a model to predict risk to eagles from wind turbine facilities. Based upon the site specific information collected for this project the model predicts the take of 0.37 bald eagles per year, or approximately one eagle every three years. Therefore, the Service would recommend Exelon obtain take coverage through either an eagle take permit or incorporating eagles as a covered species within a HCP.

COORDINATION OF SURVEY RESULTS:

Please submit survey results to this office for review. Survey results will be interpreted to determine areas with relatively low bat and bird activity and diversity as opposed to areas with relatively high bat and bird activity and diversity. Based on the survey results, we may make recommendations as to turbine



placement and operation; additional consultation under Section 7 or 10 of the Endangered Species Act of 1973, as amended, additional permits under the Bald and Golden Eagle Protection Act, or pre- or post-construction monitoring.

POST CONSTRUCTION MONITORING:

The Service recommends the project be monitored post-construction to determine impacts to migratory birds and bats. A specific post-construction monitoring plan should be prepared and reviewed by the Service and should include a scientifically robust, peer reviewed methodology of mortality surveys. We recommend that the post-construction monitoring protocol be developed based on the results of pre-construction monitoring, and look forward to working with the project proponent to develop this document.

Thank you for the opportunity to provide comments on this proposed project. If you have questions, or if we may be of further assistance in this matter, please contact Keith Lott at extension 31 in this office or by email at Keith_Lott@fws.gov or visit our website at <http://www.fws.gov/midwest/Ohio>.

Sincerely,


 Mary Knapp, Ph.D.
Supervisor

Cc: Ms. Jennifer Norris, ODNR, Columbus, OH
Mr. Stuart Siegfried, OPSB, Columbus, OH

Appendix M-5: ODNR Survey Effort Letter 2/25/09



Ohio Department of Natural Resources

TED STRICKLAND, GOVERNOR

SEAN D. LOGAN, DIRECTOR

Division of Wildlife
David M. Graham, Chief
2045 Morse Rd., Bldg. G
Columbus, OH 43229-6693
Phone: (614) 265-6300

February 25, 2009

To all interested parties,

Though this project area encompasses both portions of Honey Creek, which has previously been identified as a potential migratory corridor, and part of Sandusky River Audubon Important Bird Area, the habitat within the proposed project would not be what the Ohio Department of Natural Resources Division of Wildlife (DOW) considers high quality stopover habitat. Based upon the project area map provided and the site visit conducted on 2/17/09, the DOW has determined that this proposed facility would be classified as a “moderate” site under the current monitoring protocols.

The table below was created based upon the project maps provided and summarizes the types and level of effort recommended by the DOW. Results from these studies will help the Department of Natural Resources assess the potential impact these turbines may pose, and influence our recommendations to the Ohio Power Siting Board. Monitoring should follow those criteria listed within the “On-shore Bird and Bat Pre-Construction Monitoring Protocol for Commercial Wind Energy Facilities in Ohio.”

Project	
Survey type	Seneca County
Breeding bird	Breeding bird surveys should be conducted at all sites. The number of survey points may be based on the amount of available habitat, or twice the maximum number of turbines proposed for the site. Because agricultural land is not considered to be suitable nesting habitat for most species of bird, turbines placed within these types of habitat are exempt of this recommendation.
Raptor nest searches	Nest searches should occur on, and within a 1-mile buffer of the proposed facility.
Raptor nest monitoring	Based upon the revised project boundaries (updated 2/25/09) there are 5 eagle nests located within 2 miles of the proposed project. One nest was found to be active during the site visit; the status of the remaining 4 is unknown. These pairs should be monitored to assess their daily movement patterns.
Bat acoustic monitoring	Acoustic monitoring should be conducted at all

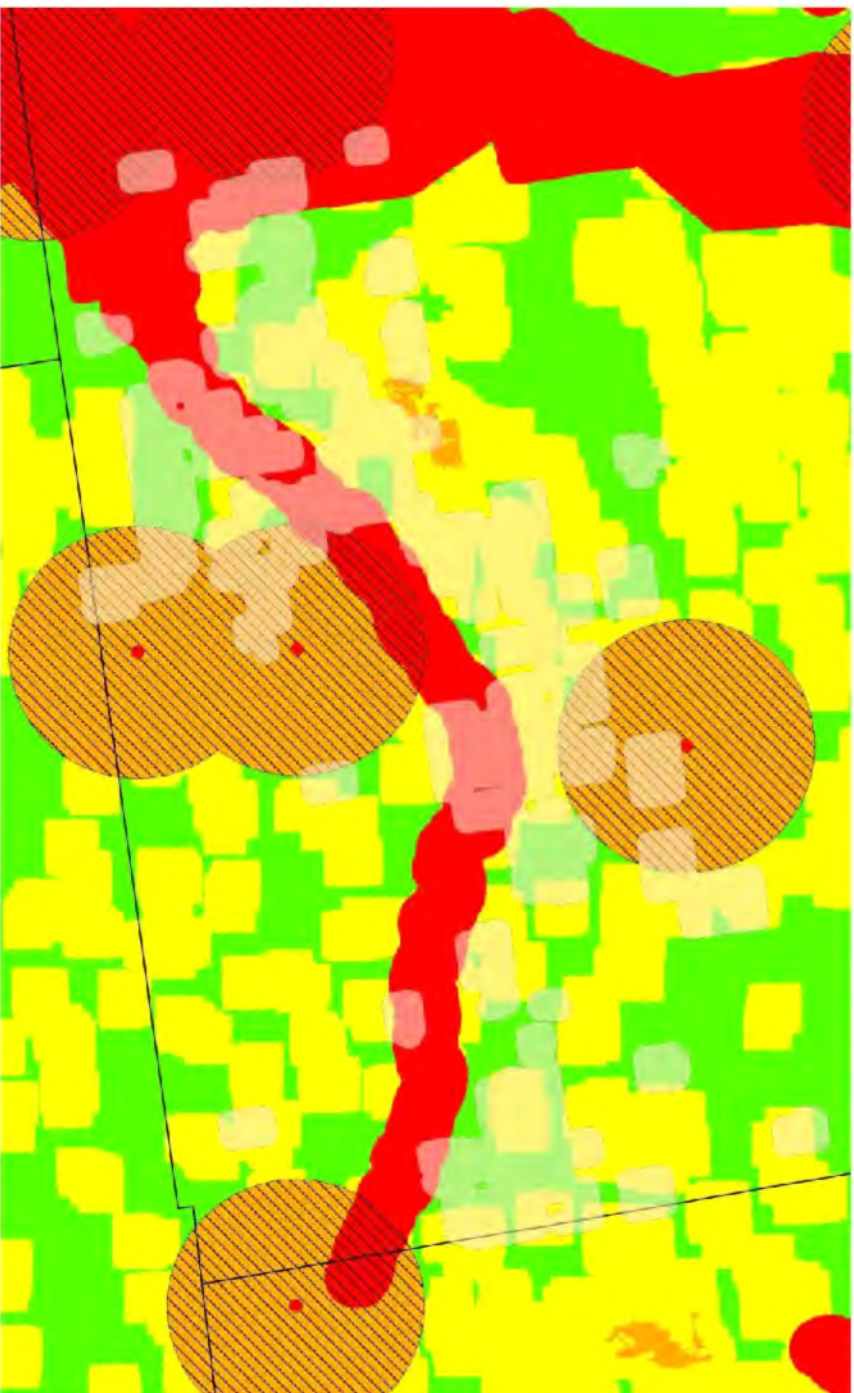
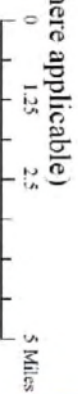
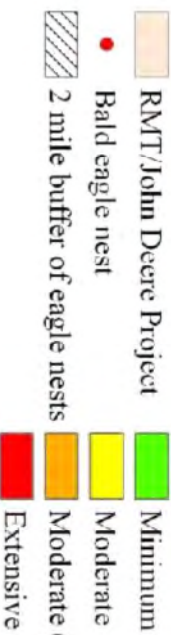
	meteorological towers.
Passerine migration (# of survey points)	15
Diurnal bird/raptor migration (# of survey point)	2
Sandhill crane migration (same points as raptor migration)	NS
Owl playback survey points	NS
Barn owl surveys	NS
Bat mist-netting (# of survey points)	15
Nocturnal marsh bird survey points	NS
Waterfowl survey points	NS
Shorebird migration points	NS
Radar monitoring locations	NS

NS = Not required based on the lack of suitable habitat.

The DNR looks forward to working with you in the future, and thanks you for contacting us early in the process. If you have any questions, please feel free to contact me.

Keith

cc: Mr. Stuart Siegfried, Ohio Power Siting Board
Ms. Megan Seymour, United States Fish and Wildlife Service



Appendix M-6: USFWS Project Review Letter 7/3/08



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
6950 Americana Parkway, Suite H
Reynoldsburg, Ohio 43068-4127
(614) 469-6923 voice
(614) 469-6919 fax

FILE COPY

July 3, 2008

Ms. Megan Martiny
RMT
PO Box 8923
Madison, WI 53708-8923

TAILS# 31420-2008-TA-0762

Dear Ms. Martiny:

This is in response to your letter, dated May 23, 2008, requesting our review of a proposed wind farm, including turbines, access roads, and interconnection lines, in Seneca County, Ohio. The project, proposed by John Deere Renewables, is proposed to be located within an approximately 90-square mile area in the northeast portion of the county, near the borders of Sandusky and Huron Counties. The number of turbines and the location of turbines has not been determined yet. The project area is typically rural and agricultural, with scattered blocks of wildlife habitat often comprised of privately-held woodlots, small streams, and wetland areas.

These comments are being provided pursuant to the Endangered Species Act (ESA), Migratory Bird Treaty Act, Bald and Golden Eagle Protection Act, and Fish and Wildlife Act of 1956. This information is being provided to assist you in making an informed decision regarding wildlife issues, site selection, project design, and compliance with applicable laws. The Service has been working closely with the Ohio Department of Natural Resources (ODNR) Division of Wildlife to develop recommended survey protocols and site evaluations that will satisfy both state and federal wildlife statutes, and this letter describes these measures, in part. We strongly recommend that you contact Keith Lott, ODNR (419-433-4601), and solicit review of the project by ODNR, and ensure that the project adheres to ODNR's Draft On-Shore Bird and Bat Pre- and Post-Construction Monitoring Protocol for Commercial Wind Energy Facilities in Ohio.

The Fish and Wildlife Service (Service) supports the development of wind power as an alternative energy source, however, wind farms can have negative impacts on wildlife and their habitats if not sited and designed with potential wildlife and habitat impacts in mind. Selection of the best sites for turbine placement is enhanced by ruling out sites with known, high concentrations of birds and/or bats passing within the rotoswept area of the turbines or where the effects of habitat fragmentation will be detrimental. In support of wind power generation as a wildlife-friendly, renewable source of power, development sites with comparatively low bird, bat and other wildlife values, would be preferable and would have relatively lower impacts on wildlife.

WATER RESOURCE COMMENTS:

The Service recommends that impacts to streams and wetlands be avoided, and buffers surrounding these systems be preserved. Streams and wetlands provide valuable habitat for fish and wildlife resources, and the filtering capacity of wetlands helps to improve water quality. Naturally vegetated buffers surrounding

these systems are also important in preserving their wildlife-habitat and water quality-enhancement properties. Furthermore, forested riparian systems (wooded areas adjacent to streams) provide important stopover habitat for birds migrating through the region. The proposed activities do not constitute a water-dependent activity, as described in the Section 404(b)(1) guidelines, 40 CFR 230.10. Therefore, practicable alternatives that do not impact aquatic sites are presumed to be available, unless clearly demonstrated otherwise. Therefore, before applying for a Section 404 permit, the client should closely evaluate all project alternatives that do not affect streams or wetlands, and if possible, select an alternative that avoids impacts to the aquatic resource. If water resources will be impacted, the Buffalo District of the Corps of Engineers should be contacted for possible need of a Section 404 permit.

ENDANGERED SPECIES COMMENTS:

Because of the potential for wind power projects to impact endangered bird, bat, or other listed species, they are subject to the Endangered Species Act (16 U.S.C. 1531-1544) section 9 provisions governing "take", similar to any other development project. Take incidental to a lawful activity may be authorized through the initiation of formal consultation, if a Federal agency, is involved; or if a Federal agency, Federal funding, or a Federal permit are not involved in the project, an incidental take permit pursuant to section 10(a)(1)(B) of the ESA may be obtained upon completion of a satisfactory habitat conservation plan for the listed species. However, there is no mechanism for authorizing incidental take "after-the-fact."

The proposed project lies within the range of the **Indiana bat** (*Myotis sodalis*), a Federally-listed endangered species. Since first listed as endangered in 1967, their population has declined by nearly 60%. Several factors have contributed to the decline of the Indiana bat, including the loss and degradation of suitable hibernacula, human disturbance during hibernation, pesticides, and the loss and degradation of forested habitat, particularly stands of large, mature trees. Fragmentation of forest habitat may also contribute to declines. During the winter Indiana bats hibernate in caves and abandoned mines. Summer habitat requirements for the species are not well defined but the following are considered important:

1. Dead or live trees and snags with peeling or exfoliating bark, split tree trunk and/or branches, or cavities, which may be used as maternity roost areas.
2. Live trees (such as shagbark hickory and oaks) which have exfoliating bark.
3. Stream corridors, riparian areas, and upland woodlots which provide forage sites.

The Service currently has no records for Indiana bats within Seneca County, however this is generally due to an absence of survey data for this area. Suitable summer and possibly hibernation habitat exists within the project area. Additionally, wind power developments within Pennsylvania and West Virginia are known to cause take of relatively large numbers of bats (no Indiana bats to date). Therefore further assessment of the bat community within the project area is warranted to determine if take of Indiana bats (or other bat species) is likely to occur.

Potential hibernacula: One large cave area is known to occur within the project area (Seneca Caverns), and additionally, data from ODNR indicate that karst features are found throughout the project area, but in particular in the northern project area. Seneca Caverns is a park and tourism area that has been modified and its ability to support hibernating bats is questionable. We recommend that the project area be fully evaluated to document any caves/fissures/openings. ODNR's Division of Geological Survey may be helpful in identifying the location of potential caves. Each cave/fissure/opening discovered

during project planning activities should be examined to determine if the features of the area indicate that they are potential hibernation sites for bats. The attached document, "Criteria for Determining if Caves or Abandoned Underground Mines are Potential Hibernacula for the Indiana Bat," provides a bulleted list of the criteria necessary for an area to qualify as a potential hibernaculum, and Service biologists would appreciate the opportunity to visit and evaluate the caves/karst areas within the project area. If any area(s) is determined to be a potential hibernaculum, it should be surveyed in one of two ways: 1) if the potential hibernaculum is safely accessible by human beings, it should be surveyed during the winter to document the presence/absence of hibernating bats of any species, as well as species composition; or 2) if human access is not possible or safe, any area determined to be a potential hibernaculum should be subject to a fall swarming survey between August 1 and September 30 to determine if bats of any species are using the area for swarming or hibernation.

Mist Net Surveys: We request that the extent of forested habitat that supports water features be quantified within the project area. Based on the extent of forested habitat, we recommend that mist net surveys be conducted to document the presence or likely absence of Indiana bats within the project area. Mist net surveys may only be conducted by permitted individuals from the attached list, and must follow standard protocol. The Service's Indiana bat Mist Netting Guidelines (attached) call for two net sites per square km of forested habitat. Particular attention should be given to any woodlots greater than 100 acres in size that support a perennial water source. Service biologists would appreciate the opportunity to visit the project area and to aid in selection of suitable mist net survey locations. Mist net surveys should follow standard Service protocol, as described in the attached document. Mist net surveys should occur between June 15 and July 31 to detect maternity colonies inhabiting the area, as well as to maximize opportunities to detect species diversity. Bat detectors should also be used in conjunction with mist net surveys to maximize detection of species diversity. If an Indiana bat is captured, this office shall be notified within 24 hours, or by the next business day.

Radio Transmitters: Up to four Indiana bats should be fitted with radio transmitters and tracked to roost site(s) and foraging areas until daily activity patterns are fairly well established, or as long as the transmitter remains attached and activated. Preference shall be given to tracking female bats, though one male Indiana bat may be tracked if captured prior to capturing four female Indiana bats. Please see ODNR's recommended survey protocol for additional information on radiotracking non-Indiana bats.

Acoustic Surveys: Acoustic surveys using bat detectors should be completed in conjunction with all mist net and fall swarming surveys, and should be placed on all meteorological towers, as recommended in ODNR's Draft On-Shore Bird and Bat Pre- and Post-Construction Monitoring Protocol for Commercial Wind Energy Facilities in Ohio.

Coordination of Survey Results: Please submit survey results to this office for review. If an Indiana bat is captured, this office must be notified within 24 hours, or by the next business day. Survey results will be interpreted to determine areas with relatively low bat activity/diversity as opposed to areas with relatively high bat activity/diversity. Based on the survey results, we may make recommendations as to turbine placement and operation, additional consultation under Section 7 or 10 of the Endangered Species Act of 1973, as amended, or pre- or post-construction monitoring.

The project lies within the range of the **eastern massasauga** (*Sistrurus catenatus catenatus*), a docile rattlesnake that is declining throughout its national range and is currently a Federal Candidate species. The snake is currently listed as endangered by the State of Ohio. Your proactive efforts to conserve this species now may help avoid the need to list the species under the Endangered Species Act in the future. Due to their reclusive nature, we encourage early project coordination to avoid potential impacts to

massasaugas and their habitat. At a minimum, project evaluations should contain delineations of whether or not massasauga habitat occurs within project boundaries.

The massasauga is often found in or near wet areas, including wetlands, wet prairie, or nearby woodland or shrub edge habitat. This often includes dry goldenrod meadows with a mosaic of early successional woody species such as dogwood or multiflora rose. Wet habitat and nearby dry edges are utilized by the snakes, especially during the spring and fall. Dry upland areas up to 1.5 miles away are utilized during the summer, if available. For additional information on the eastern massasauga, including project management ideas, please visit the following website:

<http://www.fws.gov/midwest/Endangered/lists/candidat.html> or contact this office directly.

MIGRATORY BIRD COMMENTS:

The Migratory Bird Treaty Act (16 U.S.C. 703-712; MBTA) implements four treaties that provide for international protection of migratory birds. The MBTA prohibits taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Department of the Interior. Bald and golden eagles are afforded additional legal protection under the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d). Unlike the Endangered Species Act, neither the MBTA nor its implementing regulations at 50 CFR Part 21, provide for permitting of "incidental take" of migratory birds.

The Service's Office of Law Enforcement serves its mission to protect Federal trust wildlife species, in part, by actively monitoring industries known to negatively impact wildlife, and assessing their compliance with Federal law. These industries include oil/gas productions sites, cyanide heap/leach mining operations, industrial waste water sites, and wind power sites. There is no threshold as to the number of birds incidentally killed by wind power sites, or other industry, past which the Service will seek to initiate enforcement action. However, the Service is less likely to prioritize enforcement action against a site operator that is cooperative in seeking and implementing measures to mitigate takes of protected wildlife.

The Service and ODNR Division of Wildlife have worked together to develop a recommended bird survey protocol for wind turbine projects. Please refer to ODNR's Draft On-Shore Bird and Bat Pre- and Post-Construction Monitoring Protocol for Commercial Wind Energy Facilities in Ohio. Similar to the bat survey results, bird survey results will be interpreted to determine if potential risk to birds is relatively high or low in various portions of the project area. Based on survey results we may make recommendations as to turbine placement and operation, or pre- or post-construction monitoring.

Research into the actual causes of bat and bird collisions with wind turbines is limited. To assist Service field staffs in review of wind farm proposals, as well as aid wind energy companies in developing best practices for siting and monitoring of wind farms, the Service published *Interim Guidelines to Avoid and Minimize Wildlife Impacts from Wind Turbines* (2003). We encourage any company/licensee proposing a new wind farm to consider the following excerpted suggestions from the guidelines in an effort to minimize impacts to migratory birds and bats.

- 1) Pre-development evaluations of potential wind farm sites to be conducted by a team of Federal and/or State agency wildlife professions with no vested interest in potential sites;
- 2) Rank potential sites by risk to wildlife;
- 3) Avoid placing turbines in documented locations of federally-listed species;

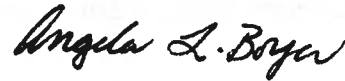
- 4) Avoid locating turbines in known bird flyways or migration pathways, or near areas of high bird concentrations (i.e., rookeries, leks, **refuges, riparian corridors**, etc.);
- 5) Avoid locating turbines near known bat hibernation, breeding, or maternity colonies, in migration corridors, or in flight paths between colonies and feeding areas;
- 6) Configure turbine arrays to avoid potential avian mortality where feasible. Implement storm water management practices that do not create attractions for birds, and maintain contiguous habitat for area-sensitive species;
- 7) Avoid fragmenting large, contiguous tracts of wildlife habitat;
- 8) Use tubular supports with pointed tops rather than lattice supports to minimize bird perching and nesting opportunities;
- 9) If taller turbines (top of rotorswept area is greater than 199 feet above ground level) require lights for aviation safety, the minimum amount of lighting specified by the Federal Aviation Administration (FAA) should be used. Unless otherwise requested by the FAA, only white strobe lights should be used at night, and should be of the minimum intensity and frequency of flashes allowable. Red lights should not be used, as they appear to attract night-migrating birds at a higher rate than white lights;
- 10) Adjust tower height to reduce risk of strikes in areas of high risk for wildlife.

The full text of the guidelines is available at <http://www.fws.gov/habitatconservation/wind.pdf>. The Service believes that implementing these guidelines may help reduce mortality caused by wind turbines. We encourage you to consider these guidelines in the planning and design of the project. We particularly encourage placement of turbines away from any large wetland, stream corridor, or wooded areas, including the areas mentioned previously, and avoid placing turbines between nearby habitat blocks.

BALD EAGLE COMMENTS: The project area lies within the range of the bald eagle (*Haliaeetus leucocephalus*). The bald eagle has been removed from the Federal list of endangered and threatened species due to recovery, but this species continues to be afforded protection by the Bald and Golden Eagle Protection Act, Migratory Bird Protection Act, and the State of Ohio. One active eagle nest exists within the center of the project area. Additionally, four more eagle nests are located within 5 miles of the project area. The proposed project location is of serious concern to the Service because multiple studies have documented the death of various species of eagles (golden eagles, white-tailed sea eagles, wedge-tailed eagles, and booted eagles) due to collisions with turbines in various locations throughout the world, including California (Thelander et. al 2003), Germany, Australia, and Spain (Lekuona, 2001). In order to minimize impacts to bald eagles as much as possible, surveys are necessary to document daily use patterns of adult and juvenile eagles within the project area, as described in ODNR's Draft On-Shore Bird and Bat Pre- and Post-Construction Monitoring Protocol for Commercial Wind Energy Facilities in Ohio. With such a large concentration of bald eagles within the greater project area we believe it is likely that eagles could be impacted if the project moves forward, and therefore additional studies of eagles within the project area are warranted to avoid and minimize any potential impacts.

Thank you for the opportunity to provide comments on the proposed John Deere Renewables Seneca County Wind Project. Please contact biologist Megan Seymour at extension 16 in this office if we can be of further assistance.

Sincerely,



for Mary Knapp, Ph.D.
Supervisor

Attachments: (1) Indiana bat mist netting guidelines
(2) Criteria for Determining if Caves or Abandoned Underground Mines are Potential Hibernacula for the Indiana Bat
(3) USFWS Permittees for Indiana bat surveys in Ohio

Cc: Mr. Keith Lott, ODNR, Old Woman Creek, 2514 Cleveland Road East, Huron, OH 44839
Mr. Dave Leput, Buffalo District, Corps of Engineers, Buffalo, NY
Mr. Brain Mitch, ODNR, REALM, Columbus, OH

Citations:

Lekuona, Jesus. 2001. Uso del Espacio del avifauna y control de la mortalidad de aves y murcielagos en los parques eolicos de Navarra durante un ciclo annual. Report prepared for the Government of Navarra, Spain.

Thelander, C.G., K.S. Smallwood, and L. Rugge. 2003. Bird Risk Behaviors and Fatalities at the Altamont Pass Wind Resource Area. Subcontractor report to the National Renewable Energy Laboratory, U.S. Department of Energy.

APPENDIX 5: Indiana Bat Mist-Netting Guidelines

RATIONALE

A typical mist-net survey is an attempt to determine presence or probable absence of the species; it does not provide sufficient data to determine population size or structure. Following these guidelines will standardize procedures for mist netting. It will help maximize the potential for capture of Indiana bats at a minimum acceptable level of effort. Although capture of bats confirms their presence, failure to catch bats does not absolutely confirm their absence. Netting effort as extensive as outlined below usually is sufficient to capture Indiana bats if they are present. However, there have been instances in which additional effort yielded detection when the standard effort did not.

Some mist-netting projects will require modification (or clarification) of these guidelines; these situations must be resolved through coordination with the Service Field Office responsible for the state in which your project occurs. Consultation with the Field Office is always recommended, particularly for large-scale netting efforts.

The Service accepts the results of these surveys to determine presence for the purposes of Section 7 consultation. Survey results are valid for at least two years.

NETTING SEASON: May 15 - August 15

May 15-August 15 are acceptable limits for documenting the presence of summer populations of Indiana bats, especially maternity colonies. (However, see Kiser and MacGregor 2005 for precautions regarding early-season surveys between May 15 and June 1, as well as late-season surveys between August 1 and August 15). Capture of reproductive adult females (i.e., pregnant, lactating, or post-lactating) and/or young of the year during May 15-August 15 indicates that a nursery colony is active in the area. Outside these dates, data cannot be used to document the presence or probable absence of summer populations.

EQUIPMENT

Mist nets to be used for Indiana bat surveys should be the finest, lowest visibility mesh commercially available: 1) In the past, this was 1 ply, 40 denier monofilament—denoted 40/1; 2) Currently, monofilament is not available, and the finest on the market is 2 ply, 50 denier nylon denoted 50/2; 3). The finest mesh size available is approximately 38 mm (~1 1/2 in).

No specific hardware is required. There are many suitable systems of ropes and/or poles to hold nets. The system of Gardner et al. (1989) has been widely used. See NET PLACEMENT below for minimum net heights, habitats, and other netting requirements that affect the choice of hardware.

NET PLACEMENT

Potential travel corridors such as streams or logging trails typically are the most effective places to net. Place nets approximately perpendicular across the corridor. Nets should fill the corridor from side to side and from stream (or ground) level up to the overhanging canopy. A typical set is 7 m high consisting of three or more nets stacked on top one another and up to 20 m wide. (Nets of different width may be used as the situation dictates).

Occasionally it may be desirable to net where there is no good corridor. Take caution to get nets up into the canopy. The typical equipment described in the section above may be inadequate for these situations, requiring innovation on the part of the researchers.

Exercise safety precautions when placing nets. Poles and nets must be clear of overhead wires.

See Kiser and MacGregor (2005) for additional discussion of net placement.

RECOMMENDED NET SITE SPACING

Stream and other linear corridors – one net site per km (0.6 mi) of stream or corridor.

Non-corridor study areas – two net sites per square km of habitat (equivalent to one net site per 123 acres).

The Service Field Office responsible for the state in which your project occurs should be consulted during survey design to resolve issues related to net site spacing for specific projects.

MINIMUM LEVEL OF EFFORT

Netting at each site should include at least four net nights, consisting of: 1) a minimum of two net locations at each site (at least 30 m apart, especially in linear habitat such as a stream corridor); and 2) a minimum of two nights of netting (i.e., two net locations for two nights = four net nights per site). A “net night” is defined as one net set up for one night. The sample period should begin at sunset and continue for at least 5 hours (longer sample periods may improve success). For purposes of determining presence or probable absence of Indiana bats, four net nights at a site are not required if Indiana bats are caught sooner (i.e., if Indiana bats are caught on the first night of netting, a second night is not required for purposes of documenting presence).

CHECKING NETS

Each net should be checked approximately every 10 minutes. Some researchers prefer continuous monitoring (with or without an electronic bat detector); care must be taken to avoid noise and movement near the nets if this technique is used. When monitoring the site continuously with a bat detector, bats can be detected immediately when they are captured in the net. Prompt removal from the net decreases stress on the bat and potential for the bat to escape (MacCarthy et al. 2006). Monitoring the net with a bat detector also allows the researcher to assess the effectiveness of their net placement (i.e., if bats are active near the nets but avoiding

capture); this may allow for adjustments that will increase netting success on subsequent nights. There should be no disturbance near the nets, other than to check nets and remove bats.

WEATHER AND LIGHT CONDITIONS

Severe weather adversely affects capture of bats. If Indiana bats are caught during weather extremes, it is probably because they are at the site and active despite inclement weather. On the other hand, if bats are not caught, it may be that bats are at the site but inactive due to the weather. Negative results combined with any of the following weather conditions throughout all or most of a sampling period are likely to require additional netting: 1) precipitation; 2) temperatures below 10°C; and/or 3) strong winds (use good judgment-- moving nets are more likely to be detected by bats). Further, consider human safety when netting during adverse weather.

It is typically best to set nets under the canopy where they are out of moonlight, particularly when the moon is ½-full or greater. Areas illuminated by artificial light sources should also be avoided.

DOCUMENTATION OF *MYOTIS SODALIS* CAPTURES

Photo documentation of *M. sodalis* captured during mist netting is not required, but is encouraged. Photos taken of a bat's head, calcar, tragus, toe hairs, etc. using a macro lens or a digital camera's macro-mode are often diagnostic and aid in validating the record.

If a bat from the genus *Myotis* is captured during mist netting that cannot be readily identified to the species level, species can be verified through fecal DNA analysis. Collect one or more fecal pellets (i.e., guano) from the bat in question by placing it temporarily in a holding bag (15 minutes is usually sufficient, no more than 30 minutes is recommended). The pellet (or pellets) collected should be placed in a 1.5 ml vial with silica gel desiccant; pellets from each individual bat should be stored in separate vials. Samples should be stored out of direct light. Samples should be shipped to Dr. Jan Zinck, Department of Biology, Portland State University, 630 SW Mill St., Portland, Oregon, 97201 for subsequent fecal DNA analysis to assign or confirm the specimens' identification to the species level. The current cost for sequencing is approximately \$50 per individual pellet of guano. Contact Dr. Zinck (e-mail: zinckj@pdx.edu) prior to shipping samples. To our knowledge, this is the only lab that currently provides this service. Any additional information (or additional sources) on this technique will be made available on the Indiana bat webpage on the Service's Region 3 website (www.fws.gov/midwest).

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Summary: Application Appendix L Part 4 and Appendix M electronically filed by Teresa Orahod on behalf of Dylan F. Borchers